

JUNE 25, 2021



FREIGHT CLUSTER PLAN

Best Practices Review

CONTENTS

Introduction	3
Freight in the Boulevard CID.....	3
Review of Studies, Plans, and Initiatives Representing Best Practices for Freight Cluster Planning	5
Safety, Congestion, and General Transportation Planning.....	5
Subregional Freight Movement Truck Access Study, 2004	5
State Highway 146 Subregional Study, 2018	6
City of Opa-locka Freight Implementation Plan	7
Miami River Freight Implementation Plan.....	9
The Town of Medley Freight Mobility Improvement Plan	10
South Fulton Community Improvement District Multimodal Study.....	11
Improving Truck Travel in the Everett-Chelsea Industrial Area	12
Truck Parking and Staging.....	13
Township of Upper Macungie Zoning Requirement for Truck Parking	13
National Coalition on Truck Parking.....	14
Regional and Statewide Truck Parking Studies with Implications for Local Planning	20
Land Use – Managing Conflicts.....	23
Maritime Industrial Zone Overlay District (MIZOD), Baltimore, MD	24
City of Chicago Industrial Corridor Program.....	24
Guild’s Lake Industrial Sanctuary Plan.....	26
Land Use – Electronic Commerce and Urban Infill.....	27
Truck Routing	28
O’Hare Subregion Truck Route Plan.....	29
Truck Route Plan for the City of Sharon.....	30
Technology and Data.....	30
Summary of Best Practices	32

TABLES

Table 1: Freight Technology Areas	30
---	----

FIGURES

Figure 1: Opa-locka Freight Implementation Truck Assignment.....	9
Figure 2: Miami River Freight Improvement Plan Study Area.....	10
Figure 3: Everett-Chelsea Industrial Area.....	13
Figure 4: Public Truck Parking in Elmira, NY.....	16
Figure 5: Dynamic Message Sign with Available Truck Parking.....	19
Figure 6: Trucks Parked on Roads Near an Industrial Area	22
Figure 7: City of Chicago Industrial Corridors	25
Figure 8: Examples of Demographic Factors Driving E-Commerce Growth	28

INTRODUCTION

The Boulevard Community Improvement District (CID) is undertaking a Freight Cluster Plan (FCP) to understand how the CID's transportation infrastructure is being used for the handling of freight. The purpose of the FCP is to address transportation planning, traffic operations, and related planning needs, and to identify and recommend projects and policy changes to address those needs. This technical memorandum provides a review of examples of freight planning efforts at the subregional level that have taken place across country. These studies will potentially provide insights and ideas that are useful to the Boulevard CID and the Metro Atlanta region as a whole.

The objective of the Best Practices Review is to examine existing notable practices in freight planning projects, literature, and data sets; assess the degree to which data, tools and processes in these efforts are available and meet the technical needs of this study; and recommend additional data collection and analysis to support subsequent tasks. The review covers topics including local freight planning methods, technology and transportation innovations that impact freight transportation, land use, and supply chain and logistics innovations that impact the transportation system. While the review features a more focused discussion on local freight planning methods and land use best practices, the discussion on innovative technologies and supply chain practices is woven throughout the document. A brief overview of technology applications is included in the review, but a more focused discussion on technology and transportation innovations (including logistics and supply chains) will be included in Task 4 (Inventory and Assessment) as part of the assessment of emerging freight trends.

The remainder of the document following this introduction, is organized into three sections. Section 2 provides an overview of the Boulevard CID as well as some of the key challenges faced by freight clusters. Section 3 presents a series of useful examples of freight planning at the freight cluster level. Using the information presented in section 3, section 4 identifies lessons-learned and best practices that may be applied to the Boulevard CID FCP and to future freight cluster planning initiatives.

FREIGHT IN THE BOULEVARD CID

The Boulevard CID is the largest industrial and business complex in the Atlanta region. It is a major contributor to the Atlanta regional economy and home to many of the major industrial and freight-intensive businesses that help create economic wealth for the region and jobs for thousands of residents. This was reflected in the Atlanta Regional Commission's 2016 Regional Freight Plan Update which identified the Boulevard CID as one of the region's major freight clusters.

Though it did not focus specifically on freight, the CID's 2013 Master Plan did make note of challenges faced by the CID as it pertains to freight. For instance, the 2013 Master Plan observed that changing economic conditions, shifts in global and regional manufacturing and distribution trends, and intensified competition had taken a toll on the preeminence of the Fulton Industrial area and its competitiveness for attracting industrial businesses. It also noted that two of the CID's main corridors, SR 70/Fulton Industrial Blvd. and SR 6/Camp Creek Pkwy., were characterized by high truck volumes with traffic projections indicating that those volumes would substantially increase over the long-term. The Master Plan also observed that those corridors had relatively high crash rates and experienced damage to medians, curbs, pavement, and other roadway components due to the prevalence of truck traffic.

In performing a review of best practices in freight planning, particularly at the cluster or sub-regional level, emphasis was placed on several common key challenges experienced by freight clusters. These include:

- **Truck Parking and Staging.** Truck parking challenges in freight clusters are typically driven by both long-term parking and short-term staging needs. Metro Atlanta has insufficient truck parking capacity for the volume of freight traffic originating in, destined for, and passing through the region. As a result, long-haul trucks making a pick-up or delivery in Metro Atlanta must find overnight parking at facilities at the boundaries of the region. The lack of overnight parking and the region's congestion contribute to short-term staging challenges in freight clusters. Without dedicated staging areas, trucks arriving early to their destinations must stage on streets, parking lots of nearby businesses, or other, potentially unauthorized areas that contribute to localized congestion and safety challenges.
 - **Safety.** In addition to being characterized by high truck volumes, the main corridors serving freight clusters also tend to carry even larger volumes of commuter traffic. As a result, these corridors often exhibit crash rates that exceed statewide averages for similar roadways. For corridors that must also serve transit and other roadway users, such as Fulton Industrial Boulevard, safety challenges are even more pronounced. As a result, safety is a common challenge for freight clusters and is a focus area of the best practices review.
 - **Multimodal Options.** The lack of multimodal transportation options is also a common challenge for freight clusters. As employment centers, freight clusters rely on multiple transportation modes for getting employees back and forth to work. Generally, increased prevalence and use of alternative transportation modes (e.g., transit, vanpools, biking, etc.) makes freight clusters more competitive as they can draw on a larger labor pool.
 - **Truck Routing.** The restriction of trucks on certain routes and their allowance on others impacts both motor carriers and the communities that are proximate to freight clusters. Restrictions on certain routes may result in operational inefficiencies for motor carriers and/or confusion for drivers. The allowance of trucks on other routes may expose surrounding communities to greater levels of noise, emissions, congestion, and other negative externalities. In addition, a lack of alternative routes capable of handling truck traffic limits the resilience of the freight network and hinders its ability to respond to incidents that limit network capacity, such as crashes at key access points. Steps that other freight clusters have taken to address truck routing challenges is therefore a focus of the review.
 - **Land Use Conflicts.** Industrial areas are often surrounded by residential communities and under constant pressure to redevelop away from heavy industrial use. Growth in and around these areas of mixed-use developments increase conflict points with residents, bicyclists, pedestrians, personal vehicle drivers, and transit. Conflicts with non-industrial activities often arise from issues related to noise from truck movements, idling, and commercial vehicle loading/unloading. Conflicts can also arise from issues related to roadways not designed to carry modern commercial vehicles. In these environments, it is not uncommon for trucks to strike signs, damage sidewalks, and block bicycle lanes, causing tension with non-industrial stakeholders. The best practices review investigates how other areas have addressed land use conflicts.
 - **Congestion.** Congestion on Interstate highways, major arterials, and on local streets due to growing volumes of commuter and freight traffic create a challenge for freight clusters. Commercial
-

vehicles must compete for limited space with pedestrians, bicyclists, transit, and other roadway users. Congestion is a negative externality for all roadway users, from the trucks and personal vehicles on the road caught in the congestion to the pedestrians walking alongside a backup of cars generating emissions. Congestion in dense commercial districts can also restrict the space for freight movement, limiting deliveries, pick-up times, turn radii, and access. These types of restricted or difficult environments can increase the potential for safety conflicts especially when the residential and commercial populations are increasing at the same time.

- **State of Good Repair.** Freight movements impact, and are impacted by, the state of repair of the highway system. A high volume of trucks operating on roadways accelerates pavement deterioration and causes other types of damage such as striking signs and street furniture or raising noise or vibration levels. However, trucks likewise suffer from poor roadway conditions as worn pavements cause increased fuel consumption, increased need for vehicle repair and maintenance costs, and can damage cargo. Deteriorating roadway conditions have a direct impact on transportation costs and economic vitality in a region and can lead to diminished ability to compete with other jurisdictions in business attraction and quality of life. Generally, federal and state funding levels have not kept up with the need for roadway and other asset repair and many jurisdictions are consistently behind in maintenance and preservation of their roadways.

REVIEW OF STUDIES, PLANS, AND INITIATIVES REPRESENTING BEST PRACTICES FOR FREIGHT CLUSTER PLANNING

This high-level review of best practices for freight cluster planning focuses on studies, plans, and initiatives conducted at the sub-regional level. While several states and metropolitan regions have conducted statewide and region-wide goods movement studies, far fewer agencies have conducted freight studies aimed specifically at sub-regions or freight clusters. By focusing on sub-regional initiatives, the review aims to identify those best practices that are directly applicable to the Boulevard CID.

Despite the review's focus on sub-regional initiatives, it does include best practices from regional and statewide studies that are relevant to the Boulevard CID. Specifically, in regard to truck parking and staging, there are examples of strategies identified as part of regional and statewide truck parking plans that may be applicable to the Boulevard CID. Those plans and their relevant components are highlighted in the best practices review.

Safety, Congestion, and General Transportation Planning

This set of examples focuses on safety, congestion, and other general transportation challenges experienced within freight clusters.

Subregional Freight Movement Truck Access Study, 2004

In 2004, the Southern California Association of Governments (SCAG) and the San Bernardino Associated Governments (SANBAG) undertook the Subregional Freight Movement Truck Access Study¹. The

¹ Southern California Association of Governments and San Bernardino Associated Governments, Subregional Freight Movement Truck Access Study, July 2004.

motivation for the study was the continued growth of the Inland Empire, particularly the western San Bernardino and Riverside County area, as a hub of warehouses, distribution centers, rail intermodal facilities, international airports with significant cargo operations, and other freight-intensive industries. The main goal of the study was to develop strategies and planning tools to improve the forecasting of goods movement and trucking trends and to better characterize truck access to intermodal facilities and truck activity centers in the Inland Empire. The Truck Access Study developed by SCAG and SANBAG can be described as consisting of three major technical tasks: (1) network usage and performance, (2) truck trip generation, and (3) stakeholder outreach. Those tasks are described in greater detail in the paragraphs that follow.

One of the primary components of the network usage and performance technical task was the compilation of existing truck volume data and the collection of new data where existing data sources were missing or out of date. The collection of volume data provided SCAG and SANBAG with a better understanding of network usage and how the highway system facilitates goods movement in the study region. Related to performance, SCAG and SANBAG concentrated on the number, rate, and severity of truck-involved crashes. Observing that incidents involving trucks typically result in larger highway closures and longer recovery times, the Truck Access Study treated the safety analysis as a key component for the mitigation of non-recurring congestion.

At the time of their study, the accuracy of methods for forecasting truck trip demand was a significant concern for SCAG and SANBAG. As a result, they conducted a review of local and national efforts for developing truck trip generation rates. These included methods previously developed by SCAG as well as national efforts such as the National Cooperative Highway Research Program Synthesis 298, which provided truck trip generation data from numerous cities across the nation.

The final major component of the Truck Access Study, stakeholder outreach, was used to support the truck trip generation rate task. Recognizing that the region was lacking in truck trip generation data and tools, SCAG and SANBAG conducted a shipper and motor carrier survey on truck travel patterns. The survey asked questions about the types of trucks being operated, their origins, destinations, type of cargo transported, and the frequency of trips. The results of the survey were used to develop detailed, local truck trip generation rates to support future modeling and forecasting efforts.

State Highway 146 Subregional Study, 2018

In September 2018, the Houston-Galveston Area Council (H-GAC) in partnership with the Texas Department of Transportation (TxDOT) released the State Highway 146 Subregional Study. The Study focused on the areas surrounding State Highway (SH) 146, an important regional corridor for freight and hurricane evacuation, in the Houston-Galveston metropolitan area. The study was motivated by the observation that these areas, namely the cities of Mont Belvieu and Baytown, have been experiencing rapid growth in terms of population, employment, traffic, and freight movements.

Though the SH 146 Subregional Study was not exclusively a freight study, the route is heavily traveled by trucks and the study contains many of the components important to effectively plan for freight at the subregional level. These include the collection of arterial and turning movement counts, an analysis of crash data, and intersection level-of-service analyses, among others. Furthermore, the large amount of industrial land uses within the study area along with the high percentage of truck traffic on area roadways made

freight a key consideration in the study's goals, objectives, and ultimately the recommendations. Both cities in the study area have large clusters of petrochemical facilities and other freight-intensive industries along SH 146 generating significant levels of truck traffic.

City of Opa-locka Freight Implementation Plan

District 6 of the Florida Department of Transportation (FDOT) encompasses Miami-Dade and Monroe Counties in South Florida, which is home to over 2.5 million people.² District 6 is also home to transportation assets that are critical to freight mobility at the regional, statewide, and in some cases the national level. These include gateways for international trade such as the Port of Miami ("PortMiami") and the Miami International Airport. With significant investments made to these facilities in order to compete globally for new cargo opportunities stemming from growing trade with South America and increased Asian trade through the Panama and Suez Canals, FDOT District 6 initiated a subarea freight plan program to support growth at these gateways. This program has resulted in seven separate sub-area freight plans that resulted in short- and long-term improvements designed to mitigate freight bottlenecks (e.g., access, capacity, operations, safety). Truck parking also was a key factor in all seven plans. The seven subareas consisted of industrial freight clusters home to manufacturing operations, warehouses, distribution centers, and freight terminals. FDOT determined that it was essential for each of these communities to identify and invest in infrastructure improvements to position themselves for economic development and growth in cargo. To meet this need, FDOT District 6 conducted subarea freight plans for the Town of Medley, City of Opa-locka, City of Doral, City of Miami Gardens, City of Hialeah, City of Homestead (ongoing), and the Miami River area. This case study focuses on the plan developed for the City of Opa-locka, with briefer treatments of the Miami River and Town of Medley plans following.

The goal of the Opa-locka Freight Implementation Plan was to investigate freight corridors within the Opa-locka area and develop a plan of viable improvements to enhance freight connectivity and minimize conflicts. The Opa-locka Freight Implementation Plan consisted of seven major tasks, all of which are generally applicable to conducting subregional freight planning. These include: (1) stakeholder outreach; (2) assessment of existing conditions; (3) programming, which included identifying performance measures and applying environmental screening; (4) mapping the condition of the subregion's freight infrastructure as well as identified needs; (5) performing an analysis of alternatives for improving the subregion's freight network; (6) developing project improvements and planning level cost estimates; and (7) developing a set of final recommendations.

Two notable practices employed as part of the Opa-locka Freight Implementation Plan were: (1) the use of alternative growth scenarios to evaluate freight movement on the subregion's highway system and the impact on performance; and (2) the division of the subregion into smaller subareas based on commonalities among the specific types of freight generating economic activities, such as warehousing, manufacturing, and transportation. The alternative scenarios represented the potential location of new warehousing or logistics space, and redevelopment opportunities. The scenarios developed as part of the Freight Implementation Plan were:

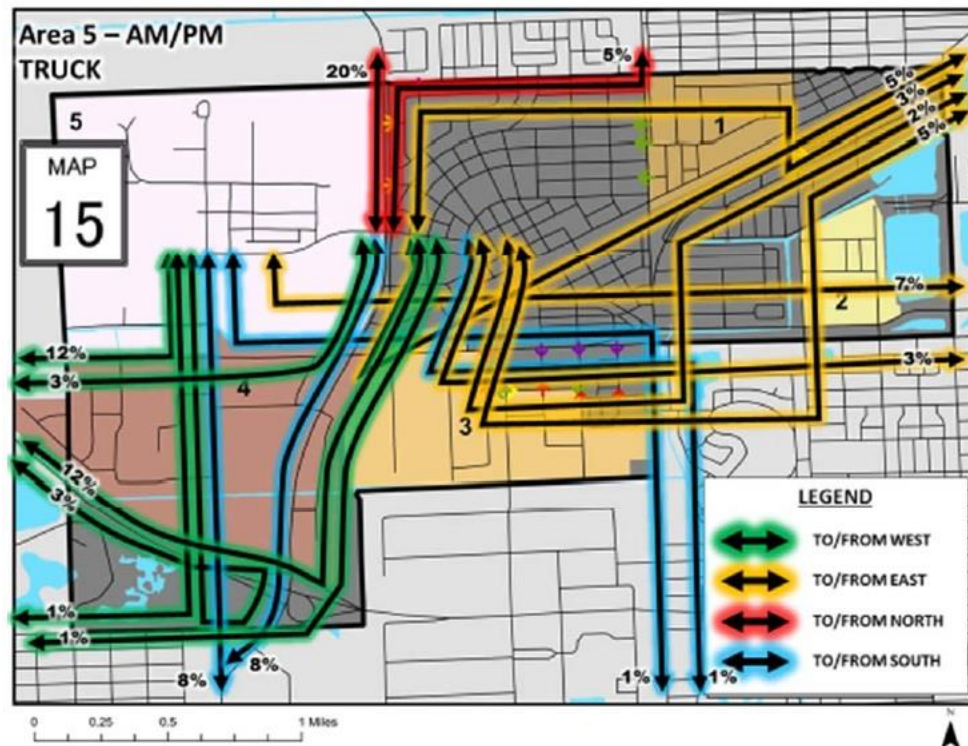
- Trend – Conditions continue as is, with new businesses building on the little remaining vacant land;

² <https://www.fdot.gov/agencyresources/districts/index.shtm>

- Moderate Growth – Additional freight traffic occurs beyond historic trends, potentially driven by increased freight demand at PortMiami;
- High Growth – Significant growth occurs in Opa-locka, particularly around the airport; and
- Most Likely – In this scenario, a potential development at the airport by Amazon comes to fruition.

The division of the subregion into a smaller set of subareas tied into the Freight Implementation Plan's scenario analysis. For each of the identified scenarios, traffic analyses were prepared to determine the number of new trips that would be produced. The rate and magnitude at which new trips would be generated were specifically tied to the subregion's subareas and their predominant land uses. In this manner, the Opa-locka Freight Implementation Plan was able to produce traffic forecasts tailored to each subarea and ultimately identify recommendations that considered the unique conditions and potential outcomes for each subarea. Figure 1 illustrates the truck trip assignment by direction.

Figure 1: Opa-locka Freight Implementation Truck Assignment



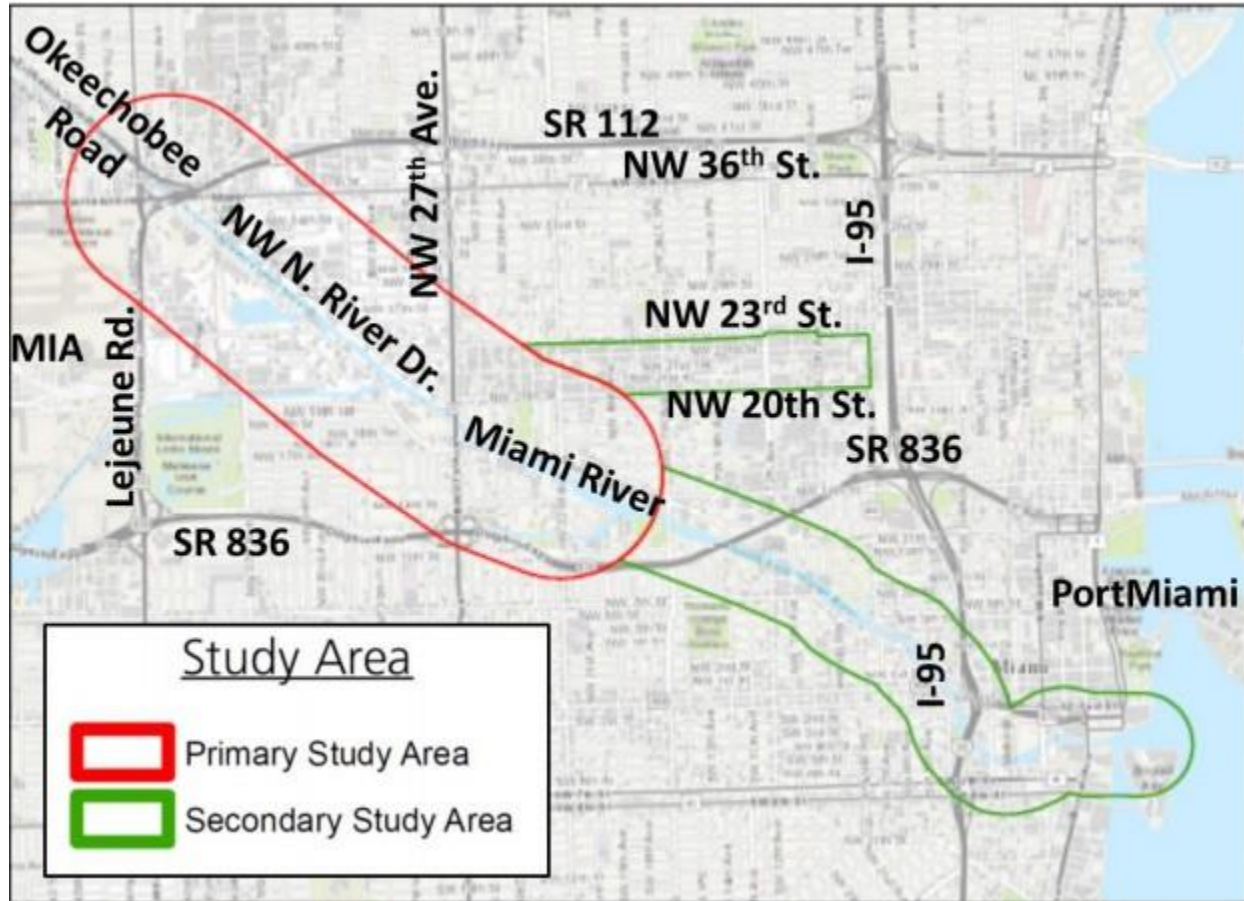
Source: Florida Department of Transportation, City of Opa-locka Freight Implementation Plan, 2017.

Miami River Freight Implementation Plan

The Miami River Freight Implementation Plan, produced by FDOT District 6, encompasses 5.5 miles of the Miami River, which falls within portions of the City of Miami and unincorporated Miami-Dade County in Florida. This marine corridor is essential to the marine shipping industry in the area. Surrounded land uses include shipping terminals, logistics hubs and existing railroad and street network access. The Plan provides a framework to preserve marine industrial land uses while enhancing connectivity between existing infrastructure and the regional network. Key objectives for the study included inventorying existing and future mobility issues, evaluating capacity, assessing the potential for short sea shipping, mitigating traffic congestion and safety issues, and identifying a prioritized list of improvement projects for marine logistics. The Plan provided short-, medium- and longer-term project improvements and a set of policy recommendations to enhance freight movement along the Miami River.³ Figure 2 illustrates the study area.

³ https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/rail/publications/d6/miami-river-freight-study-final-fact-sheet_march2018.pdf?sfvrsn=d0fee5fe_2

Figure 2: Miami River Freight Improvement Plan Study Area



Source: Florida Department of Transportation, Miami River Freight Improvement Plan, Presentation to the Miami-Dade TPO Freight Advisory Committee, November 8, 2017.

The Town of Medley Freight Mobility Improvement Plan

The purpose of the Town of Medley Freight Mobility Improvement Plan was to identify specific needs to support FDOT's vision of becoming a global hub. The study objective was to investigate the freight corridors and industrial land uses within the study area, develop a plan of alternatives to enhance freight connectivity and minimize conflicts, and analyze alternatives through existing conditions findings, and collected stakeholder input. Stakeholder comments reflected common themes of freight mobility related to safety and connectivity. At the conclusion of the report, the locally preferred project recommendations identified a potential funding source and were screened under the Department's efficient transportation decision making (EDTM) process, which is used to review environmental impacts of proposed transportation projects.⁴

⁴ https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/rail/publications/d6/medley-freight-study-final-report_june2017.pdf?sfvrsn=2ae36de5_2

South Fulton Community Improvement District Multimodal Study

Over the November 2016 to March 2018 time period, the South Fulton Community Improvement District (CID) conducted a Multimodal Transportation Study to understand how the CID's transportation infrastructure is being used to handle freight and to support local resident and commuter mobility. The South Fulton CID, located primarily along the I-85 and Oakley Industrial Boulevard corridors, is experiencing substantial growth as a result of significant warehousing and distribution center development and resulting increases in freight movements to, from, and within the area. Much of this new development can be traced to the construction of the Fairburn CSX Intermodal Center, completed in 1999, which created a high-volume rail corridor connection for intermodal service between southern California ports, Atlanta, and the rest of the southeast region. While ancillary logistics, warehousing, and transportation jobs and investment have flourished, congestion and access issues for both freight and passenger movements in the area have also increased.

The purpose of the Multimodal Transportation Study was to develop and prioritize a strategic set of transportation solutions within the study area to address both short and long-term investment needs. Though the Multimodal Transportation Study was not exclusively a freight study, the South Fulton CID is characterized by the large cluster of freight-intensive land uses contained within its boundaries and also by large volumes of heavy truck traffic generated by area industries. In addition, the ARC designated the broader area that encompasses the South Fulton CID a regional freight cluster. Thus, the Multimodal Study can be viewed as a subregional freight plan.

To address the complex mobility challenges in the study area, the Multimodal Transportation Study was guided by a technical approach that considered multimodal system performance (both current and projected), system conditions, and evolving land use and development trends. The analysis included a detailed assessment of the following:

- An assessment of existing and projected roadway congestion;
- A detailed crash analysis based on geo-located crash data from the last five years;
- A network and asset-level pavement and bridge conditions assessment;
- An evaluation of roadway operations and design;
- A multimodal gap analysis for bicycle, pedestrian, and transit infrastructure; and
- A detailed analysis of existing and projected land use and development trends to identify potential areas of opportunity or conflict between proposed transportation investment and planned land use.

In addition to the technical analysis, targeted stakeholder input was gathered throughout the study to calibrate technical findings against local realities and ensure a comprehensive perspective on investment needs. This integrated process directly informed the identification and prioritization of projects and policies for the study area, as reflected in final study recommendations.

A notable component of the Multimodal Transportation Study was the land use analysis which included a stakeholder workshop and build-out analysis. The purpose of the workshop was to bring awareness of existing and projected transportation and land use conditions to a broader set of project stakeholders and provide an understanding of the impacts that land use decisions have on transportation system performance. The South Fulton CID viewed dialogue around the transportation/land use dynamic as important for stakeholders to make informed positions on the challenges, opportunities, and desired

investment strategies to enable the CID's future growth and development. The stakeholder land use workshop was informed by the results of the build-out analysis, which painted a picture of what the study area would look like if all developable land was consumed according to plans and policies for future development as articulated through approved Developments of Regional Impact (DRIs), ARC's Unified Growth Policy Map and local comprehensive plans.

Improving Truck Travel in the Everett-Chelsea Industrial Area

The cities of Everett and Chelsea, MA have a large number of industrial areas along the northern portion of Boston's inner harbor. Industrial infrastructure is balanced between the western boundary of the city of Everett and the eastern boundary of the city of Chelsea, with significant truck access routes along the adjacent rivers. This area is transforming to include new and modernized industrial and nonindustrial development. The goal of the study was to identify modifications to the existing roadway network that would support investment in both types of land use. The study characterized eight distinct truck types and evaluated improvements to the roadway network suggested by stakeholders based on their ability to impact truck traffic, truck uses and corridor freight volumes. Detailed observations of transportation services supporting commerce within the study area led to the proposal of network improvements designed to help industrial and nonindustrial businesses, pedestrian mobility, and nearby residential areas to create a successful development plan for the future.⁵ Figure 3 illustrates the study area, its key roadway network, and the location of proposed improvements.

⁵ https://www.ctps.org/data/calendar/pdfs/2016/MPO_0121_Freight_Memo.pdf

Figure 3: Everett-Chelsea Industrial Area



Source: Boston Region Metropolitan Planning Organization, Improving Truck Travel in the Everett-Chelsea Industrial Area, Technical Memorandum, January 21, 2016.

Truck Parking and Staging

Trucks parking in and near industrial, warehousing, and commercial facilities pose a challenge throughout the U.S. The truck parking challenges experienced by freight clusters speak to the need to develop zoning or site development standards to help local municipalities plan for the increase in truck parking brought on by specific types of development. This portion of the best practices review highlights a few efforts to increase the supply and improve the utilization of truck parking.

Township of Upper Macungie Zoning Requirement for Truck Parking

In 2017, the Township of Upper Macungie in the Lehigh Valley region of Pennsylvania passed a new zoning requirement which requires one off-street truck parking space for every loading dock at a new warehouse or distribution facility.⁶ Lehigh Valley is the freight distribution hub of the Northeast and growth in warehousing and associated truck traffic has been substantial. The new zoning regulation also mandated one truck staging space (with 10-feet x 80-feet dimensions) for every two loading spaces at a distribution center or warehouse facility.⁷ The new zoning requirements specify that “the applicant shall present credible

⁶ Township of Upper Macungie Municipal Code § 27-605. <https://ecode360.com/14517379>.

⁷ Township of Upper Macungie Municipal Code § 27-601. <https://ecode360.com/14517379>.

evidence that the number of “oversized” off-street parking spaces provided for trucks will be adequate to accommodate the expected demand generated by the warehouse activities.”

The ordinance does not define truck staging or specify the length of time a truck may stage or park. The ordinance requires staging spaces be provided in proportion to the number of loading spaces; this implies access to the staging spaces is limited to drivers currently waiting to engage in loading/unloading activities. However, the ordinance does not explicitly state these spaces cannot be used for longer-term parking.

These zoning requirements came after a culmination of events. Documented in the 2007 Upper Macungie Township Comprehensive Plan, community members expressed concern for truck traffic and the implications of growing clusters of warehouse/distribution uses.⁸ As a result, the Township established a Good Neighbor Coalition (GNC) in 2015 to address growing truck traffic issues and enhance the safety of traveling vehicles through collaborative action between freight providers, community members and law enforcement.⁹ In the same year, residents pushed back against development plans to build an Old Dominion Freight Line distribution warehouse facility on light industrial zoned land, stating that existing roadways did not have the capacity to accommodate the influx of truck volumes from the planned development. Furthermore, the Township conducted a traffic engineering study used to ban large vehicles from driving or parking on a series of roadways, to reduce traffic and protect traveling residents from traffic incidents caused by large trucks.

National Coalition on Truck Parking

The National Coalition on Truck Parking is a collection of stakeholders from the public sector, transportation organizations, the freight industry, and other groups to advance safe truck parking.¹⁰ An important initiative conducted by the Coalition was the development of Truck Parking Working Groups. The purpose of the working groups was to share best practices and create products to disseminate information on truck parking issues related to priorities identified by the Coalition. The working groups covered the following topics: parking capacity; technology and data; funding, finance, and regulations; and state, regional, and local government coordination. A summary of best practices identified by those working groups that are relevant to freight clusters are summarized below.

State, Regional, and Local Government Coordination

The State, Regional, and Local Government Coordination working group identified several examples of local governments including provisions for truck parking and staging in their local planning and zoning.¹¹ These plans and ordinances address staging, long-term parking, deliveries, and parking at home. These

⁸ Upper Macungie Township 2019 Comprehensive Plan: http://www.uppermac.org/wp-content/uploads/2017/10/UMT-Appendices-Combined-4-26-19_LowRes.pdf

⁹

<https://www.uppermac.org/police/trucksafety/#:~:text=In%20a%20continuing%20effort%20to,positive%20changes%20through%20collaborative%20action.>

¹⁰ https://ops.fhwa.dot.gov/freight/infrastructure/truck_parking/workinggroups/index.htm

¹¹

https://ops.fhwa.dot.gov/freight/infrastructure/truck_parking/workinggroups/state_reg_lgov_coord/product/requirements.pdf

examples could be considered as a model for freight clusters to address truck parking and staging challenges in coordination with their municipal partners.

- **Carson, California.** The City of Carson's Traffic Engineering Section noted that trucks and commercial vehicles are essential to the region, providing goods and services to the residents and businesses every day.¹² Furthermore, the City's diverse mixture of land uses, urban environment and vast transportation infrastructure requires a distinct set of rules and regulations to govern the operation of trucks and commercial vehicles on city streets. To this end, the City of Carson developed and codified citywide truck routes and truck parking areas. Trucks may park in designated areas for up to 72 hours and also use those areas to load/unload goods. The City also designated truck routes providing access to the truck parking areas from Interstate highways, state highways, and commercial zones in the city. The excerpt from the zoning code is as follows:

The parking of any commercial vehicle with a gross weight of over six thousand (6,000) pounds, length of over twenty-five (25) feet, or width of over ninety-six (96) inches (total outside width of vehicle or load or combined) is prohibited at all times on any street in the City of Carson except:

(a) At locations and for the time period authorized by the City Council and posted by the Public Works Director;

(b) For such time as is reasonably necessary to deliver or collect goods from or provide a service to a property in the block in which the vehicle is parked. At locations where parking of commercial vehicles with a gross weight of over six thousand (6,000) pounds is permitted overnight, illuminated clearance lights or safety reflectors must be provided and utilized.

- **Elmira, NY.** The City of Elmira created a municipal truck parking area from an existing industrial-zoned lot adjacent to a carpool parking lot near Interstate 86. The municipal lot provides capacity for about 25 trucks. The City charges \$5 per day and trucks can stay for up to thirty days. There appear to be no on-site amenities. However, the lot is adjacent to greenspace (including a park and multi-use trail) and proximate to a hotel (about ¼ mile). The working group noted that once the lot was created, complaints from residents in a nearby residential area about unauthorized truck parking decreased. Figure 4 illustrates the parking area.

¹² <http://ci.carson.ca.us/PublicWorks/truckroutes.aspx>

Figure 4: Public Truck Parking in Elmira, NY



Source: Google Earth.

- Weed, California.** The town of Weed, CA, located on Interstate 5 at the base of Mount Shasta, created a municipal truck parking lot with a capacity of 30 trucks using two pieces of city owned land zoned for industrial use. There are no amenities and trucks are permitted to park for no more than 72 hours. Despite the lack of amenities, the municipal lot is adjacent to commercial developments including restaurants, a motel, and a Pilot Travel Center commercial truck stop. The lot is limited to trucks as passenger vehicles, recreational vehicles, and other vehicles are not allowed to park in the lot.

The town of Weed, CA was motivated to provide truck parking based on complaints from drivers that were ticketed for parking in unauthorized areas proximate to the truck stop when it had reached its maximum capacity.¹³ Upon further investigation, the town concluded its location at the confluence of multiple freight corridors (i.e., U.S. 30, U.S. 97, and I-5) resulted in the town lacking sufficient truck parking capacity to meet demand. Furthermore, the town estimated that approximately 84 percent of its sales tax revenue was generated by truck drivers.

¹³ <https://www.fleetowner.com/resource-center/driver-management/article/21693795/truckers-love-weed-weed-loves-truckers>

Parking Capacity

The Parking Capacity working group explored alternative methods to increase truck parking capacity that may be a part of broader truck parking solutions for freight clusters. These alternative methods include involving shippers and receivers in providing capacity and creative uses of right-of-way (ROW) and adjacent areas.

Involving Shippers/Receivers to Address Truck Parking Capacity. The Parking Capacity working group noted that it is necessary for truck parking and staging to be considered at every stage of the supply chain. Furthermore, they observed that most truck parking capacity is provided by private businesses, namely travel centers, and is located proximate to Interstate highways. To increase the supply of truck parking in the U.S., other entities need to play a role – namely businesses that are the shippers and receivers of freight. Meijer Grocery Stores and Unilever were provided as examples of shippers/receivers contributing to the supply of truck parking.

- **Meijer Grocery Stores.** Meijer Grocery Stores incorporated truck parking into their distribution centers by allowing drivers that recently completed, or will soon make a delivery, to park in a designated “bullpen” area outside the distribution center. A bullpen is a fenced area located on the property of a business but not inside the gated area of the distribution facility. Being outside the actual distribution center limits liability for the company by separating parked trucks from trucks in the delivery area. Local police rather than Meijer respond to crashes that occur in the bullpen. Meijer usually provides Wi-Fi, a Port-o-John, and trash collection in the parking area.
- **Unilever.** Unilever partnered with Kriska Transportation Group to create the Safe Haven Program, which allows drivers to park onsite or immediately adjacent to their distribution centers both for staging purposes and overnight. Kriska’s dispatch assigns drivers to parking spots at the distribution centers. Drivers on site must follow specific safety measures, such as wearing safety vests at all times and carrying a flashlight at night. Due to the success of the pilot study, the Safe Haven Program was expanded to all of Unilever’s North American distribution centers and manufacturing plants.

Creative Uses of Right-of-Way and Adjacent Areas. One approach that some states have taken to increase the supply of truck parking is to use existing facilities in the ROW or adjacent to the ROW. Facility types where this has been implemented include rest areas, weigh stations, and tourism centers. Kentucky, Florida, Maryland, Missouri, and South Dakota are all states that have undertaken initiatives to expand truck parking capacity at rest areas and weigh stations. In some cases, such as Missouri and South Dakota, rest areas and weigh stations were converted to truck parking facilities. Though there are no rest areas or weigh stations within the Boulevard CID, there is a weigh station near the study area along I-20 between Mt. Vernon Rd. and Thornton Rd. in Lithia Springs where such an approach to expand truck parking capacity could be applied.

Funding, Finance, and Regulations

One topic explored by the Funding, Finance, and Regulations working group was the use of public-private partnerships (P3) to develop truck parking capacity. The working group recognized that there are opportunities to create P3 arrangements with travel center operators handling operations and maintenance of the publicly owned facility. However, travel center operators are usually concerned with liability and

maintenance costs should an agreement be entered into which creates a potential impediment to the development of truck parking P3s. To address this, the working group identified examples of truck parking P3s that may serve as models for non-traditional funding agreements to increase the supply of truck parking.

- **Wamsutter, Wyoming.** Using a Truck Parking Facilities (TPF) Program grant, Wyoming Department of Transportation (WYDOT) constructed 43 dedicated long-term truck parking spaces in a secure, lighted area right off Interstate 80 in Wamsutter, Wyoming. These spots were created adjacent to a truck stop with existing food and shelter. This project will alleviate negative economic impacts resulting from makeshift parking within the community of Wamsutter, as well as assist with previous issues that arose during weather-related highway closures.
- **Brainerd Lakes Area Welcome Center.** The Brainerd Lakes Area Welcome Center in Minnesota was funded through a P3 and is sited in the middle of the highway right of way. The center required special State legislation to create a unique P3 with the Brainerd Chamber, Crow Wing County, Minnesota DOT, Minnesota Department of Natural Resources, and Minnesota State Patrol. A gift shop featuring local products helps financially support the operating costs of the facility. The site provides separated, short-term truck parking, bathrooms, and vending machines. The site is operated as a rest area and has 30 truck parking spaces that are easily accessible from either direction of travel on the highway. Private gas station facilities are located approximately 15 miles from the site that offer additional services such as gas, food, and some commercial truck services.

Technology and Data

The Technology and Data working group led an initiative that investigated best practices related to Truck Parking Information Management Systems (TPIMS). These systems provide real-time information to truck drivers about available parking with the goal of maximizing the utilization of existing truck parking capacity. In general, these systems collect real-time parking information using various technologies for sensing and counting vehicles including closed circuit television, in-ground sensors, above-ground radar, and side laser scanners. This data is then sent to an information processing center to be converted into parking availability information, which is then disseminated to motor carriers – via in-cab systems, mobile applications or websites, and dynamic message signs to name a few – to inform them of parking availability.

Mid-America Association of State Transportation Officials (MAASTO) TPIMS Project. MAASTO is a coalition of Midwestern state DOTs with the goal of fostering the development, operation, and maintenance of an integrated and balanced transportation system that adequately serves the transportation needs of the ten member states. MAASTO received a \$25 million 2015 Transportation Investment Generating Economic Recovery (TIGER) grant from the Federal Highway Administration (FHWA) to develop and implement a regional TPIMS. The TPIMS involves the development of a coordinated truck parking management solution in the Midwest region. Means of detection and notification are uniquely defined within each MAASTO member state, but the information from each state is collected through standard extensible markup language (XML) feeds and shared through a common application programming interface (API) via dynamic message signs (DMS), traveler information websites, and a smart phone app. Figure 5 illustrates use of DMS to communicate available truck parking spaces.

Figure 5: Dynamic Message Sign with Available Truck Parking

Source: MAASTO, Regional Truck Parking Information and Management System, 2015 TIGER Proposal, <http://www.maasto.net/documents/TPIMS-Grant.pdf>.

Colorado DOT TPIMS. The Colorado DOT (CDOT) plans to implement TPIMS to communicate real-time parking availability to drivers. CDOT was awarded a 2016 Fostering Advancements in Shipping and Transportation for the Long-Term Achievement of National Efficiencies (FASTLANE) grant to partially fund the project with the remainder coming from other CDOT and federal sources. Using a combination of static cameras and sensors to monitor parking availability, CDOT collects information from public rest areas, private truck stops, and new parking facilities along I-25, I-70, and I-76. This information is incorporated into CDOT's advanced traffic management system (ATMS) and used to communicate real-time parking information to drivers via dynamic message signs (DMS), the CDOT website, smartphone apps, and the 511-travel information system. CDOT also developed a Truck Parking Guide to assist drivers in locating long-term, emergency, and chain-up parking. In addition, CDOT planned to align the project to be a compatible and complimentary extension of the MAASTO TPIMS approach.

Florida DOT TPAS. The Florida DOT's Truck Parking Availability System (TPAS) uses CCTV, microwave vehicle detection, and in-ground sensors in the truck spaces at interstate rest areas, welcome centers, and weigh stations to monitor the number of available truck parking spaces. That information is used to inform drivers of truck parking availability using the State's FL511 website and mobile application, third-party mobile applications, and roadside DMS. FDOT hopes to eventually expand to predictive analyses from the real-time data. FDOT has installed or begun installing TPAS along I-4, I-10, I-75, and I-95 with a total of 68 locations statewide.

Regional and Statewide Truck Parking Studies with Implications for Local Planning
Several regional and statewide truck parking studies have been conducted in recent years that have implications for the truck parking challenges experienced by freight clusters. Most relevant to the Boulevard CID is the Atlanta Regional Commission's 2018 Truck Parking Study. The Truck Parking Study was motivated by the recognition that Metro Atlanta lacks truck parking facilities, and that the region should better understand freight mobility issues centered on the lack of truck parking capacity. It also was motivated by then-impending federal regulation for electronic logging devices to digitally monitor truck driver hours of service. This meant hours for truck drivers would be more closely monitored, and the need for truck parking would increase to give drivers improved opportunities to meet the regulations.

Some key findings from the 2018 ARC Truck Parking Study with implications for the Boulevard CID include:

- A general lack of truck parking supply that will worsen as truck volumes increase;
- A localized lack of truck parking around the region's perimeter (i.e., I-285);
- The federal requirement for electronic logging devices further increases demand for truck parking in the region; and
- Industries that require transportation of freight by truck will continue to grow in Atlanta, which will increase the demand for truck parking facilities even more.

Recommendations from the ARC Truck Parking study that impact the Boulevard CID include:

- An assessment of truck parking needs and challenges should be required as part of comprehensive transportation plans and freight cluster plans;
 - The need for increased truck parking supply should be assessed with member jurisdictions through options including:
 - Expansion of existing truck stops and private lots;
 - Use of vacant industrial spaces and/or brownfield sites;
 - Coordination with shippers/receivers to allow on-site parking;
 - Expansion of existing public facilities; and
 - Use of closed public facilities.
 - Parking costs/benefits should be shared with new warehousing/distribution developments and other new freight-intensive land uses that generate demand for truck parking;
 - Zoning should be used to develop truck parking facility design standards which, among other benefits, could lessen negative community impacts through the use of buffer landscaping, lighting requirements, and safety/security requirements; and
-

- Local governments should be encouraged to review/update local zoning ordinances to address truck parking, including expansions of existing facilities and the construction of new facilities.

Beyond Georgia, truck parking studies from other states with notable practices are also informative to the development of the Boulevard CID FCP. These notable practices primarily relate to land use and zoning initiatives as that is a category of truck parking solutions that could be led by a CID, given their strong ties to county and municipal partners. Some of those studies are highlighted in the following subsections.

Arizona Truck Parking Study (2019). A key conclusion of the 2019 Arizona Truck Parking Study was that there was an insufficient supply of truck parking available to meet freight demand. A notable practice from that study was the use of Trucker Path data, a truck parking application used to crowdsource information about truck parking availability from over 800,000 users, to identify the utilization of public and private truck parking locations. The app data provided an opportunity to identify truck parking utilization in line with what a truck driver would see when they searched for parking along the road network. As a result, the Arizona Truck Parking Study was able to identify the density of truck parking availability throughout different intervals within a day. This data helped provide policy recommendations to enhance truck parking including integrating truck parking information into Arizona's 511 system and promoting truck parking partnerships to assist public and private stakeholders with construction and expansion of truck stops and advance opportunities for P3s.

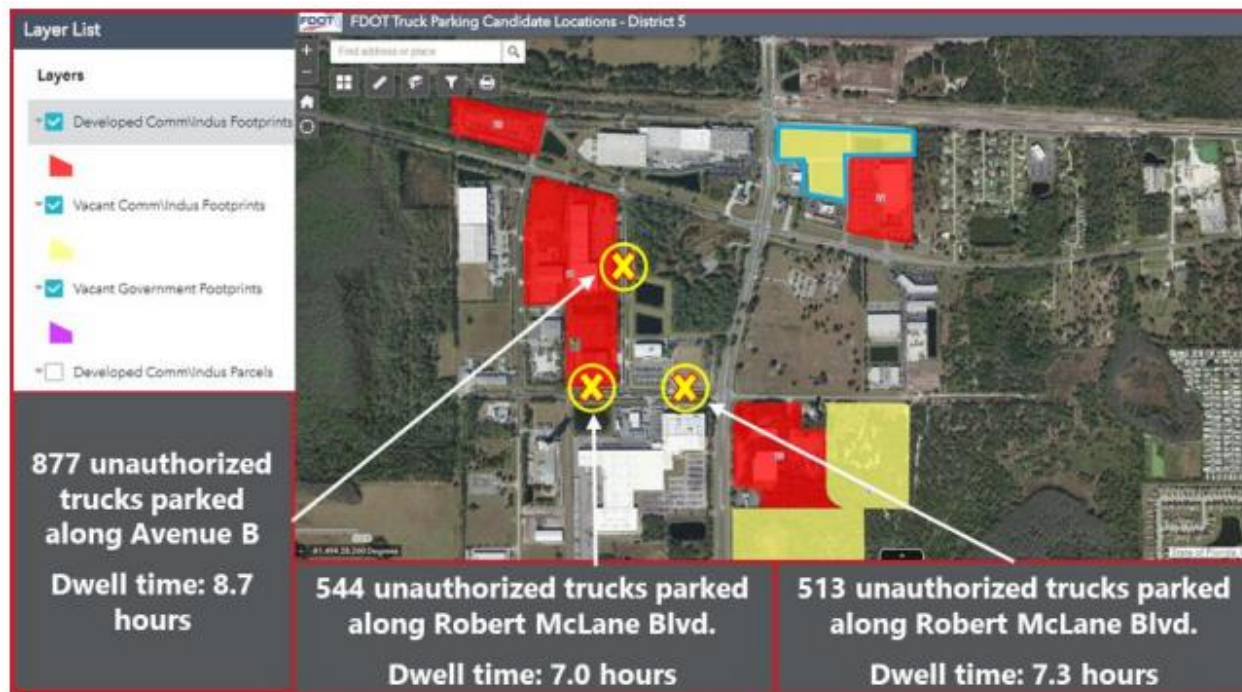
North Carolina Truck Parking Study (2020). The purpose of the North Carolina Truck Parking Study was to analyze the adequacy of off-road truck parking in the State of North Carolina, provide truck parking solutions that better serve freight transportation providers, and create a safer environment for the traveling public in and through North Carolina.¹⁴ One potential solution was a policy recommendation to require the inclusion of truck parking in site design for new industrial or commercial developments. North Carolina DOT recognized that local zoning ordinances often contain use-specific development standards (like for manufacturing operations or car dealerships or drive-through windows) that could be amended to better accommodate truck parking needs. The potential use of local zoning regulations to enhance the ability of states and regions to add truck parking capacity is a notable practice observed in several state truck parking studies.

Florida Statewide Truck Parking Study (2020). The Florida Department of Transportation (FDOT) developed the Statewide Truck Parking Study to identify, prioritize, and recommend solutions to address the areas in Florida with the greatest truck parking needs.¹⁵ The Statewide Truck Parking Study observed that the State of Florida had an insufficient supply of truck parking capacity to meet demand, which had implications for safety and overall freight system performance. Like several other states, Florida recognized the need to develop policies that incorporate truck parking into planning and land use. Florida's approach to incorporating truck parking into planning and land use is notable as FDOT created a land suitability analysis tool created to identify and screen parcels suitable for developing truck parking facilities. Such a tool, or a simpler process using the key methodological components, could be deployed at the freight cluster level to identify specific parcels to consider for truck parking. Figure 6 provides an illustration of the tool.

¹⁴ https://connect.ncdot.gov/projects/planning/Statewide-Freight-Plan/Documents/Truck_Parking_Study_Final.pdf

¹⁵ <https://www.fdot.gov/rail/studies/truck-parking>

Figure 6: Trucks Parked on Roads Near an Industrial Area



Source: <https://www.fdot.gov/rail/studies/truck-parking>

Minnesota Statewide Truck Parking Study (2019). The Minnesota Truck Parking Study was designed to build a better understanding of how truck parking issues impact Minnesota and what potential solutions could be undertaken by the Minnesota Department of Transportation (MnDOT) and its private sector partners.¹⁶ Among other solutions, the study identified two initiatives related to land use and zoning that could be used to address truck parking challenges near industrial, warehousing, and commercial areas. One is to develop minimum parking requirements, which the study noted are commonly included in zoning ordinances to develop large commercial parcels and could serve as a template for freight-related land use developments. The second is to change zoning near existing public and private truck parking facilities to allow truck parking “by-right”. Essentially, zones that allow certain uses “by-right” allow projects that conform to the zoning standards to receive project approvals without a discretionary review process.

Texas Statewide Truck Parking Study (2020). The purpose of the Texas Statewide Truck Parking Study was to conduct a statewide assessment of the current supply and demand for truck parking in Texas, identify needs, and develop solutions to address existing and future truck parking gaps and needs. The study also developed actionable strategies to meet truck parking needs across the state, promote partnerships with local governments and the private sector, enhance safety, reduce congestion, and improve efficiency on the Texas Highway Freight Network.

¹⁶ <https://www.dot.state.mn.us/ofrw/freight/PDF/truckparking/final-report.pdf>

One notable policy recommendation from the Texas Statewide Truck Parking Study was to coordinate with private property owners to allow truck parking at large parking facilities when not in use. The study noted that fairgrounds, stadiums, racetracks, and other event venues with large amounts of parking close to the highway in areas with high truck parking needs could potentially provide truck parking. These types of locations have schedules that are known far in advance, often have significant downtime, and are used to accommodate large numbers of vehicles and people in a condensed period. Near the Boulevard CID study area, the Six Flags Over Georgia amusement park is a large event venue with relatively predictable, seasonal demand. Extensive outreach and research on utilization patterns would be needed to confirm the feasibility of this site for such a use.

Another notable practice from the Texas Statewide Truck Parking Study was the development of high-level conceptual design drawings for an urban staging lot. The drawings included planning level cost estimates and rough timelines for engineering work (e.g., site survey design, environmental clearance, utilities, etc.). Technology solutions could be incorporated in these concepts as TPIMS technologies could be deployed at these lots. As noted in the ARC Truck Parking Study, regional truck parking needs are driven by both long-term (mandated 10 hour) parking and short-term staging needs. Thus, the inclusion of a high-level concept for an urban staging lot could be a part of broader solutions for meeting local and regional truck parking needs.

The Texas study also made recommendations that can be considered as notable practices for deploying technology for addressing truck parking challenges. The study noted that technology programs provide ways for the existing truck parking to be used more effectively and provide drivers with necessary information related to truck parking. The upfront capital costs and on-going maintenance costs are often lower than traditional infrastructure and the time needed for planning and implementation are a fraction of what is needed for construction. For these reasons, technology solutions are often more cost effective and timely in meeting immediate needs. A recommendation that is appropriate to consider at the freight cluster level is the identification of locations within the CID study area that might be good candidates to include in a TPIMS program should the state deploy such a system in the mid- to long-term. As a freight cluster, the CID is part of the first-/last-mile for numerous long-haul freight trips. Because of this, it could be a critical location for deploying information to motor carriers (potentially in the form of DMS) on available truck parking.

Land Use – Managing Conflicts

Maintaining industrial land uses in areas that are mixed use, or adjacent to incompatible land uses can be a challenge. With careful planning, industrial lands can be protected. Tools include buffer zones and modifications to established ordinances and zoning codes. Buffer zones refer to land uses that are put in place in order to create a transition between two other land uses that are incompatible; an example is a commercial development between a residential zone and an industrial zone. Buffer zones can be an important tool for preserving freight-intensive land uses as they help to mediate some of the negative externalities experienced by neighboring communities. In addition to buffer zones, efforts to modify local ordinances and zoning codes are also an important tool for preserving and protecting industrial land uses. These studies highlight best practices from Maryland, Illinois, and Oregon to preserve freight-intensive land uses.

Maritime Industrial Zone Overlay District (MIZOD), Baltimore, MD

The City of Baltimore's Maritime Industrial Zoning Overlay District (MIZOD) is an example of an effective zoning tool that preserves current freight-intensive land uses.¹⁷ This overlay district preserves waterfront land adjacent to the Port of Baltimore for industrial uses in the face of speculative commercial real-estate development activity that has applied considerable pressure to convert waterfront industrial properties to mixed-use. The City enacted the MIZOD in 2004 to preserve maritime properties with deep water, rail, and highway access in order to protect maritime-dependent uses and intermodal freight movement. The goal was to balance the needs of both mixed-use and maritime shipping. The City categorized its waterfront into two general districts: Mixed-Use and Maritime Industrial. In the first, mixed-use would be allowed, while in the second the MIZOD would protect maritime uses by prohibiting conversion of land to non-industrial uses. In addition, the Maritime Industrial district preserved these areas for industrial use by:

- Disallowing planned unit developments;
- Prohibiting hotels, motels, and taverns;
- Allowing offices and restaurants only as accessory uses; and
- Creating a 20-year moratorium on rezoning.¹⁸

The MIZOD is credited with protecting the integrity of the maritime area by preventing the encroachment of mixed use into maritime areas and with retaining major industrial employers dependent on port access, such as Domino Sugar. The City of Baltimore conducted evaluations of the MIZOD for the first three years and found that a) MIZOD firms had made significant capital investments after the MIZOD was enacted; and b) that businesses at the port grew - even when accounting for declines experienced during the Great Recession. Originally set to expire in 2014 to provide an opt-out period for participating landowners, no properties opted-out and the MIZOD was renewed in 2009, extending its expiration date to 2024. In 2017, the City of Baltimore enacted a new zoning code, making the Maritime Industrial Zone a permanent zoning district with the same protections as the MIZOD and no sunset provision.

City of Chicago Industrial Corridor Program

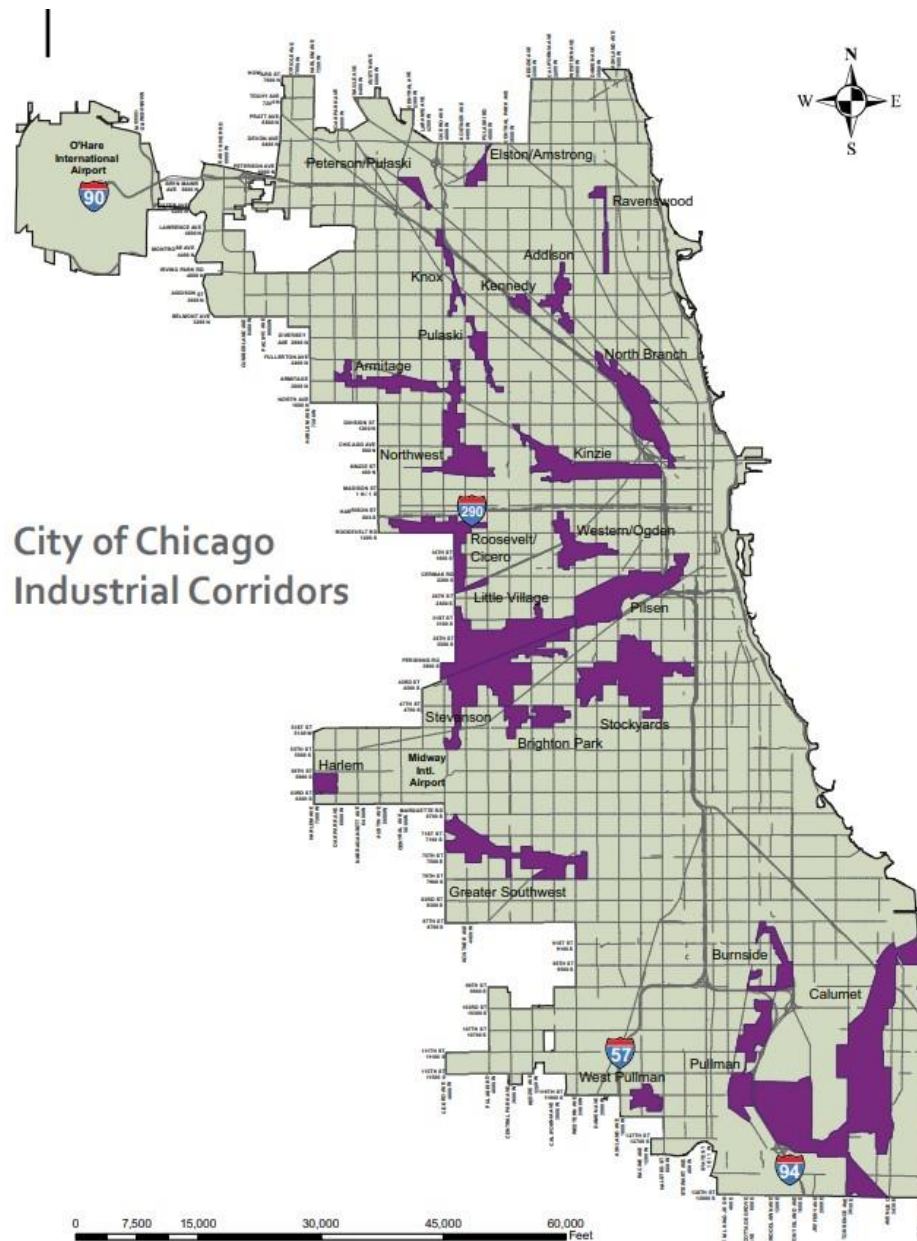
Chicago has been a hub of freight activity since its founding; it is the meeting point of eastern, western, and Canadian railroads, and is home to a port on the Great Lakes, a national air cargo hub, and a network of Interstate highways that handle thousands of truck trips every day. Despite the continued importance of freight-intensive industries to the Chicago economy, the demand for housing, particularly in the downtown area, put pressure on the industrial land uses as many sites have been or are being converted into residential developments. To combat the encroachment of non-industrial land uses, the City of Chicago created the Industrial Corridor Program in the 1990's to protect industrial land use and to guide further development along identified corridors. A feature of the Industrial Corridor Program is the identification of Planned Manufacturing Districts (PMD), which limits the type of developments within the PMD and

¹⁷ Department of Planning, City of Baltimore, Maritime Industrial Zoning Overlay District (MIZOD): Summary & Evaluation, 2009-2010, https://planning.baltimorecity.gov/sites/default/files/MIZODREPORT2010_1.pdf.

¹⁸ Maryland Port Administration, Partnerships to Address Urban Freight Challenges at the Port of Baltimore, Presentation to the 2019 METRANS International Urban Freight Conference, October 16, 2019.

establishes buffer zones near the edges of the PMD to allow a transition between industrial and non-industrial land uses. Figure 7 illustrates the industrial corridors in Chicago.

Figure 7: City of Chicago Industrial Corridors



Source: City of Chicago, Department of Planning and Development, Chicago Sustainable Industries.

Each established PMD also specifies the level of noise, vibration, smoke and particulate matter, toxic matter, noxious odorous matter, fire and explosive hazards, and glare or heat that can be emitted from properties

within the zone. The corridors with PMDs are identified by set characteristics including the existence of compatible land uses within the corridor, and accessibility to goods dependent industries and transit. There were 24 corridors identified in 2004 and 35 in 2011. These corridors and the PMDs have helped to legitimize the industrial clusters in the City of Chicago and have served as mechanisms for appropriate redevelopment.

Guild's Lake Industrial Sanctuary Plan

Adopted by the Portland (Oregon) Planning Commission and the Portland City Council in 2001, the Guild's Lake Industrial Sanctuary Plan provided a policy framework to preserve industrial land in the Guild's Lake Industrial Sanctuary (GLIS) and protect and promote its long-term economic viability as an industrial district.¹⁹ The GLIS is located along U.S. 30 and the Willamette River in the northwest portion of the City of Portland. It is one of the premier heavy industrial districts in the Pacific Northwest. The purpose of the Guild's Lake Industrial Sanctuary Plan was to protect and maintain this area as a unique place for a broad variety of industrial land uses and businesses.

The Plan was motivated by a desire to protect the GLIS from being encroached upon by non-industrial land uses. While the GLIS was still a functioning, viable industrial area, it had come under increasing pressure for changes to land use and development patterns that could diminish its role and stature. The Plan was implemented to promote the study area's economic viability as an industrial district and protect it from future redevelopment efforts.

Three policy action statements – supported with detailed objectives, action items, and timelines for completion – were developed as part of the Plan:

- **Jobs and Economic Development Policy Statement:** Maintain and expand industrial business and employment opportunities in the Guild's Lake Industrial Sanctuary. Stimulate investment in the area's public and private infrastructure and industrial facilities.
- **Transportation Policy Statement:** Maintain, preserve, and improve the intermodal and multimodal transportation system to provide for the smooth movement of goods and employees into and through the Guild's Lake Industrial Sanctuary.
- **Land Use Policy Statement:** Preserve and protect land primarily for industrial uses and minimize land use conflicts in the Guild's Lake Industrial Sanctuary. Allow compatible non-industrial uses within the GLIS that provide retail and business services primarily to support industrial employees and businesses.

In addition to the City Council adopting the Plan, amendments to the City's zoning code were also adopted in order to implement its policies and to ensure that new development and redevelopment will help realize the objectives of the Plan. The adopted zoning regulations included additional limitations and prohibitions on commercial, residential, and accessory office uses to ensure new developments will not interfere with industrial activities. The following is a summary of the zoning regulations:

- Retail sales and service and office uses in the heavy industrial zone larger than 10,000 square feet per use are prohibited. Such uses larger than 3,000 square feet are subject to conditional use approval;

¹⁹ <https://www.portlandoregon.gov/bps/article/59602>

- Accessory offices and headquarters offices in the heavy industrial zone are limited to 25 percent of a site's net building and work/storage area, or 25,000 square feet, whichever is less, with such uses exceeding these limits subject to conditional use approval;
- In the heavy industrial zone, household living, self-service storage, commercial outdoor recreation, and major event entertainment uses are prohibited; and
- In the General Industrial zones, household living, self-service storage, commercial outdoor recreation, and major event entertainment uses are prohibited.

Land Use - Electronic Commerce and Urban Infill

Electronic commerce (i.e., e-commerce) is the use of electronic devices and technologies to conduct commerce and trade, including purchasing goods and services on the internet and electronic banking. E-commerce increased from about 4 percent of total retail activity in 2010 to approximately 16 percent in 2020.²⁰ Some of the demographic factors driving this growth include total population, population density, a relatively high population of millennials, families with young children, higher than median household incomes, and higher disposable incomes (see Figure 8).²¹ The steady growth of e-commerce as a preferred method for purchasing consumer goods and its acceleration during the COVID-19 pandemic have impacted freight traffic and land use patterns in metropolitan regions including Metro Atlanta. As same-day and next-day delivery is commonplace for e-commerce transactions, retailers are sensitive to the impacts of distance, congestion, and poor travel time reliability for meeting customer demands. As a result, a common practice is to position fulfillment centers close to population centers with good access to major highways.²² This contrasts with previously observed trends of industrial land uses generally sprawling away from city centers. The development of urban infill logistics facilities to support e-commerce is an innovative supply chain practice that the Boulevard CID is a locus of today as it develops its Freight Cluster Plan.

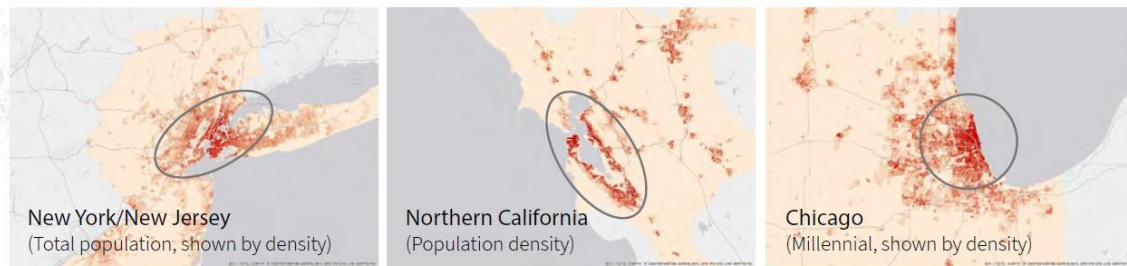
²⁰ U.S. Census Bureau News. Quarterly Retail E-commerce Sales.
https://www.census.gov/retail/mrts/www/data/pdf/ec_current.pdf

²¹ <https://www.us.jll.com/content/dam/jll-com/documents/pdf/research/americas/us/am-research-Urban-infill-the-route-to-delivery-solutions.pdf>

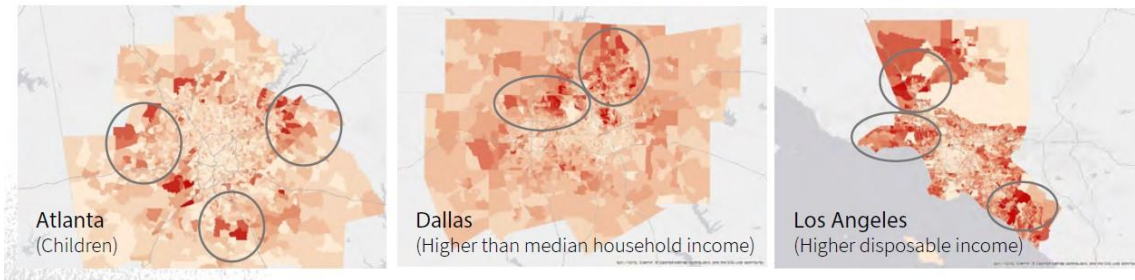
²² Ibid.

Figure 8: Examples of Demographic Factors Driving E-Commerce Growth

Urban core demographic examples



Suburban demographics examples



Source: Jones Lang LaSalle, Urban infill: the route to delivery solutions, 2020.

Re-purposing or rehabilitating existing urban infill industrial facilities to meet modern e-commerce logistics needs is currently and will continue to impact the Boulevard CID. For example, companies have been able to raise the roofs of older properties and make other improvements so that they may serve e-commerce demand. The CID is well-positioned for this type of development as it is less than 1 hour from the core of the Metro Atlanta region, is proximate to other regional centers, such as Perimeter Center and Cumberland, and is adjacent to I-20 and the I-285 Perimeter itself. As the population density and economic activity of Metro Atlanta grows, so too will the demand for goods consumed via e-commerce and the land needed to facilitate consumer demand.

Truck Routing

Truck routing is an important operational issue to consider in freight cluster planning. In particular, at the freight cluster level one aspect of truck routing that becomes more important is minimizing impacts to communities that are adjacent to freight-intensive land uses and are thus a part of the first/last mile. It is not uncommon for communities that are adjacent to freight clusters to complain about large trucks operating or parking on residential streets. Burgeoning growth in internet home delivery makes this issue especially challenging. Effective truck routing – in the form of signage, wayfinding, and pavement markings – can minimize community impacts and promote safe and efficient movement of goods in and around a community.

O'Hare Subregion Truck Route Plan

The Chicago O'Hare International Airport Subregion is a significant economic engine for the Chicago region, the State of Illinois, and the nation as a whole. The region is home to numerous manufacturing, logistics, and other freight-intensive industries. While O'Hare International Airport is the hub of the subregion, the regional highways and streets that connect suppliers, customers, warehouses, and other businesses are critical, facilitating the travel of thousands of trucks on a daily basis. The O'Hare Subregion Truck Route Plan was developed by the Chicago Metropolitan Agency for Planning (CMAP) for the purpose of helping the municipalities surrounding Chicago O'Hare International Airport coordinate policy and investment decisions to facilitate the flow of trucks in the region, while mitigating the negative impacts of such high levels of freight activity.

The primary outcome of the O'Hare Subregion Truck Route Plan was the development of a subregional truck route network that provided connectivity to the National Highway Freight Network as well as local destinations. The Truck Route Plan first identified several overarching needs for the O'Hare subregion including: (1) closing gaps in the existing truck route network; (2) designating existing and developing new arterial routes to facilitate through truck traffic; (3) improving direct interstate connectivity for major facilities; (4) providing relief to truck bottlenecks; and (5) planning for increased levels of truck traffic as the O'Hare Subregion continues to add new freight-intensive developments and renovate aging facilities.

To meet the region's identified needs, CMAP developed a truck route categorization framework that features a four-tier system for describing the use and need of the subregion's roadways as related to trucks.

- Level A Truck Routes – These are high-mobility roads critical to through truck movements and for providing access to high-volume intermodal facilities. Truck-related investments should be prioritized on Level A Truck Routes even if passenger improvements are not necessary.
- Level B Truck Routes – These roads facilitate both through movements and local access for large trucks, including first-/last-mile connections. Truck-related investments should be balanced with passenger improvements on Level B Truck Routes.
- Level C Truck Routes – These roads provide local access for small trucks. Truck-related investments on these routes may be considered but not necessarily prioritized.
- Level D Roads – Trucks are strongly discouraged or restricted on these roads and truck access should not be a consideration in investment decisions.

The CMAP O'Hare Subregion Truck Route Plan concluded with a proposed truck route network and a set of recommendations related to identifying capital improvement projects, coordinating across agencies, and improving regional truck data. Other technical tasks conducted as part of the Truck Route Plan that are relevant to subregional freight planning in general include examining barriers to multi-jurisdictional truck routes (such as changing land use patterns, lack of local support, different weight limits across jurisdictions, etc.) and identifying opportunities for freight funding at the federal and state levels.

Truck Route Plan for the City of Sharon

The primary goal of the study was to develop a truck route plan for the City of Sharon that could be implemented to move trucks safely and efficiently in Mercer County, Pennsylvania.²³ The City of Sharon experiences a significant volume of truck traffic (both tractor trailers and smaller distribution trucks) transporting goods to and from nearby rail lines, I-80, I-79, SR 60 and thirteen major industrial and distribution facilities located in or immediately adjacent to the study area. The study aimed to improve truck access to numerous facilities while also improving pedestrian and automobile safety and mobility in the area.

The study evaluated existing conditions such as daily truck volumes, hourly truck volumes, truck origins-destinations and deficiencies along current truck routes. The plan identified general improvements to truck movements such as truck route signage, pavement markings and traffic signal operations, in addition to short-term and long-term improvement alternatives such as minor route shifts and street connections. All alternatives aimed to improve access and reduce highlighted deficiencies. Furthermore, each improvement alternative was qualitatively evaluated with respect to seven key objectives that addressed the most notable project deficiencies and were then presented to stakeholders who selected, prioritized, and advanced locally preferred alternatives to consider for funding, programming and implementation needs.

Technology and Data

The intersection of technology innovation and transportation continues to influence freight movement. Technology advancements can be used to address freight transportation needs and issues; support future growth in freight volume and flow; improve freight mobility across all modes in terms of safety, efficiency, and reliability; and foster increased economic growth through reduced transportation cost and enhanced productivity. Table 1 provides a high-level review of freight technology areas that should be considered when addressing the future of freight movement within the Boulevard CID.

Table 1: Freight Technology Areas

Technology Area	Definition	Example
Dynamic Route Guidance	Dynamic Route Guidance includes technologies that incorporate real-time traffic and roadway conditions, allowing drivers to make re-routing decisions to a more optimal route.	The INRIX Artificial Intelligence (AI) Traffic tool is an example of dynamic route guidance. It detects changes in road conditions and alerts drivers instantaneously via a mobile application. This application can be used to inform drivers about slowdowns, incidents, and weather conditions allowing them to make dynamic routing decisions.
Data Integration and Analytics	The cumulation of large datasets accompanied by analysis to better understand	Denver's Enterprise Data Management System is a platform that compiles a wide

²³ <https://mcrpc.com/wp-content/uploads/2017/05/Sharon-Truck-Route-Report-FINAL.pdf>

Technology Area	Definition	Example
	travel patterns, and to help manage traffic and operate transportation systems.	range of real-time information, including freight, and uses artificial intelligence (AI) to help improve traffic management in the city.
Automated and Connected Freight Vehicles	Technologies used to support connected and automated freight vehicles that include a combination of smart infrastructure, the linkage of two or more trucks, and automated vehicle control systems.	Local initiatives such as the Atlanta Regional Commission's Connected Vehicle Project and the Gwinnett County Connected Vehicle Technology Master Plan are examples that demonstrate the testing and implementation of connected vehicle technology to improve traffic congestion and reduce crashes. These initiatives involve installing 1,700 roadside units (RSU) that communicate with dedicated short-range communications (DSRC) and cellular technology along and near smart corridors.
Traffic Management	Traffic management technologies are deployed to implement strategies to improve mobility and safety operations for all users.	SR 6 in Douglas and Cobb Counties is an example of a traffic management initiative that deployed freight technology. The project integrated roadway geometric and capacity improvements with freight intelligent transportation systems (ITS) elements to create a truck friendly corridor. The technology elements included dilemma zone protection for trucks and traffic responsive signal timing based on sensing mix of vehicles and adjusting for heavy truck volumes.
Intermodal Terminal Operations	The interchange between modes is crucial for freight mobility. Intermodal terminal operations include truck queuing, truck staging/parking and truck appointment systems.	An example of an intermodal terminal operations application is the Siemens Integrated Truck Guidance tool. It combines logistics scheduling data with real-time regional traffic data to provide an accurate status of the flow of goods and traffic conditions around a terminal. This information is shared with truck drivers, terminal operations, and logistics providers to provide a communication platform that helps eliminate bottlenecks and increase efficiency at terminals.

As highlighted above, technology innovation across many freight-related areas is being implemented to improve freight operations and to support integrated transportation ecosystems that revolve around big data analytics, logistics as a service (Laas), Internet of Things (IOT), robotics, and automation²⁴. Current and future trends (which will be explored in greater detail in Task 4) such as the switch to renewable energy sources, the integration of Artificial Intelligence (AI), and rising demand for e-commerce and same day-delivery expectations will require innovative solutions to accommodate freight needs. As noted in the 2020 State of Georgia's Supply Chain/Logistics Technology Ecosystem report, AI trends are shaping almost every industry, but especially the supply chain and logistics field. AI predictive capabilities in network planning are allowing markets to become more proactive by estimating how many freight vehicles are needed at specific locations based on demand, for example. Furthermore, mobile technology is being implemented to manage distribution operations while robotics is being used to create fully automated smart warehouses. As a freight hub, the Boulevard CID has an opportunity to leverage technology advancements to support enhanced mobility, greater safety, and improved reliability for passengers and freight.

Summary of Best Practices

The review of notable practices has shown that there is a variety of analyses, technologies, policies, and operational and design approaches to help address freight planning challenges experienced within freight clusters. Many of the best practices cited were identified and called out in the scope of work for this Freight Cluster Plan. They were incorporated either as components of the technical approach, or as potential solutions as part of recommended projects, policies, and programs, and thus are intrinsically under consideration for the Plan. Nevertheless, for the sake of completeness, these practices are included in the comprehensive summary provided below, along with other best practices uncovered through research and not explicitly included in the scope of work. The best practices to be incorporated into the Boulevard CID Freight Cluster Plan are summarized below:

- Transportation Condition and Performance
 - **Freight-Focused Safety Analyses.** Many of the studies and plans included in the best practices review featured safety analyses that focused on freight vehicles. Primarily, these included analyses of crashes involving trucks and those occurring at highway-rail crossings. Studies that focused on truck parking also included analyses of crashes involving parked trucks as an indicator of where truck parking needs are a driving factor of safety challenges. Incorporating freight-focused safety analyses is considered a best practice for freight cluster planning and has already been identified as such in the Freight Cluster Plan's scope of work.
 - **Freight-Focused Travel Time and Congestion Analyses.** The studies and plans included as part of the best practices review also featured analyses of highway performance that focused on heavy trucks. Examples include intersection level of service

²⁴ TAG Supply Chain and Logistics, 2020 State of Georgia's Supply Chain/Logistics Technology Ecosystem. https://www.tagonline.org/wp-content/uploads/2020/01/2019-Supply-Chain-Report_compressed.pdf

analyses along freight corridors (a scope-identified best practice) and travel time analyses using truck probe data. These types of analyses are a best practice because they allow stakeholders to focus in on corridors that are important for freight mobility but may not receive the same attention as corridors that carry large volumes of both freight and commuter traffic.

- **Freight Asset Condition Analyses.** In addition to safety and performance analyses, notable studies and plans also devoted significant attention to the condition of freight assets. In particular, pavement and bridge conditions on freight corridors were a primary interest. This scope identified best practice highlights both the impact that goods movement has on the state of good repair of the transportation system and the impact that the condition of the transportation system has on freight mobility. Freight vehicles often disproportionately cause damage to transportation assets. However, freight vehicles are significantly impacted by poor infrastructure conditions as they can damage valuable goods and make freight trips less efficient, for instance when vehicles must take circuitous routes to avoid bridges or other facilities with conditions that are insufficient for carrying heavy trucks.
 - **Scenario Planning for Freight.** A notable practice observed in some plans and studies was the use of scenario planning within a freight context. Generally, these plans developed scenarios for growth in freight activity (i.e., in terms of freight traffic volumes) and/or changes to external factors impacting freight at the cluster level (e.g., changes to trade policy, funding levels, etc.) and assessed the implications of these scenarios for the freight cluster. This is a best practice because it allowed those stakeholders to understand the implications of alternative futures for investment needs and policy and programmatic strategies.
 - Land Use
 - **Utilizing Zoning to Mitigate Freight Impacts.** A strategy employed in some of the plans and initiatives that represents a best practice is the use of zoning to mitigate freight impacts. An example is zoning ordinances to require the provision of space for truck parking and staging as part of warehousing and industrial developments, mitigating the impact of truck parking needs on neighboring communities. Another example is zoning ordinances that alter how new warehousing and industrial developments interact with the public right-of-way, placing a greater focus on limiting driveways, encouraging inter-parcel access, preserving space for alternative transportation modes, and creating buffers between industrial and non-industrial land uses.
 - **Utilizing Zoning to Preserve Freight-Intensive Land Uses.** Another land use strategy that represents a best practice is the use of zoning to preserve freight-intensive land uses. These practices include the development of overlay districts and performance-based zoning codes that encourage or make it easier to develop land for freight-intensive uses. This is a best practice that is most relevant for freight clusters experiencing pressure for the redevelopment of industrial land to residential, commercial, and mixed-use.
 - Truck Parking and Staging
 - **Truck Parking Technologies.** A notable practice observed in some plans was the identification (and in some plans the conceptual development) of ITS technologies to
-

improve the utilization and efficiency of truck parking. These technologies were conceived as part of state and/or regional ATMS and aimed to deliver to motor carriers information on the location and quantity of available truck parking. The exploration of these types of truck parking solutions is a best practice for freight clusters because there may be opportunities for local applications of truck parking ITS concepts that could eventually be folded into a broader regional and/or statewide system.

- **Public-Private Partnerships for Truck Parking.** The development of public-private partnerships (P3s) to increase the supply of truck parking is a notable practice that was observed in some plans and initiatives. There were examples of plans and initiatives that highlighted some of the impediments to developing truck parking P3s and how those impediments might be overcome. The exploration of truck parking P3 opportunities represents a best practice for freight clusters because they may offer solutions to existing truck parking and staging needs. Furthermore, as truck parking P3s are an emerging focus area for addressing truck parking needs, it also represents an opportunity for freight clusters to contribute to the development of successful template agreements that may be replicated elsewhere.
- **Public Truck Parking.** Another notable best practice for truck parking is the provision of public truck parking beyond traditional locations, such as through public rest areas and welcome centers. There are examples of local governments providing truck parking in the form of municipal lots dedicated to truck parking and the development of ordinances codifying the allowance of overnight truck parking on specific city streets. This represents a best practice for freight cluster planning as it demonstrates how other areas have taken steps to address truck parking challenges. These practices also provide examples of how community concerns about truck parking near residential and commercial areas have been mitigated.
- **Stakeholder Engagement**
 - A common theme of nearly all the studies, plans, and initiatives included in this review is the importance of stakeholder engagement. Most of the plans and initiatives reviewed had significant outreach to identify and prioritize investments. This provided the dual benefit of improving the quality of the finished products and making them actionable and implementable so that real-world improvements could be gained. This best practice has already been integrated into the Freight Cluster Plan as part of the project scope of work.

In addition to the lessons learned from the studies, plans, and initiatives included in this review, it is important to note that a number of freight cluster plans have been completed, or are nearing completion, as part of ARC's freight cluster planning program. These include plans for the Gateway85 CID, the Tucker-Summit CID, Aerotropolis Atlanta CIDs, and Spalding County. Though we are just at the beginning stages of being able to review and assess these studies for best practices, one key lesson learned that has already emerged is the importance of creative and multiple avenues for engaging stakeholders. All of these studies featured multiple outreach efforts including electronic surveys, online maps for commenting, and interviews, among others. These types of efforts for engaging stakeholders will be critical for the Boulevard CID moving forward.



FREIGHT CLUSTER PLAN

Inventory and Assessment

CONTENTS

1	Introduction	7
2	POLICY AND PLAN REVIEW	8
2.1	State and Regional Plans.....	9
2.1.1	Georgia Department of Transportation (GDOT) Freight and Logistics Plan Update, 2013	9
2.1.2	GDOT Georgia State Rail Plan, 2020	10
2.1.3	Transportation Element of the Atlanta Regional Commission Atlanta Region's Plan, 2020... ..	11
2.1.4	Atlanta Regional Commission Freight Plan Update, 2016.....	12
2.1.5	Atlanta Regional Commission Truck Parking Study, 2018	13
2.1.6	The Chattahoochee RiverLands Greenway Study, 2020.....	14
2.2	Comprehensive Transportation Plans.....	15
2.2.1	Southern Fulton Comprehensive Transportation Plan, 2020.....	15
2.2.2	Connect Atlanta Comprehensive Transportation Plan, 2008.....	16
2.2.3	Cobb County Comprehensive Transportation Plan Update: 2040, 2015.....	17
2.2.4	Douglas County Comprehensive Transportation Plan, 2008.....	18
2.3	Comprehensive Plans	18
2.3.1	2035 Fulton County Comprehensive Plan, 2016	18
2.3.2	City of Atlanta Comprehensive Development Plan, 2016.....	19
2.3.3	Cobb County 2040 Comprehensive Plan, 2017.....	20
2.3.4	Douglas County Comprehensive Plan Update, 2018	21
2.4	Local Plans.....	22
2.4.1	Economic and Fiscal Impact Analysis of the Fulton Industrial District Study, 2018	22
2.4.2	Fulton Industrial Community Improvement District Master Plan, 2013.....	23
2.4.3	Fulton County Executive Airport Technical Assistance Panel Report, 2020	24
2.4.4	Neighborhood Planning Unit G (NPU-G) Master Plan, 2010.....	26
2.4.5	Adamsville Neighborhood Planning Unit H (NPU-H) Master Plan, 2020.....	26
2.4.6	D.L. Hollowell Parkway/Veterans Memorial Highway Livable Centers Initiative Study, 2010	27
2.5	Other Ongoing Projects and Initiatives	29
2.5.1	Fulton County Transportation Special Purpose Local Optional Sales Tax (TSPLOST)	29
2.5.2	Renew Atlanta-TSPLOST	29
2.5.3	Major Mobility Investment Program.....	30

2.5.4	Regional Connected Vehicle Program	31
3	FREIGHT ANALYSIS	32
3.1	Freight Demand	32
3.1.1	Temporal Patterns	32
3.1.2	Spatial Patterns	35
3.2	Route Analysis	37
3.3	Congestion Analysis.....	41
3.3.1	Recurring and Non-Recurring Congestion	41
3.3.2	Regional Connectivity	46
3.4	Truck Parking	48
3.4.1	Undesignated Parking Analysis	50
4	EXISTING CONDITIONS AND PERFORMANCE	54
4.1	Roadway Characteristics	54
4.1.1	Functional Classification	54
4.1.2	Designated Truck Routes.....	55
4.1.3	Lane Configuration	59
4.1.4	Lane Widths	61
4.1.5	Bridges	62
4.2	State of Good Repair	65
4.2.1	Pavement Condition	65
4.2.2	Curb Condition	68
4.3	Vulnerable Transportation Assets	69
4.3.1	Flooding.....	69
4.3.2	Terrorism	71
4.4	Safety Analysis.....	72
4.4.1	Crashes by Vehicle Type	72
4.4.2	Crash Severity and Manner of Collision.....	75
4.4.3	Bicycle and Pedestrian Safety	78
4.4.4	Crash Rates on Key Corridors	80
4.4.5	Potential Contributing Factors to Safety Challenges	82
4.5	ITS and Technology	82
4.6	Rail	85

4.7	Transit, Bicycle, and Pedestrian Connectivity	86
4.7.1	Data Collection Process	87
4.7.2	Transit Infrastructure and Operations	87
4.7.3	Bicycle and Pedestrian Infrastructure	89
4.8	Transportation Demand Management and Job Access	90
4.9	Other Transportation Assets	94
4.9.1	Alternative Fuel Facilities	94
4.9.2	Pipelines	96
4.10	Land Use and Zoning	97
4.10.1	Existing Land Uses	98
4.10.2	Future Land Uses	103
4.10.3	Land Use Considerations for the CID Study Area	111
5	TRENDS AND EXPECTED CHANGES	113
5.1	Growth in Electronic Commerce	113
5.2	Warehouse/Distribution Center Design and Urban Infill	115
5.3	Advances in Supply Chain Operations and Design	116
5.4	Connected and Autonomous Freight Vehicles	118
5.5	Commercial Vehicle Electrification	121
5.6	Transportation Data and Operational/Management Technologies	123
5.7	Emerging Freight Trends Considerations for the CID Study Area	125
6	OPPORTUNITIES AND NEEDS ASSESSMENT	126
6.1	Capacity and Congestion	126
6.2	Safety	127
6.3	Condition	128
6.4	Truck Parking	129
6.5	ITS	130
6.6	Land Use and Zoning	130
6.7	Work Force Accessibility	131
7	Conclusion	132

TABLES

Table 1: Locations of Undesignated Truck Parking	52
Table 2: Functional Classification Definitions	54
Table 3: National Highway Freight Network Subsystems	56
Table 4: PSR Categories	67
Table 5: Manner of Collision Descriptions	77
Table 6: Crash Rates on Key Corridors Exceeding Statewide Averages	81
Table 7: ITS Signal Inventory along Fulton Industrial Boulevard	83
Table 8: Summary of Field Data	87
Table 9: Employer and Employee Count	91
Table 10: Employee Commute Modes	93
Table 11: Society of Automation Engineers (SAE) Automation Levels	118

FIGURES

Figure 2: INRIX Data Set Totals	32
Figure 3: Trucking Activity by Day of Week	33
Figure 4: Hourly Origins of Truck Trips	34
Figure 5: Hourly Destination of Truck Trips	34
Figure 6: ARC Freight-Intensive Clusters	35
Figure 7: Geographical Patterns of Truck Trips Involving FIB	36
Figure 8: Geographical Patterns of Truck Trips Involving FIB and other Freight Clusters	37
Figure 9: Trips to and from Regional Terminals	37
Figure 10: Map of Truck Volumes in the Boulevard CID	39
Figure 11: Map of Truck Volumes heading to or from Boulevard CID	40
Figure 12: Statewide Freight Volumes to and from Fulton Industrial Boulevard	41
Figure 13: Example Calculation of Congestion Metrics	43
Figure 14: Map of Vehicle Excess Hours of Travel Per Mile in Boulevard CID	44
Figure 15: Map of Vehicle Hours of Unreliability Per Mile in Boulevard CID	45
Figure 16: Map of Average Speeds During the AM Period in Boulevard CID	46
Figure 17: Travel Times and Speeds of Trips from Freight Clusters to Boulevard CID	47
Figure 18: Travel Times and Speeds of Trips from Boulevard CID to Freight Clusters	47
Figure 19: Travel Times Between Boulevard CID and Nearby Intermodal Terminals	48
Figure 20: Private Truck Parking Facilities	49
Figure 21: Analysis of Truck GPS Data to Identify Undesignated Truck Parking Hotspots	51
Figure 22: Map of Undesignated Parking Locations	53
Figure 23: Roadway Functional Classification	55
Figure 24 : National Highway Freight Network Routes	57
Figure 25: ARC Regional Truck Routes	58
Figure 26: City of Atlanta Truck Routes	59

Figure 27: Lane Configurations	60
Figure 28: Lane Widths	61
Figure 29: Bridge Locations	62
Figure 30: Bridge Sufficiency Ratings	63
Figure 31: Bridge Load Rating for Semi-Trailer Trucks	64
Figure 32: Bridge Clearances	65
Figure 33: Pavement Condition (IRI)	66
Figure 34: Pavement Condition (PSR).....	67
Figure 35: Curb Cracking and Off-Road Rutting at Intersection of SR 70/Fulton Industrial Boulevard & Phillip Lee Drive	68
Figure 36: Intersections with Curb Cracking and/or Off-Road Ruts	69
Figure 37: Floodplains.....	70
Figure 38: Potential Terrorism Targets	71
Figure 39: Total Crashes, 2016 to 2020	72
Figure 40: Total Crashes on Non-Interstate Roadways, 2016 to 2020	73
Figure 41: Crashes by Vehicle Type.....	74
Figure 42: Share of Crashes by Major Roadway, 2016 to 2020.....	75
Figure 43: Crashes by Severity, 2016 to 2020.....	76
Figure 44: Crashes by Severity, 2016 to 2020.....	76
Figure 45: Crashes by Manner of Collision, 2016 to 2020.....	78
Figure 46: Crashes Involving Bicycles and Pedestrians, 2016 to 2020.....	79
Figure 47: Mendel Drive/Wharton Drive at SR 70/Fulton Industrial Boulevard.	80
Figure 48: Crash Rates on Key Corridors that Exceed Statewide Averages	81
Figure 49: Traffic Signals on Fulton Industrial Boulevard	83
Figure 50: Rail and Railroad Crossings	86
Figure 51: Transit Infrastructure and Operations	88
Figure 52: Bus Stop 900696	89
Figure 53: Bicycle and Pedestrian Infrastructure	90
Figure 54: Employment Density Versus Available Transit.....	92
Figure 55: Job Access Via Transit	93
Figure 56: Alternative Fuel Facilities.....	94
Figure 57: Passenger EV Charging Station	95
Figure 58: TrilliumCNG Pump	95
Figure 59: Clean Energy CNG Pumps.....	96
Figure 60: Pipelines	97
Figure 61: Fulton County Zoning	99
Figure 62: City of Atlanta Character Areas	100
Figure 63: City of South Fulton Zoning	101
Figure 64: City of Douglasville Zoning	102
Figure 65: Cobb County Existing Land Uses	103
Figure 66: Fulton County Future Land Uses.....	104
Figure 67: Proctor Creek Trail Extension.....	105

Figure 68: City of South Fulton Future Land Uses.....	106
Figure 69: City of Atlanta Future Land Uses	107
Figure 70: City of Atlanta Future Land Uses Near the Bolton Node	108
Figure 71: NPU-H Master Plan Future Land Uses Along Bolton Road	109
Figure 72: Douglas County Future Land Uses.....	110
Figure 73: Cobb County Future Land Uses	111
Figure 74: Annual E-Commerce Retail Sales, 1998-2019.....	114

1 INTRODUCTION

The Boulevard Community Improvement District (CID) is undertaking a Freight Cluster Plan (FCP) to understand how transportation infrastructure within the Fulton Industrial District (FID) is being used for the handling of freight. The purpose of the FCP is to address transportation planning, traffic operations, and related planning needs, and to identify and recommend projects and policy changes to address those needs. This technical memorandum provides a detailed inventory of the existing conditions within the CID study area and an assessment of what parts should be improved to better support the freight network. The aspects of the CID that are covered in this technical memorandum include:

- Previous studies and plans that are relevant to the study area;
- The local and regional freight network;
- Transportation infrastructure;
- Land use and zoning; and
- Current and future freight trends.

The findings in this memorandum form a major part of the foundation for policy and project recommendations to be developed in Task 6 of this study.

2 POLICY AND PLAN REVIEW

This section of the report reviews previous studies that are relevant to the CID study area and the freight cluster plan. Specifically, the review focuses on state and regional plans that have a freight focus, comprehensive transportation plans, comprehensive plans, local plans, and other major ongoing capital and maintenance projects in or adjacent to the CID. State and regional freight, rail, and truck parking plans provide insight into the overarching freight trends and issues impacting the Boulevard CID. Comprehensive transportation plans provide the long-term transportation investment plan for counties and cities. Comprehensive plans establish the vision for the future growth of cities and counties from a land-use perspective. Both are important sources of information on future investments and potential changes to land use. Local plans provide detailed information, often at the corridor and parcel levels, of the current and future transportation and land use issues impacting the CID. Examples include the CID's 2013 Master Plan, studies completed as part of the ARC's Livable Centers Initiative grant program, and plans produced as part of the City of Atlanta's neighborhood planning unit program.

It should be noted that though many of these plans were recently conducted, the long-term impacts of the COVID-19 pandemic on land use development patterns, travel behavior, and funding, could significantly alter the assumptions and forecasts on which these plans were based. However, they are still useful for understanding the current and future outlook of the CID. Some notable takeaways from the review of previous studies include the following:

- From the review of state and regional plans, considerable growth in freight volumes is expected over the long-term at the state and regional levels. This growth will result in higher volumes on major freight corridors such as SR 70/Fulton Industrial Boulevard. Furthermore, growth in freight volumes will exacerbate existing challenges (e.g., safety, travel time reliability, congestion) unless mitigating steps are taken.
 - There is a region-wide shortage in truck parking for both long-term and short-term staging needs. Though a major truck parking facility is proximate to the CID, there is a complete absence of major truck parking options in Cobb County, north Fulton County, Gwinnett County, and other parts of Metro Atlanta that place a strain on the entire region. Growth in freight volumes will only worsen this current challenge without additional capacity and operational strategies to utilize existing supply more efficiently.
 - The review of comprehensive transportation plans revealed that roadways within the CID have been identified as priority corridors for investments in transit, freight, and innovative transportation technologies. Examples include SR 6/Camp Creek Parkway and SR 70/Fulton Industrial Boulevard. The Southern Fulton Comprehensive Transportation Plan identified SR 6/Camp Creek Parkway as a target corridor for arterial rapid transit while SR 70/Fulton Industrial Boulevard was identified as a priority corridor for automated parking systems, electric vehicle charging stations, signal priority for transit and/or freight, and other innovative technology solutions.
 - Though much of the land in the CID serves industrial purposes, thereby limiting conflicts with incompatible land uses, proposed changes to future land uses along the borders of the CID could alter this over the long term. The review of comprehensive plans and local plans showed that future plans to spur redevelopment at certain nodes in the CID could introduce higher-intensity, residential
-

and mixed-use developments. This was most evident along portions of Bolton Road, SR 8/US 78/US 278/Donald L. Hollowell Parkway, and Aviation Circle at the northern end of the CID. Steps must be taken to limit conflicts between potentially growing numbers of competing roadway users and enhance safety and mobility for all.

2.1 State and Regional Plans

2.1.1 Georgia Department of Transportation (GDOT) Freight and Logistics Plan Update, 2013

2.1.1.1 *Objectives and Overview*

The GDOT Statewide Freight and Logistics Action Plan was completed in 2013. The plan performed an assessment of the State's multimodal freight needs and provided a strategy for addressing those needs. It was conducted in conjunction with the private sector to facilitate a strategic, business-oriented approach to develop specific freight and logistics improvement solutions with the largest economic returns. The Plan integrated freight modes into GDOT activities and serves as an economic development tool for marketing Georgia and growing jobs and investment. It should be noted that GDOT has begun the process of updating the statewide freight plan.

2.1.1.2 *Key Findings*

Some key findings from the Georgia Freight and Logistics Action Plan include the following:

- Trucking is the backbone of the state's multimodal freight system. Trucks were estimated to carry 75 percent of the total 853 million tons of freight flowing around Georgia and 88 percent of the total value. Rail was estimated to carry just under 25 percent of total tonnage and 10 percent of total value. Water and air carried less than one percent of total tonnage and about two percent of total value.
 - Trucking is the dominant mode of moving freight in Georgia and is expected to continue to be the dominant mode over the long term. It is also the primary connecting mode for marine, rail, and air cargo to final destinations in Georgia. The trucking industry experiences a significant amount of congestion in Metro Atlanta where both long-haul and local/distribution truck traffic are the highest. This congestion is forecast to get more severe (in terms of delay per vehicle), longer (in terms of the duration of peak periods), and more prevalent on the interstate corridors that connect Atlanta with its neighboring states and key trading partners.
 - Metro Atlanta is the second busiest "inland port region" in the U.S. as it moves the second highest tonnage of freight of all the non-coastal metropolitan regions in the country. It is responsible for over one-third of all the freight traffic in Georgia. This large volume of freight is due to Atlanta's dual role of being the primary distribution hub in the south and also having a very significant consumer base as the most populous metropolitan region in the south.
 - The Port of Savannah is the key distinguishing feature of the freight infrastructure in Georgia. It has been successful in capturing discretionary container traffic along the East Coast and boosting Georgia's economy. Deepening the Savannah Harbor and channel to accommodate the larger ships is critical to maintaining this distinction. To maximize Georgia's full potential to move marine
-

cargo in the longer term, an additional port in Jasper County, South Carolina will be needed along with expansion of the rail and road connections to both the Port of Savannah and the Jasper Port.

- The Georgia Freight and Logistics Action Plan determined that by investing \$18-\$20 billion over the next 40 years in freight improvement projects, the State could generate over \$65 billion in additional economic output and thousands of new jobs.

2.1.1.3 Recommendations

For each mode, the GDOT Statewide Freight and Logistics Plan recommended a set of improvements and estimates the economic return on those investments. Just outside the CID study area, the reconstruction of the I-285 at I-20 interchange was identified as a priority in the statewide freight plan for addressing a major freight bottleneck. That project is now underway as part of GDOT's Major Mobility Investment Program (MMIP).

Also, just outside the CID study area in Cobb and Douglas Counties, the SR 6 Truck Friendly Lanes project was identified as a priority investment. This project would improve freight mobility and travel time reliability on SR 6 as it connects the Norfolk Southern Austell-Whitaker Yard to I-20. In addition to geometric improvements (e.g., wider shoulders), the project would use ITS and other transportation technologies to improve travel conditions for passengers and freight. Examples include communicating information on travel times using dynamic message signs, freight signal priority, and eliminating dilemma zones for trucks at intersections. The SR 6 Truck Friendly Lanes project is currently in the scoping phase for a No Build Concept Report.

2.1.2 GDOT Georgia State Rail Plan, 2020

2.1.2.1 Objectives and Overview

The GDOT Georgia State Rail Plan was developed for the purpose of guiding the state's rail freight and passenger transportation planning activities and project development plans for the next 20 years. The 2020 Georgia State Rail Plan provided updates to the 2015 Plan on conditions that have changed and important short-term and long-term opportunities for investment including:

- The increasing demand for passenger and freight rail services;
- Upgrades to state owned rail to ensure economic competitiveness; and
- Supporting operational improvements to maximize efficiency of the rail network and multimodal connections.

2.1.2.2 Key Findings

The 2020 Georgia State Rail Plan found that the state's position in freight rail has risen since the 2015 State Rail Plan was completed. Georgia increased in ranking among states in terms of number of freight railroads, originated rail tons, and originated rail carloads. The 2020 State Rail Plan also found that while total freight rail tonnage had decreased, the number of rail carloads had increased with the rise of intermodal traffic in the state.

Additionally, the 2020 Georgia State Rail Plan identified some key opportunities related to freight rail that could impact the CID. The CID does have some shortline rail infrastructure, which was specifically identified

in the Rail Plan as an area of opportunity. However, impacts to the CID would likely be primarily in the form of indirect impacts such as truck trip patterns that increasingly center on intermodal rail terminals due to increased rail connectivity to sea and inland ports:

- **Sea and Inland Ports.** Continued investment in rail connectivity to ports drive the capacity and ability of the rail and port network to increase job growth, attract new commerce, and sustain economic competitiveness.
- **Short Line Improvements.** Investments that upgrade the infrastructure of the short line rail network (such improved weight capacity to handle 286,000 lbs. axle loads) would boost rural economic development and help to divert freight traffic from the state's highway network.
- **Increasing the Usage of Freight Rail.** A single freight train can remove several hundred trucks from Georgia's highways leading to reduced greenhouse gas emissions and improved safety (i.e., the rate of fatalities per ton-mile for rail is substantially lower than trucking).

2.1.2.3 Recommendations

Though the 2020 State Rail Plan did not make recommendations specific to the CID study area, its emphasis on improving the efficiency and usage of freight rail would impact freight-intensive industries in the CID. The 2020 State Rail Plan noted that logistics and supply chain is a key industry supported by rail in Georgia and there are numerous warehouses, distribution centers and truck terminals located in the CID. Often, one or more of the state's intermodal terminals (such as the Norfolk Southern facilities at Inman Yard and Austell, and the CSX facility in Fairburn) are important to their operations.

2.1.3 Transportation Element of the Atlanta Regional Commission Atlanta Region's Plan, 2020

2.1.3.1 Objectives and Overview

The Atlanta Region's Plan is an interdisciplinary long-term set of strategies for maintaining and expanding infrastructure, sustaining, and diversifying the economy and fostering and strengthening healthy livable communities. The Transportation component of the Region's Plan is a fiscally constrained regional vision for transportation and mobility. As such, it serves as the federally compliant Regional Transportation Plan, but also serves a much broader context. The Plan placed a big emphasis on multimodalism by weaving together several supporting plans and studies for transit, walking/cycling, roadways, and freight.

2.1.3.2 Key Findings

The cost to implement the transportation vision defined by the 2020 RTP was estimated at \$170 billion through 2050. The Plan's recommendations place a heavy focus on strategies to maintain and modernize the region's existing transportation system with nearly 60 percent of funding dedicated to projects that help to achieve that objective. The Plan also places an emphasis on managing transportation demand through demand management programs including telecommuting programs, land use planning, and expanding multimodal networks for walking cycling.

2.1.3.3 Recommendations

The Plan identifies the CID study area as a key regional freight generator as well as a focal point for highway-oriented commuting. Project recommendations that are within or proximate to the CID study area include:

- SR 70/Fulton Industrial Boulevard pedestrian enhancements from Lakeview Court to Westpark Place with a target year of 2024;
- I-285 west express lanes from I-20 west to West Paces Ferry Road with a target year of 2040;
- I-20 west express lanes from I-285 west to SR 92/Fairburn Road with a target year of 2040; and
- I-285 at I-20 interchange improvements with a target year of 2030.

2.1.4 Atlanta Regional Commission Freight Plan Update, 2016

2.1.4.1 Objectives and Overview

The goal of the 2016 Atlanta Regional Freight Mobility Plan Update was to enhance the region's economic competitiveness by providing efficient, reliable, and safe freight transportation while maintaining the quality of life in the region's communities. It accounted for the extensive amount of change that occurred since the 2008 plan was completed including impacts from the Great Recession and Federal legislative requirements in 2012's MAP-21 and the Fixing America's Surface Transportation (FAST) Act of 2015. The primary objectives of the Atlanta Regional Freight Mobility Plan Update were to:

- Assess the current plan against the latest understanding of existing conditions and forecasts;
- Update the plan based on the latest federal, state, and Atlanta regional policies;
- Support the development of a FAST Act compliant Regional Transportation Plan (RTP) as it relates to applicable freight provisions;
- Identify projects of national, state, and regional significance; and
- Define a path forward for project investment and establishment of responsive strategies and initiatives.

It should be noted that the Atlanta Regional Commission has begun the process to develop a new regional freight plan to account for the many changes that have occurred since the 2016 update was completed.

2.1.4.2 Key Findings

The 2016 Freight Plan Update projected that freight volumes in the region would substantially increase between 2013 and 2040, implying that significant infrastructure investments would be needed to keep pace with growth. Though much has changed globally and regionally (making the baseline freight volumes on which the Plan's forecasts were based already much different now), the overall trend of substantial growth is believed to still hold true. Other key issues identified in the 2016 Freight Plan Update, such as growth at the Port of Savannah, are still relevant. Importantly, the Freight Plan Update also identified clusters of industries resulting in freight-intensive land uses throughout the Atlanta Region that were considered the drivers of goods movements at the regional level, thus requiring more detailed study and understanding. The Boulevard CID study area was one of the identified freight clusters.

2.1.4.3 Recommendations

The 2016 Freight Plan Update recommended short- and long-term strategies for addressing critical freight needs and deficiencies while mitigating potential impacts. Additionally, it also combined projects from several different sources and prioritized them based on their performance against the plan's goals and objectives. Project recommendations that specifically impact the CID study area include:

- SR 70/Fulton Industrial Boulevard widening;
- Redesign of the I-285/Bolton Road interchange;
- Operational improvements at the intersection of Cascade Road and SR 70/Fulton Industrial Boulevard;
- Operational improvements at the intersections of SR 70/Fulton Industrial Boulevard with the I-20 entry and exit ramps; and
- SR 8/US 78/US 278/Donald L. Hollowell Parkway widening between SR 280/Hamilton Holmes Drive and I-285 to accommodate transit.

2.1.5 Atlanta Regional Commission Truck Parking Study, 2018

2.1.5.1 Objectives and Overview

The need for a regional truck parking study arose, in part, from an identified need in the 2016 Atlanta Regional Freight Mobility Plan. It found that Metro Atlanta lacks truck parking facilities, and that the region should better understand freight mobility issues centered on the lack of truck parking capacity. The regional truck parking study was also motivated because of the then impending federal regulation for electronic logging devices to digitally monitor truck driver hours of service. This meant hours for truck drivers would be more closely regulated, and the need for truck parking would increase to give drivers opportunities for proper rest.

The approach of the 2018 ARC Truck Parking Study was to examine the existing condition of truck parking in the region, identify where there were gaps, and make recommendations. These recommendations came in the form of new policies, new infrastructure, and new partnerships between local governments and trucking companies.

2.1.5.2 Key Findings

Key findings from the study include:

- A general lack of truck parking supply that was projected to worsen as truck volumes increase;
 - A localized lack of truck parking around the region's perimeter (i.e., I-285);
 - Though Fulton County leads the region in truck parking capacity, the complete absence of major truck parking options in Cobb County, north Fulton County, Gwinnett County, and others places a strain on the entire region;
 - The federal requirement for electronic logging devices would increase demand for truck parking in the region even further; and
 - Industries that require transportation of freight by truck will continue to grow in Atlanta, which will increase the demand for truck parking facilities even more.
-

2.1.5.3 Recommendations

Recommendations from the ARC Truck Parking study that impact the CID study area include:

- Requiring an assessment of truck parking needs and challenges as part of comprehensive transportation plans and freight cluster plans;
- With member jurisdictions, assess the need for increasing truck parking supply through options including
 - Expansion of existing truck stops and private lots;
 - Use of vacant industrial spaces and/or brownfield sites;
 - Coordination with shippers/receivers to allow on-site parking;
 - Expansion of existing public facilities; and
 - Use of closed public facilities.
- Sharing parking costs/benefits for new warehousing/distribution developments and other new freight-intensive land uses that generate demand for truck parking;
- Assess the Development of Regional Impact requirements for truck stops as the current thresholds for number of fuel pumping stations and truck parking spaces may be too low and a hindrance to the private sector increasing supply;
- Consider incentivizing off-peak freight operations in Metro Atlanta which would potentially allow truck drivers to seek parking during times in which the demand for truck parking is typically lower;
- Use zoning to develop truck parking facility design standards which, among other benefits, could lessen negative community impacts through the use of buffer landscaping, lighting requirements, and safety/security requirements; and
- Encourage local governments to review/update local zoning ordinances to address truck parking, including expansions of existing facilities and the construction of new facilities.

2.1.6 The Chattahoochee RiverLands Greenway Study, 2020

2.1.6.1 Objectives and Overview

The Chattahoochee RiverLands Greenway Study was a collaborative effort between ARC, Trust for Public Land, Cobb County, and the City of Atlanta to create a new vision for the Chattahoochee River. It established a vision and plan for the 100-mile river corridor which stretches from Buford Dam to Chattahoochee Bend State Park. The plan serves broadly as a corridor master plan as it directs greenspace development and guides investment within the study area. Importantly, the RiverLands Greenway Study called for the development of a network of greenspace and multi-use trails along the Chattahoochee River, including the portion in the CID study area.

2.1.6.2 Key Findings

The CID study area was identified in the RiverLands Greenway Study as Urban Core (Sub-Area 2) and noted that it is defined by industrial land uses. The study further observed that utility easements could be used to facilitate greenway alignments along the river's edge, mitigating the current lack of public access to the riverside. Furthermore, it noted that residential communities (even those close to the water) typically lack access to the Chattahoochee River and its resources. The industrial structures along SR 70/Fulton Industrial Boulevard act as a wall, separating neighborhoods like Monroe Heights, Riverside, Bolton, and

Collier Heights from the Chattahoochee River. During stakeholder outreach sessions, the public expressed interest in connecting regional trails, tributaries, public transit hubs, and existing community assets like parks, schools, and libraries to the river.

2.1.6.3 Recommendations

The RiverLands Greenway Study recommended that the preferred alignment of greenway go through the CID study area along the banks of the Chattahoochee River. The alternative alignment is still within the CID study area, but along SR 70/Fulton Industrial Boulevard. Potentially, multi-use trails could be developed along both which would greatly enhance pedestrian and bicycle mobility within the study area.

Additionally, the RiverLands Greenway Study recommended the development of the Proctor Creek Trail Extension. The Proctor Creek Trail Extension would extend the existing Proctor Creek Greenway to the Chattahoochee River in a way that protects ecologically sensitive areas while educating visitors about the importance of waterway health. Based on the preferred alignment, the Proctor Creek Trail Extension would connect with the Chattahoochee River within the CID study area near the I-285 bridge over the river.

2.2 Comprehensive Transportation Plans

2.2.1 Southern Fulton Comprehensive Transportation Plan, 2020

2.2.1.1 Objectives and Overview

The Southern Fulton Comprehensive Transportation Plan (SFCTP) is the long-term transportation investment plan for the south Fulton County portion of the Atlanta Region. It includes the Cities of Chattahoochee Hills, College Park, East Point, Fairburn, Hapeville, Palmetto, South Fulton, and Union City. It also includes the unincorporated portion of Fulton County in which much of the CID has been located. The SFCTP is an important input to the regional transportation planning process as it evaluated current and future transportation conditions in the study area and determined the multimodal transportation needs through the year 2050. It developed a recommended list of transportation projects to be implemented in the near-term (1-5 years), mid-term (6-10 years), and long-term (11 or more years) for south Fulton County. The SFCTP was most recently updated in September 2020.

2.2.1.2 Key Findings

A key finding from the SFCTP was that the CID study area has multiple corridors that are important for freight mobility (i.e., Economic Freight Corridors). Furthermore, the SFCTP determined that the investments needed on these corridors should focus on improving freight and economic activity. Examples of investments include freight signal priority, targeted roadway capacity improvements, reducing at-grade crossings, truck parking, raised medians, and intersection and roadway geometric modifications to better accommodate trucks. The SFCTP designated multiple corridors throughout south Fulton County as Economic Freight Corridors including SR 70/Fulton Industrial Boulevard in the CID study area.

The SFCTP also designated SR 70/Fulton Industrial Boulevard as a Smart Corridor. Smart Corridors are those where technology solutions to safety and mobility issues are especially relevant. Examples of these solutions include automated parking systems, electric vehicle charging stations, signal priority for transit and/or freight, and transit-pedestrian warning systems.

2.2.1.3 Recommendations

The SFCTP made multiple recommendations that impact the CID study area. For unincorporated south Fulton County (which has contained the CID), over half of the recommended projects in the fiscally constrained project list were operational improvements (e.g., traffic operations improvements at intersections, access management). About one-third of recommended projects were transit related (e.g., new transit capacity, transit stop or station amenities).

Some examples of project recommendations impacting the CID study area include:

- A feasibility study for a new roadway facility parallel to the north of SR 6/Camp Creek Parkway from SR 70/Fulton Industrial Boulevard to Butner Road;
- Widen SR 154/Campbellton Road to four lanes between SR 70/Fulton Industrial Boulevard and Reynolds Road;
- Widen SR 70/Fulton Industrial Boulevard from four to six lanes between SR 154/Campbellton Road to SR 6/Camp Creek Parkway;
- Streetscaping to include bicycle and sidewalk facilities on SR 70/Fulton Industrial Boulevard between Frederick Drive to Riverside Drive; and
- Arterial rapid transit on SR 6/Camp Creek Parkway from the College Park MARTA station to SR 70/Fulton Industrial Boulevard.

2.2.2 Connect Atlanta Comprehensive Transportation Plan, 2008

2.2.2.1 Objectives and Overview

The Connect Atlanta Plan is the CTP for the City of Atlanta. As the CTP, it guides the city's transportation investments over the long-term. The Connect Atlanta CTP was completed in 2008 with additional appendices added in 2015 that incorporated follow-up studies on transit-oriented development and truck routes, among others. Though only small portions of the CID's freight network are located in the City of Atlanta, some of the CTP's key findings and recommendations are relevant to the freight cluster plan.

2.2.2.2 Key Findings

The Connect Atlanta Plan outlined some key findings as they pertain to transit, pedestrian and bike infrastructure, freight, and other areas. Some of these key findings are summarized below:

- The provision of transit has not kept pace with the City of Atlanta's growth. Improving the city's transit services is a priority for keeping up with population growth and offering more modal options to residents.
 - It is important to promote sustainable transportation modes by improving and expanding pedestrian and bicycle infrastructure.
 - The Connect Atlanta Plan determined that improvements to network connectivity and developing effective goods movement strategies were essential to addressing congestion. It observed that Atlanta lacks a redundant network of streets that allow people to choose different routes. Regarding freight, the Connect Atlanta Plan determined that updating the city's truck route map, preserving
-

freight rail corridors, and incentivizing increased track capacity within existing corridors should be priorities.

In addition, a 2015 update of the Connect Atlanta Plan adopted as a technical appendix the Cargo Atlanta freight study. This study updated the City of Atlanta's truck route network as well as identified additional transportation improvements directed at freight mobility.

2.2.2.3 Recommendations

Recommendations from the Connect Atlanta Plan that impact the CID include the following:

- Bus Rapid Transit extension of MARTA's west line on new high-occupancy vehicle lanes on I-20 with transit stations at SR 139/Martin Luther King Jr. Drive and SR 70/Fulton Industrial Boulevard.
- New 2-lane street connecting SR 70/Fulton Industrial Boulevard and Bolton Road near the intersection of Bolton Road and Bolton Parkway.
- Widen SR 8/US 78/US 278/ Donald L. Hollowell Parkway from 2 lanes to 5 lanes to accommodate transit and freight from the Bankhead MARTA station to I-285.

Other recommendations that would impact the CID were completed or have already begun, such as signal timing revisions for the Bolton Road at SR 8/US 78/US 278/Donald L. Hollowell Parkway intersection and modifications to the I-285 at SR 8/US 78/US 278/ Donald L. Hollowell Parkway interchange.

2.2.3 Cobb County Comprehensive Transportation Plan Update: 2040, 2015

2.2.3.1 Objectives and Overview

Though outside of the CID study area, the Cobb County Comprehensive Transportation Plan 2040 (CTP 2040) was also reviewed as the CID shares with Cobb County some regional freight corridors (e.g., SR 6, US 78/US 278, SR 139). The CTP 2040 serves as the blueprint for all transportation investments by Cobb County and its municipalities for the next 25 years. It identified a variety of transportation investments for Cobb County, some of which potentially impact the CID.

2.2.3.2 Key Findings

A key finding from the CTP 2040 was the need to improve performance along major freight corridors in order to maintain economic competitiveness. Specifically, the CTP 2040 identified needs related to congestion on freight corridors, locations with high frequencies of truck crashes, and reducing the number of at-grade crossings. Furthermore, it stressed the need to replicate innovative solutions, such as the SR 6 Truck Friendly Lanes project currently being implemented by GDOT, on other freight corridors in the county.

2.2.3.3 Recommendations

Recommended improvements in the CTP 2040 that potentially impact the CID study area include:

- Interchange Improvements at I-20 and Riverside Parkway;
 - Interchange improvements at I-20 and Six Flags Parkway
 - Truck friendly lanes improvement projects on SR 6 from Luke Glenn Garrett Jr. Memorial Highway to the Douglas County Line; and
-

- Widening SR 139 from four to six lanes between Dodgen Road and US 78/US 278.

2.2.4 Douglas County Comprehensive Transportation Plan, 2008

2.2.4.1 Objectives and Overview

The Douglas County CTP identified transportation needs and implementation strategies for Douglas County. Despite being outside the CID study area, substantial portions of the CID border Douglas County and they share major freight corridors such as SR 6 and SR 154/166. It is important to note that the most recent CTP for Douglas County was completed in 2008 and the county is in the process of performing an update.

2.2.4.2 Key Findings

A key finding of the Douglas County CTP was that the southeastern quadrant of Douglas County (including parts of the City of Douglasville) is becoming one of the major freight distribution centers in the north Georgia region (i.e., the SR 6 Industrial Subarea). The Douglas County CTP further observed that the SR 6 Industrial Subarea has a unique character and needs due to the prevalent industrial land uses, primarily in the form of warehousing and distribution. The area borders and has easy access to the Fulton Industrial Boulevard district, I-285, I-20, and the Norfolk Southern Whitaker-Austell intermodal terminal which promotes the continued development of industrial land uses.

2.2.4.3 Recommendations

Some of the recommended improvements in the Douglas County CTP could impact the Boulevard CID. For instance, it recommended widening SR 154/166/Fairburn Road to 4 lanes between SR 92 to SR 70/Fulton Industrial Boulevard. The Douglas CTP also recommended designating I-20, US 78, and SR 166 as truck routes in the Unified Development Code. Neither of these recommendations appear to have been completed.

2.3 Comprehensive Plans

2.3.1 2035 Fulton County Comprehensive Plan, 2016

2.3.1.1 Objectives and Overview

Comprehensive plans are long-term documents that provide a vision for the future and help to guide the growth of a community. They act as a management tool to guide the decision-making process for land use, housing, transportation, the environment, and public facilities including public parks, community and recreation centers, and trails. The CID has been primarily within unincorporated Fulton County with small portions within the Cities of Atlanta and South Fulton. However, with the passage and signing by the Governor of House Bill 445, the CID is primarily within the City of South Fulton with the portion north of I-20 in the City of Atlanta and Fulton County Airport remaining in unincorporated Fulton County¹. The City of

¹ Brasch, B. "South Fulton gets Fulton Industrial, spells end for unincorporated land," Atlanta Journal-Constitution, May 13, 2021, <https://www.ajc.com/news/atlanta-news/south-fulton-gets-fulton-industrial-spells-end-for-unincorporated-land/B7QHR2JLZZAJXF67VIOVS762OQ/>.

South Fulton is in the process of developing its first comprehensive plan, but for now relies on the 2035 Fulton County Comprehensive Plan.

2.3.1.2 Key Findings

The 2035 Fulton County Comprehensive Plan emphasized the need for improved transit connectivity to the CID, especially the SR 70/Fulton Industrial Boulevard corridor given its concentration of jobs. Additionally, the 2035 Fulton County Comprehensive Plan stressed the importance of the Fulton County Railway (FCR) to the region as it owns and operates over 33 miles of track within unincorporated Fulton County, 22 miles of which lie within the Fulton County Industrial Park.

An important aspect of the 2035 Fulton County Comprehensive Plan was its long-term vision for future land uses within the CID. It articulated that future land uses would remain consistent with current development patterns that are primarily industrial (e.g., manufacturing, warehousing). At key nodes along the SR 70/Fulton Industrial Boulevard corridor (at I-20, SR 6/Camp Creek Parkway, and SR 154/Campbellton Road), the 2035 Fulton County Comprehensive Plan designated industrial marketplace as the future land use. The industrial marketplace character area designation is intended to concentrate commercial activity at certain nodes along the SR 70/Fulton Industrial Boulevard corridor to serve the needs of employees and nearby residential neighborhoods. Commercial and retail services, such as convenience retail and shopping centers, may be included within industrial marketplace character areas. They may also include industrial uses such as wholesale trade distribution centers. Because of their proximity to intense industrial areas, the industrial marketplace does not accommodate residential uses.

2.3.1.3 Recommendations

Multiple recommendations were made as part of the 2035 Fulton County Comprehensive Plan that impact the CID study area. An example includes the recommendation for greater partnership between Fulton County and MARTA for future transit expansions into the CID study area. The comprehensive plan noted that a MARTA study found that Route 73-Fulton Industrial has the potential to accommodate extended length articulated buses that would provide higher ridership capacity.

Other recommendations included addressing the needs of residential communities within and neighboring the CID, such as redevelopment that adds activities and trail connections along the Chattahoochee River. The 2035 Fulton County Comprehensive Plan also recommended implementing gateway signage and streetscape improvements along the SR 70/Fulton Industrial Boulevard corridor and supporting/targeting areas of revitalization for attracting new businesses. In addition, the comprehensive plan recommended that strategies be developed to mitigate conflicts between industrial and non-industrial land uses.

2.3.2 City of Atlanta Comprehensive Development Plan, 2016

2.3.2.1 Objectives and Overview

The City of Atlanta Comprehensive Development Plan outlined the strategy for sustaining and improving the city's economic competitiveness, transportation network, and land uses over the long term. Key topics addressed in the Comprehensive Development Plan included demographic trends, economic development, housing, natural resources, historic resources, community facilities, transportation, urban design, and land use. The City of Atlanta Comprehensive Development Plan was most recently updated in 2016. Only a

small portion of the CID is located in the City of Atlanta. However, some of the Comprehensive Development Plan's key findings and recommendations are relevant to the freight cluster plan.

2.3.2.2 Key Findings

The Comprehensive Development Plan outlined some critical transportation needs for the City of Atlanta. Some that are relevant to the CID include the following:

- Traffic congestion;
- Insufficient connectivity between pedestrian, bicycle, transit, and roadway modes; and
- Conflicts due to the close proximity of freight infrastructure to neighborhoods and other areas sensitive to its impacts.

Regarding land use, the Comprehensive Development Plan also outlined some needs for the City of Atlanta that are relevant to the CID. For instance, it observed that industrial uses are being lost and redeveloped for non-industrial uses. It also noted that residential and mixed-use developments in industrial areas are creating land use conflicts.

2.3.2.3 Recommendations

A key recommendation from the Comprehensive Development Plan was the use of future land use designations to encourage revitalization along key corridors that serve the CID, namely SR 8/US 78/US 278/Donald L. Hollowell Parkway. For instance, the 5 miles of SR 8/US 78/US 278/Donald L. Hollowell Parkway between the Bankhead MARTA station and the city limits was designated a redevelopment area (i.e., an area that qualifies for redevelopment based on indications of slum and blight²). Furthermore, it adopted the D. L. Hollowell Parkway Redevelopment Plan which encourages commercial, residential, and other future development along the corridor. This policy is reflected in the designated future land uses for the corridor which include high density commercial and mixed use.

2.3.3 Cobb County 2040 Comprehensive Plan, 2017

2.3.3.1 Objectives and Overview

The Cobb County 2040 Comprehensive Plan (Cobb 2040) developed the county's long-term strategy for growth and development. The plan is also intended to assist Cobb's elected leaders in recognizing the need for, and the subsequent implementation of, important economic development and revitalization initiatives. As a neighboring jurisdiction, the long-term land use patterns articulated in Cobb 2040 have the potential to influence travel and development patterns in the CID.

2.3.3.2 Key Findings

Regarding transportation, Cobb 2040 echoed many of the findings of CTP 2040. Specifically, it determined that there is a need for increased capacity and/or improved operations along major truck freight routes through Cobb County. These include corridors shared with the CID such as SR 6, SR 139, and US 78/US 278.

² Official Code of Georgia Annotated, Title 36, Chapter 44.

Regarding land use, Cobb 2040 proposed future land use designations are largely consistent with the existing industrial land uses that border the CID. Notably, it designated much of the land bordering the CID as a priority industrial area (PIA) future land use. The PIA future land use designation works to preserve industrial land through a policy that applies more stringent criteria to requests to alter the land use of a PIA. Example criteria include the estimated impact to jobs, the tax base, and potential negative impacts to adjacent industrial areas.

2.3.3.3 Recommendations

Among other recommendations, the Cobb 2040 Comprehensive Plan recommended continued investment in the county's multimodal freight network. This included increased capacity and/or improved operations along major truck freight routes, evaluating safety needs at high-truck crash locations, and reducing at-grade railroad crossings. Regarding land use, Cobb 2040 recommended preserving industrial land uses for their ability to provide local jobs and contribute to the economy. It also recommended promoting development patterns that encourage an active lifestyle by providing access to open space.

2.3.4 Douglas County Comprehensive Plan Update, 2018

2.3.4.1 Objectives and Overview

The Douglas County Comprehensive Plan serves as the county's blueprint for development and growth over the next 20 years. It outlines transportation and land use policies to meet the county's needs over the long term. The Douglas County Comprehensive Plan was most recently updated in 2018 and contains some findings and recommendations that are relevant to the CID study area.

2.3.4.2 Key Findings

The Douglas County Comprehensive Plan identified its varied housing choices, growing cultural/recreational areas, water resources, and location all as valuable assets. However, it noted that the county is faced with challenges related to transportation and population growth. Specifically, the comprehensive plan identified workforce development as a challenge and stated that improved transportation access to existing employers is needed. It also determined that there is a need to target industry sectors that are suited to local resources and regional assets. The growing number of firms in the SR 6 Industrial Subarea which borders the CID is an example of this. Additionally, the comprehensive plan determined that preserving rural areas while allowing for growth and the provision of senior services are challenges.

2.3.4.3 Recommendations

An important recommendation made by the Douglas County Comprehensive Plan was that future land uses in the Sweetwater area (which is roughly between SR 6/Thornton Road to SR 154/Fairburn Road and encompasses the SR 6 Industrial Subarea), better balance industrial and residential land uses. The comprehensive plan encouraged future land uses that emphasize greenspace, reduce conflicts between freight and non-freight transportation modes, and provide amenities to residents and employees in the area. To that end, the Douglas County Comprehensive Plan designated the future land use for this area as mixed-use. Furthermore, it called for a combination of residential, hospitality, retail, and industrial land uses for the portion of Douglas County bordering the CID.

2.4 Local Plans

2.4.1 Economic and Fiscal Impact Analysis of the Fulton Industrial District Study, 2018

2.4.1.1 Objectives and Overview

The Draft Economic and Fiscal Impact Analysis of the Fulton Industrial District Study, completed in August 2018, quantified the economic and fiscal impact of the Fulton Industrial District on the jurisdictions and municipalities to which it contributes. These include Fulton County, Fulton County Schools, the City of South Fulton, the City of Atlanta, Atlanta Public Schools, and the State of Georgia. The report performed two key analyses:

- An economic impact analysis which measured economic activity, both direct and indirect, of the Fulton Industrial District.
- A fiscal impact analysis which compared the public revenues generated by the Fulton Industrial District to the cost of providing government services to the area.

Importantly, the analysis measured these impacts over the Fulton Industrial District (i.e., the 2018 boundaries of the Boulevard Community Improvement District) and its area of influence (AOI). The AOI included all land within the CID boundaries along with two additional areas that operate as part of the district's economic ecosystem: (1) the Atlanta Industrial Park in the City of Atlanta and (2) industrial areas in the City of South Fulton adjacent to the FID where a substantial number of parcels participate in the CID. Note that some of these areas, such as the Atlanta Industrial Park, are now within the formal boundaries of the CID.

2.4.1.2 Key Findings

The economic impact analysis component of the study examined how the CID and its investments affected the local economies of its municipal partners. This analysis examined factors including but not limited to jobs (e.g., number of jobs, wages, payroll), commerce (e.g., retail activity), and revenue (e.g., property taxes, sales taxes). It found that the study area (i.e., the Fulton Industrial District and its AOI) have a significant direct impact on the Metro Atlanta economy, both in terms of the direct employment and sales that occur within the region, as well as substantial indirect and induced impacts. Specifically, it found that:

- There are over 1,000 businesses in the study area that directly employ over 28,000 people. This employment activity induces an additional 41,000 jobs, leading to total employment effects of 69,000 jobs regionally.
 - The combined direct payroll in 2018 was estimated to be \$2.37 billion, indicating an average wage of nearly \$84,500 across all industries.
 - Business activity in the study area was estimated to generate a direct contribution of \$15.3 million in 2018 with an induced additional indirect impact of \$15.8 million. Combined, this resulted in a total economic output of \$31.1 million.
-

- The study area's estimated impact on Gross Regional Product is more than \$18.8 billion, which accounts for employment, direct and indirect economic output, and multiplier effects for demand in related industries.

Regarding fiscal impacts, the study estimated that the study area generates substantially more revenue for Fulton County and Fulton County Schools than it consumes in services. Specifically, it found that:

- Fulton County receives \$18.2 million in revenue annually from the study area (e.g., the Fulton Industrial District and its AOI), while the total cost to provide County services to the study area was estimated to be \$7.2 million annually. This results in an estimated annual net surplus of \$11.1 million to Fulton County.
- Fulton County Schools receives over \$12.4 million in revenues annually from the study area, while the local share of education costs was estimated to be \$2.3 million. This results in a net surplus of \$10.1 million to Fulton County Schools.
- Overall, the study area contributes \$3.20 in local revenues to Fulton County and Fulton County Schools for every \$1.00 worth of services received.

2.4.1.3 Recommendations

The Draft Economic and Fiscal Impact Analysis of the Fulton Industrial District Study did not make specific recommendations for policies or projects, but it did demonstrate how investments made in the CID to address transportation and other challenges generate a significant economic return. For example, besides the approximate \$5.5 million in improvements directly funded by the Boulevard CID between 2013-2018, the CID has leveraged about \$8.7 million in grants and matching funds for various other improvement projects (e.g., transportation, landscaping, beautification). Furthermore, these investments have far-reaching impacts beyond its boundaries and include not just transportation impacts (e.g., reduced travel times, improved roadway safety), but also positive economic and fiscal impacts to local schools and the CID's municipal partners.

2.4.2 Fulton Industrial Community Improvement District Master Plan, 2013

2.4.2.1 Objectives and Overview

Recognizing the need for strategic and targeted investment in the CID area to revive its role as a center of industrial and freight-related commerce, public and private leaders developed the CID's 2013 Master Plan. The Master Plan provided an implementation-focused vision for the area's future and established the key steps needed to achieve that vision. It developed a comprehensive set of recommendations for transportation improvements, land use, economic development, and design/aesthetic treatments.

2.4.2.2 Key Findings

A key finding from the 2013 Master Plan was that truck operations took a heavy toll on the CID's infrastructure, primarily in the form of damaged medians and sidewalks resulting from insufficient turning radii at intersections. It also observed relatively high crash rates along SR 70/Fulton Industrial Boulevard near its interchange with I-20. Portions of key corridors throughout the CID (namely SR 70/Fulton Industrial Boulevard, SR 139/Martin Luther King Jr. Drive, SR 6/Camp Creek Parkway, SR 154/Campbellton Road, SR 154/Campbellton Road,

I-20, and I-285) were found to operate under congested travel conditions. The Master Plan noted that traffic volumes in the study area were projected to increase substantially by 2040, potentially worsening existing challenges.

Regarding land use, the 2013 Master Plan found that the Regional Mixed Use, Community Mixed Use and Suburban Neighborhood Residential character area designations found in portions of the CID could be detrimental to industrial development and rehabilitation as new residential developments would erode the industrial foundation of the district. Mitigating steps would be needed to prevent this from occurring. The Master Plan also noted that commercial development focused at key nodes in the CID could help to transition between industrial and non-industrial land uses and also provide needed amenities for employees.

2.4.2.3 Recommendations

The Master Plan made several recommendations that the CID has been implementing since the plan's completion. Many of those recommendations are relevant to this freight cluster plan. Some examples include:

- **Policy.** These recommendations included encouraging development consistent with the Master Plan by coordinating with the Fulton County Department of Planning and Zoning and revising the Fulton County Zoning Ordinance as necessary.
- **Infrastructure.** The 2013 Master Plan recommended targeted intersection improvements to improve freight mobility through median and radii adjustments, traffic signal timing adjustments, sidewalk and crosswalk installations, signage, and wayfinding installations, streetscaping, and the installation of sustainability-focused infrastructure elements such as native vegetation and bio-swales.
- **Funding.** These recommendations included identifying partners and coordinating with regional and state entities to pursue funding. Since the 2013 Master Plan was completed, other funding sources and partners (such as the Georgia Commission on Freight and Logistics) have become available and should be explored as part of the freight cluster plan.

2.4.3 Fulton County Executive Airport Technical Assistance Panel Report, 2020

2.4.3.1 Objectives and Overview

In coordination with the Urban Land Institute (ULI) Atlanta's Technical Assistance Panel (TAP), Fulton County conducted the Fulton County Executive Airport Technical Assistance Report in 2020 for the purpose of developing viable redevelopment strategies for the airport site. This included funding strategies and an implementation plan. As the forthcoming Airport Master Plan will focus primarily on improving areas on and adjacent to property owned by Fulton County, the TAP Report will help Fulton County to identify priorities and appropriate redevelopment opportunities to pursue as part of the Airport Master Plan.

2.4.3.2 Key Findings

Some key findings from the TAP Report include the following:

- The airport has several strengths that can be leveraged for economic growth. These include access to the Interstate system and regional centers (e.g., Downtown, Cumberland, Perimeter Center), a
-

substantial amount of county-owned land available for redevelopment, and proximity to the Chattahoochee River, among others.

- The TAP report identified multiple challenges that limit the airport's ability to grow economically. Examples include the visual appearance of the area surrounding the airport, lack of services for airport users, perception of crime in the area, and lack of class A industrial buildings. In addition, the TAP Report identified congestion on SR 70/Fulton Industrial Boulevard and I-20 as a limiting factor for economic development.
- The potential for development on Aviation Circle that incorporates the existing Cultural Center was cited as an opportunity for the airport in the TAP Report. The report determined that development featuring a mix of land uses would create a focal point at the airport and improve its economic competitiveness. Furthermore, regional efforts to extend MARTA service further into the area around the airport and to create a network of multi-use trails and greenspace around the Chattahoochee River (i.e., the ARC's RiverLands Plan) are also important opportunities.

2.4.3.3 Recommendations

Six major recommendations were developed by the TAP Report:

- **Create a sense of place.** The TAP Report recommended that the Fulton County Executive Airport be used to create a sense of place for the SR 70/Fulton Industrial Boulevard corridor. This would be achieved by creating a main street for the area by developing land around the airport. It would also entail introducing a mix of land uses to the airport campus, contributing to the region's efforts to create a network of greenspace around the Chattahoochee River, and streetscape improvements.
 - **Leverage Aviation Community Cultural Center.** The TAP Report observed that the Aviation Community Cultural Center is an underutilized resource. It recommended organizing a committee be to assess the center's potential and craft a vision and strategic plan to maximize the facility's use.
 - **Provide convenience retail and amenity space.** The need for commercial amenities within the area was frequently raised as an issue during stakeholder interviews conducted as part of the TAP Report. It recommended that future development in the area provide restaurants, grocery stores, fitness centers, and other service businesses.
 - **Recruit office or flex-type use.** The TAP Report recommended that the area's roles as a logistics hub could be used to attract office developments of related industries (e.g., freight forwarding, aerospace, manufacturing).
 - **Seek potential partnerships with colleges and universities that focuses on aerospace and logistics.** Though targeting specific industries for location and expansion in the Fulton County airport footprint is the TAP Report's primary goal, it also recommended that steps be taken to develop the workforce required for those industries to succeed.
 - **Evaluate the long-term potential for a hotel.** Over the mid- to long-term, there could be an opportunity for a hotel on county-owned property. The county could facilitate such a deal by leveraging or creating a tax incentive.
-

2.4.4 Neighborhood Planning Unit G (NPU-G) Master Plan, 2010

2.4.4.1 Objectives and Overview

Neighborhood Planning Unit G (NPU-G) contains 12 neighborhoods and is located along the western boundary of the City of Atlanta. Within the CID, the NPU-G Master Plan study area included the portions of the CID north of SR 8/US 78/US 278/Donald L. Hollowell Parkway (i.e., Atlanta Industrial Park, the English Park neighborhood of the City of Atlanta). The NPU-G Master Plan serves as the blueprint for growth and economic development for its constituent neighborhoods.

2.4.4.2 Key Findings

The NPU-G Master Plan observed that the area suffers from poor connectivity. While some of the community's connectivity challenges stem from natural features (e.g., Proctor Creek, hilly terrain), others are man-made (e.g., I-285, freight rail lines). Because of the community's poor connectivity, residents have few modal options beyond automobiles or buses. Furthermore, the NPU-G Master Plan noted that the community severely lacks sidewalk and bicycle infrastructure. To address these challenges, the NPU-G Master Plan proposed that multiple investments be made to improve and expand the bicycle and pedestrian network, create new street connections, improve operations on major roadway corridors, and add new public transit options.

2.4.4.3 Recommendations

Several recommendations were made as part of the NPU-G Master Plan for improving transportation mobility. Primarily, these recommendations address the connectivity challenges observed in the study. They include the development of the Proctor Creek Greenway and Chattahoochee River Greenway multi-use trail systems, upgrading existing pedestrian and bicycle infrastructure and closing gaps in the bike/pedestrian network, transit investments to improve multimodal access, and addressing intersection and corridor-level travel time performance challenges where they exist. Some specific recommendations made in the NPU-G Master Plan that would impact the CID include the following:

- Update traffic signal timing on SR 8/US 78/US 278/Donald L. Hollowell Parkway to increase intersection efficiency and travel time reliability;
- Implement signal priority based on vehicle height on SR 8/US 78/US 278/Donald L. Hollowell Parkway to improve travel time reliability for heavy vehicles;
- I-285 creates a barrier between the NPU-G community and job opportunities in the Atlanta Industrial Park. Create a connection between NPU-G and the Atlanta Industrial Park, potentially by connecting Northwest Drive; and
- Implement bus rapid transit along SR 8/US 78/US 278/Donald L. Hollowell Parkway from the Bankhead MARTA station to the Atlanta Industrial Park.

2.4.5 Adamsville Neighborhood Planning Unit H (NPU-H) Master Plan, 2020

2.4.5.1 Objectives and Overview

Neighborhood Planning Unit H (NPU-H) contains 17 neighborhoods and is located in the western portion of the City of Atlanta. Within the CID study area, portions of major corridors (such as SR 8/US 78/US

278/Donald L. Hollowell Parkway, Bolton Road, and SR 70/Fulton Industrial Boulevard) border or are within NPU-H. The Adamsville NPU-H Master Plan represents the collective vision for the future of NPU-H's neighborhoods. It is a strategy for its residents, businesses, and other stakeholders to spur growth and development. The plan of action articulated in the NPU-H Master Plan aims to preserve and protect the quality of life while promoting growth in appropriate areas by building on the community's existing assets and identifying catalytic sites and projects that will encourage redevelopment.

2.4.5.2 Key Findings

The NPU-H Master Plan observed that the street network of NPU-H is disconnected, which limits pedestrian mobility. Furthermore, it found that there is a lack of lighting and pedestrian infrastructure on major corridors. Bolton Road and SR 139/Martin Luther King Jr. Drive were identified in the Master Plan as priority corridors for improving lighting.

Regarding land use, the NPU-H Master Plan observed that current zoning for some parcels differs from the designated future land use which may hinder the potential for redevelopment. Some areas within the CID were specifically identified for redevelopment by the NPU-H Master Plan. These include the area around Bolton Road near the Fulton County Airport and the former Bankhead Courts housing site on SR 8/US 78/US 278/Donald L. Hollowell Parkway between Bolton Road and the Chattahoochee River.

2.4.5.3 Recommendations

Several recommendations were made as part of the NPU-H Master Plan that are relevant to the CID. For instance, multiple recommendations call for additional study of transportation-related needs such as streetscape improvements and partnering with MARTA to ensure that bus stops are improved as new development occurs. However, the recommendations that are potentially most impactful to the CID are those related to land use. Specifically, the NPU-H Master Plan recommended changing the future land use along Bolton Road between SR 8/US 78/US 278/Donald L. Hollowell Parkway and Sandy Creek, which is east of the CID's boundaries. At this node, the master plan recommended that future land use be changed from medium-density residential to a combination of high-density residential and mixed-use. The intent of this recommendation was to encourage a mix of housing types and mixed-use development that could include office and retail uses. In addition, the recommendation called for developing multi-use trails along Sandy Creek on the land owned by Fulton County.

2.4.6 D.L. Hollowell Parkway/Veterans Memorial Highway Livable Centers Initiative Study, 2010

2.4.6.1 Objectives and Overview

The D.L. Hollowell Parkway/Veterans Memorial Highway Corridor Livable Centers Initiative (LCI) Study was a joint planning effort by the City of Atlanta and Cobb County. The purpose of the LCI Study was to build upon previous studies, evaluate multi-modal transportation alternatives, encourage employment opportunities, and improve connectivity to improve the safety and mobility within the study corridor. Within the CID, the LCI study area included the portions of the CID north of the UPS SMART Hub (i.e., Atlanta Industrial Park, the English Park neighborhood of the City of Atlanta, and portions of the SR 8/US 78/US 278/Donald L. Hollowell Parkway and Bolton Road corridors).

2.4.6.2 Key Findings

The D.L. Hollowell Parkway/Veterans Memorial Highway LCI Study noted some key challenges that are specific to portion of the SR 8/US 78/US 278/Donald L. Hollowell Parkway that traverses the CID study area. These included the need for redevelopment of under-utilized parcels and declining businesses, rehabilitation of aging and obsolete commercial building stock along SR 8/US 78/US 278/Donald L. Hollowell Parkway, upgrades to pedestrian and bike infrastructure, and improvements to transit infrastructure and service availability. The D.L. Hollowell Parkway/Veterans Memorial Highway LCI Study also observed the need to balance industrial and residential uses/activities and truck traffic with other commuter traffic. Despite the corridor's challenges, the LCI Study noted the great potential to address them given the area's considerable assets including easy access to I-285 and I-20, job opportunities in the Boulevard CID, proximity to Fulton County Charlie Brown Airport, accessibility to MARTA, and proximity to Atlanta Downtown.

2.4.6.3 Recommendations

Several land use and transportation recommendations were made by the D.L. Hollowell Parkway/Veterans Memorial Highway LCI Study. These included operational improvement projects to reduce traffic congestion and limit conflicts between trucks and other roadway users; connectivity projects to improve accessibility and traffic circulation; pedestrian and bicycle projects to install new sidewalks, lighting, street furniture, bus stops, signage, and trees; and transit projects to extend MARTA bus routes, add stops, provide bus stops/signage, and to pursue bus rapid transit or other high-capacity transit options.

Some specific recommendations from the D.L. Hollowell Parkway/Veterans Memorial Highway LCI Study that are relevant to the CID include:

- Widen SR 8/US 78/US 278/Donald L. Hollowell Parkway to provide 2 through lanes in each direction between Harwell Road and SR 280/James Jackson Parkway;
- Construct a new roadway to connect Bolton Road to Atlanta Industrial Parkway;
- Re-time and install video detection at signals on SR 8/US 78/US 278/Donald L. Hollowell Parkway between Atlanta Industrial Parkway and Harwell Road; and
- Install ITS including video monitoring along SR 8/US 78/US 278/Donald L. Hollowell Parkway.

Of the recommendations provided as examples, many do not appear to have been completed. For instance, SR 8/US 78/US 278/Donald L. Hollowell Parkway is primarily a 2-lane roadway between Harwell Road and SR 280/James Jackson Parkway. Also, there is no connecting roadway between Bolton Road and Atlanta Industrial Parkway. However, there is video monitoring along SR 8/US 78/US 278/Donald L. Hollowell Parkway.

2.5 Other Ongoing Projects and Initiatives

2.5.1 Fulton County Transportation Special Purpose Local Optional Sales Tax (TSPLOST)

In 2016, the Georgia Legislature passed Senate Bill 369 authorizing counties to consider a Special Purpose Local Option Sales Tax for transportation purposes (TSPLOST).³ On November 8, 2016, Fulton County residents outside the City of Atlanta voted to approve a 0.75-cent sales tax for transportation purposes. Approximately \$655 million was estimated to be generated from the tax over its 5-year life span. TSPLOST funds can be spent only on transportation improvements such as roads, bridges, sidewalks, bicycle paths, and other transportation-related purposes included in the legislation. The City of South Fulton manages TSPLOST projects within its boundaries including the Boulevard CID.

Ongoing TSPLOST projects within the Boulevard CID are primarily in the areas of operations and safety, pedestrian and bicycle network improvements, and streetscaping.⁴ They include sidewalk improvements on Cascade Road and SR 70/Fulton Industrial Boulevard within the Boulevard CID. Ongoing TSPLOST projects also include an intersection analysis of SR 70/Fulton Industrial Boulevard with Cascade Road to identify congestion and geometric improvements. There are multiple TSPLOST projects, primarily sidewalk improvements and roadway resurfacing, being completed in the communities neighboring the CID.

2.5.2 Renew Atlanta-TSPLOST

In 2015, City of Atlanta residents voted to support a \$250 million bond, Renew Atlanta, to address the city's estimated \$1 billion backlog of needed facilities and infrastructure improvements.⁵ For transportation, the Renew Atlanta bond included projects such as complete streets, bridge repair/replacement, resurfacing, and sidewalks, among others. The following year, Atlanta residents approved a TSPLOST which was estimated to generate approximately \$260 million to fund transportation projects citywide. Projects approved as part of both measures are managed by the City of Atlanta under its Renew Atlanta-TSPLOST program.

There are a few ongoing Renew Atlanta-TSPLOST projects within or bordering the Boulevard CID.⁶ These are primarily complete streets projects which are intended to prioritize safety, comfort, and accessibility for all roadway users. For example, the Cascade Road complete streets project is in its design phase and will include resurfacing, restriping, signal upgrades, bus stop enhancements, streetscapes, extended bike lanes, and pedestrian safety improvements. A complete streets project for SR 154/Campbellton Road will make various safety and multimodal improvements to that corridor and is currently in design phase. The complete streets project for SR 139/Martin Luther King Jr. Drive is currently under construction.

³ Fulton County, TSPLOST, <https://www.fultoncountyga.gov/inside-fulton-county/fulton-county-initiatives/tsplost>, accessed May 25, 2021.

⁴ Fulton County, TSPLOST Dashboard, <https://tsplost.fultoncountyga.gov/projects>, accessed May 25, 2021.

⁵ City of Atlanta, Renew Atlanta-TSPLOST, <https://www.renewatlantabond.com>, accessed May 25, 2021.

⁶ City of Atlanta, Renew Atlanta-TSPLOST, <https://www.renewatlantabond.com/projects>, accessed May 25, 2021.

2.5.3 Major Mobility Investment Program

The ongoing \$11 billion GDOT Major Mobility Investment Program (MMIP) is implementing capacity investments in Georgia's most heavily traveled transportation corridors. These include I-20 and I-285 within the Boulevard CID. The purpose of the MMIP is to expand capacity, enhance safety, and improve reliability on these corridors. Some MMIP projects were specifically designed to enhance freight mobility, such as commercial vehicle lanes on portions of I-75 and the expansion of I-16 to facilitate trucks serving the Port of Savannah. Others, while not solely designed to improve freight mobility, will benefit truck movements on key corridors. This includes ongoing projects on I-285 such as the I-285/ I-20 West Interchange and the I-285 Westside Express Lanes projects just outside the CID.

The I-285/I-20 West Interchange project calls for improvements of the interchange and the addition of lanes along I-20 in Cobb, Douglas, and Fulton counties.⁷ The purpose of the project, scheduled to be completed in 2026, is to improve traffic flow through the interchange. Specifically, the I-285/I-20 West Interchange project will:

- Reconstruct the interchange to remove left hand exits and modify and/or replace existing bridges and ramps;
- Construct an I-20 westbound collector-distributor (CD) system from the interchange to SR 70/Fulton Industrial Boulevard;
- Construct auxiliary lanes and improvements along 8 miles of I-20 in both directions from SR 6/Thornton Road to SR 280/Hamilton E. Holmes Drive;
- Modify and/or replace bridges along I-20;
- Add new lanes and improvements along two miles of I-285 southbound from SR 8/US 78/US 278/Donald L. Hollowell Parkway to SR 139/Martin Luther King Jr. Drive.

The I-285 Westside Express Lanes project will construct express lanes (one in each direction) on I-285 between Paces Ferry Road in Cobb County and SR 8/US 78/US 278/Donald L. Hollowell Parkway within the Boulevard CID.⁸ In addition, other improvements will be completed along with the I-285 Westside Express Lanes project including bridge widenings and replacements near Atlanta Road, South Cobb Drive, Bolton Road, and SR 8/Donald L. Hollowell Parkway. This project is currently in its preliminary engineering phase as GDOT has completed environmental field studies and traffic analyses. It is scheduled to be completed in 2032.

⁷ GDOT, Major Mobility Investment Program, I-285/I-20 West Interchange Project, <https://0013918-gdot.hub.arcgis.com/>, accessed May 24, 2021.

⁸ GDOT, Major Mobility Investment Program, I-285 Westside Express Lanes Project, <https://0013917-gdot.hub.arcgis.com/>, accessed May 24, 2021.

2.5.4 Regional Connected Vehicle Program

The Regional Connected Vehicle Program is a partnership between GDOT and ARC that expands the footprint of Metro Atlanta's connected roadway network.^{9,10} It involves installing roadside units (RSU) equipped with dedicated short-range communications (DSRC) and cellular communications, smart signals, and other technologies along major corridors to enable various mobility applications. These include:

- Emergency vehicle preemption – Preemption at select signals to improve emergency vehicle response time;
- Transit signal priority – Priority requests to signal controllers for specific transit applications and routes; and
- Freight signal priority – Signal priority for freight vehicles that are operating in cooperative platooning mode.

Through the Regional Connected Vehicle Program, the number of connected locations throughout Metro Atlanta will be expanded to up to 1,500. Within the Boulevard CID, portions of SR 6/Camp Creek Parkway, SR 70/Fulton Industrial Boulevard, and SR 8/US 78/US 278/Donald L. Hollowell Parkway are included in the program.

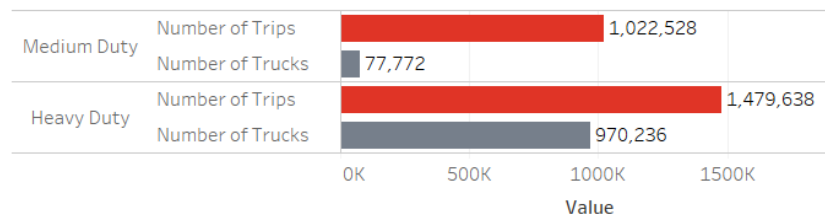
⁹ GDOT 2021 Statewide Strategic Transportation Plan: 2050 Statewide Transportation Plan.

¹⁰ Heath, A., "Achieving Safety Through Innovation and Technology," State Transportation Board Meeting, March 18, 2021, <http://www.dot.ga.gov/AboutGeorgia/Board/Board%20Meeting%20Documents/March%202021%20State%20Transportation%20Board%20Meeting.pdf>.

3 FREIGHT ANALYSIS

Understanding how freight moves to, from, and within the Boulevard CID is critical to assessing the transportation needs of businesses located in the CID. The INRIX Trip Path data was acquired for this study to describe the geographic and temporal patterns of truck trips involving the CID. This database reported the origins, destinations, routes, and travel times of truck trips originating, terminating, or passing through the Boulevard CID, during a 6-month period in 2019 (March, April, July, August, October, and November). These data also distinguish between the movements of medium-duty trucks (14,000 lb. Gross Vehicle Weight Rating) and heavy-duty trucks (more than 26,000 lb. Gross Vehicle Weight Rating). It represents an exceptionally powerful tool to describe trucking demand patterns throughout the region, at a level of detail not previously available, by connecting trip-level information with route-level detail. The acquisition of INRIX Trip Path data allowed the study to track how over 1 million trucks that operate in the Boulevard CID make over 2.5 million trips throughout the Atlanta region and beyond. Figure 1 shows a breakdown of these figures by truck type.

Figure 1: INRIX Data Set Totals



Source: Consultant analysis of INRIX Data

In the INRIX data, a stop is defined when vehicles do not move more than 656 feet in 10 minutes. In most cases, this represents the ultimate destination of the trip, when the truck makes a delivery or picks up a load. However, it is possible for the stop to represent refueling at a gas station or standing still during severe congestion, in which case the end of the trip does not represent the ultimate destination. Therefore, the INRIX data is better able to capture the ultimate destinations for shorter trips. In longer trips, it is more likely that trucks stop along the way, for a variety of reasons, and therefore the ultimate destinations are not fully captured. Even though the INRIX data is best suited for analyzing demand patterns for shorter trips, it was also able to pick up a significant number of trips throughout the Southeast, which describe the role that the Boulevard CID plays in the logistics of the region.

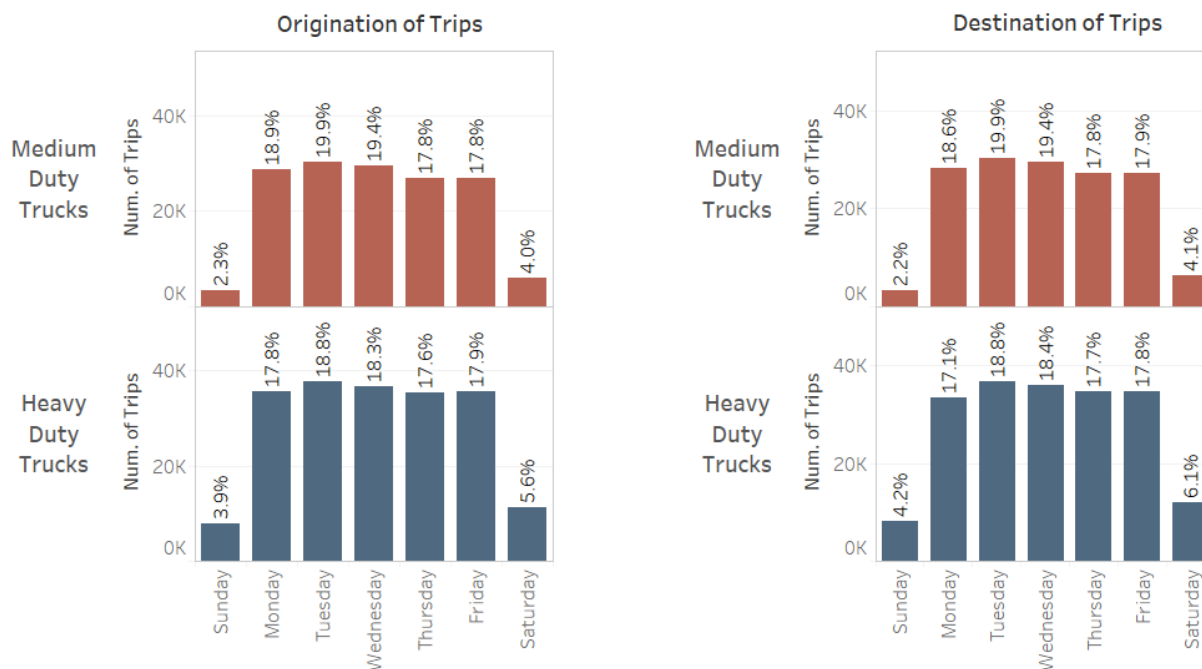
3.1 Freight Demand

3.1.1 Temporal Patterns

As expected, most truck activity in the Boulevard CID occurs during the week, with weekends seeing about a fourth to a fifth of the activity seen during the week. This can be seen in Figure 2, which shows the origination and termination of truck trips in the CID on different days of the week. This figure also shows how truck activity is fairly constant during weekdays, with Tuesdays and Wednesdays seeing slightly more activity than other weekdays. This pattern is similar for medium duty trucks and heavy-duty trucks. During

the weekends, there is proportionately more activity of heavy-duty trucks than medium-duty trucks. These day-of-week temporal patterns are consistent with the patterns observed in other industrial areas around the country.

Figure 2: Trucking Activity by Day of Week

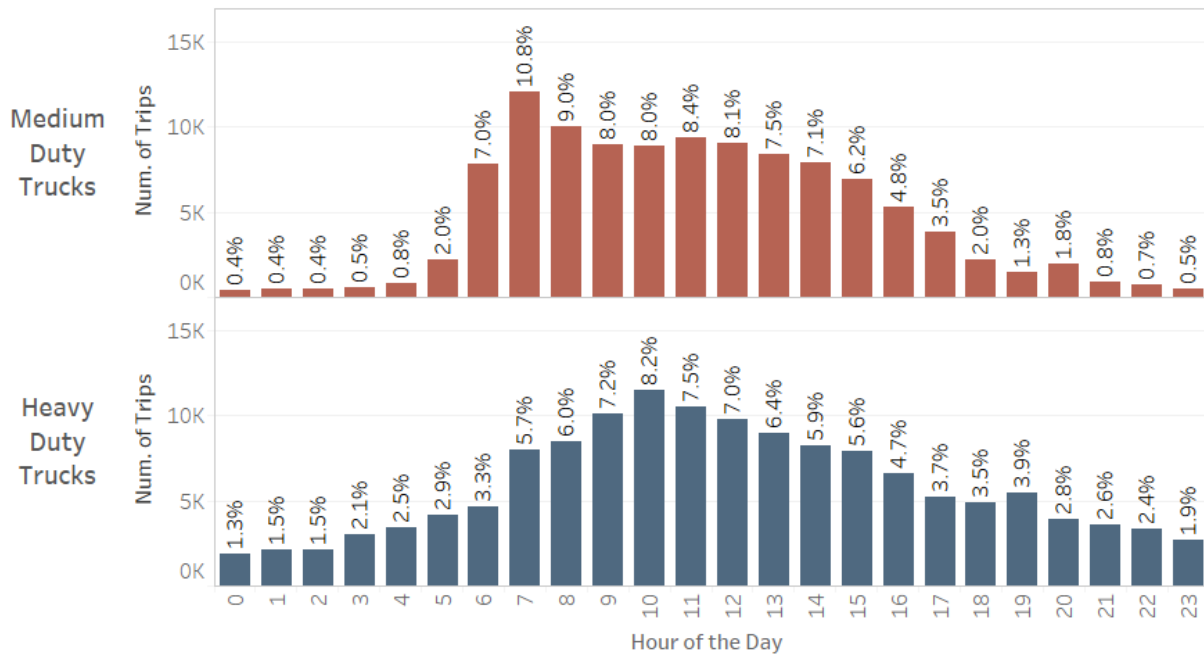


Source: Consultant analysis of INRIX Data

Medium-duty trucks and heavy-duty trucks start and end trips at different times of the day, with medium-duty truck trips starting earlier. Approximately 27 percent of all medium-duty truck trips start between 6am to 9am, while during this period only 15 percent of heavy-duty truck trips start, as can be seen in Figure 3. This is due to medium-duty trucks leaving the Boulevard CID early to begin their delivery tours. Medium-duty truck trips remain high throughout the day, until 2pm, at which time they drop off rapidly. The early afternoon, between 1 to 3pm, is likely the time when medium-duty trucks start their second shift. Heavy-duty trucks have a different time-of-day pattern. Peak trip generation occurs later, between 9 am to 12 pm, and trails-off later in the day until peaking again at 7pm. Heavy-duty trucks are observed to originate more trips at night than medium-duty trucks.

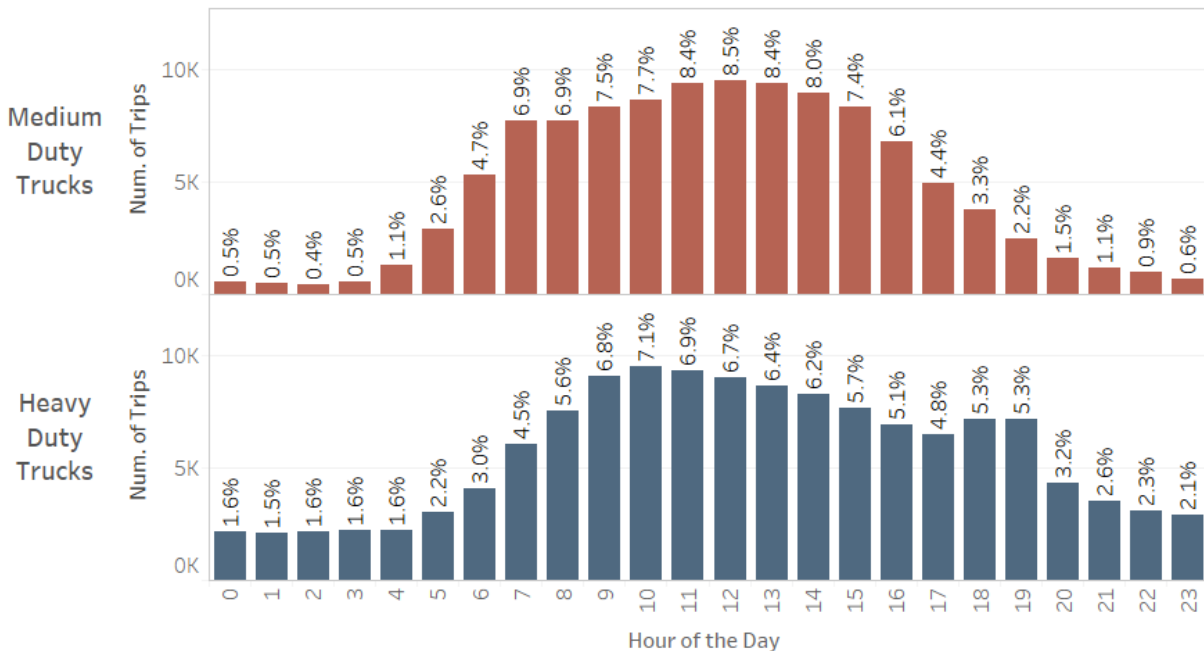
Trip arrivals observe a different pattern than trip generation. As can be seen in Figure 4, medium-duty trucks arrive at a consistent rate between 9am and 5pm, likely representing a mix of trucks making deliveries to industrial facilities in the Boulevard CID, and trucks returning from making deliveries throughout the metro Atlanta region. Heavy-duty trucks observe a similar pattern, however there is a pronounced peak observed at 7pm. This is likely driven by the operating procedure of one or several large freight generators in the Boulevard CID. As with originations, heavy-duty trucks are more apt to arrive at night than the medium-duty vehicles.

Figure 3: Hourly Origins of Truck Trips



Source: Consultant analysis of INRIX Data

Figure 4: Hourly Destination of Truck Trips



Source: Consultant analysis of INRIX Data

The 2016 Atlanta Regional Freight Mobility Plan Update prepared by the Atlanta Regional Commission (ARC) identified seven freight-intensive clusters in the region that are responsible for the bulk of the freight activity in metro Atlanta. These clusters, shown in Figure 5, have a high density of manufacturing and warehousing facilities, resulting in a concentration of truck trip originations and terminations. The Boulevard CID is part of the Fulton freight cluster, which was defined to include some of the surrounding industrial activity.

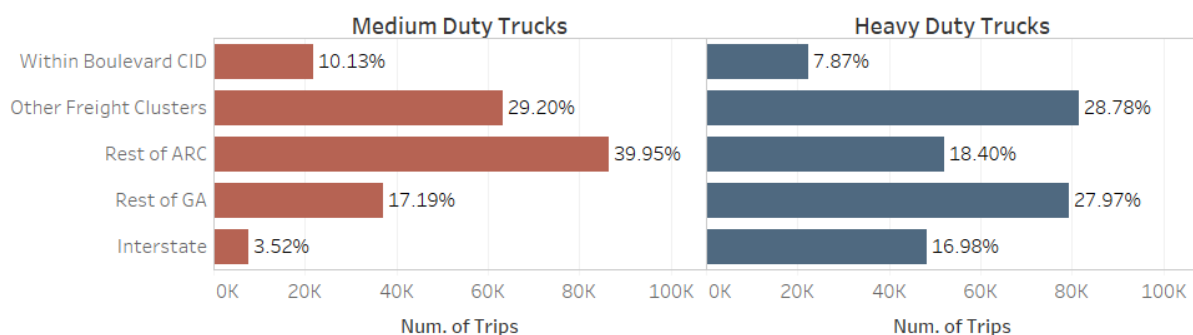
[illegible]

Source: ARC Atlanta Regional Freight Mobility Plan Update, 2016

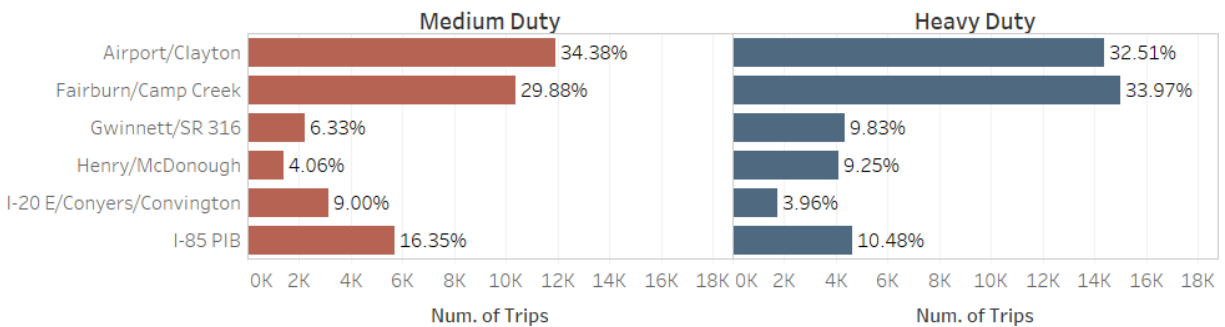
The INRIX data was used to understand the spatial patterns of truck trips traveling within the Boulevard CID, between the CID and other freight clusters, between the CID and elsewhere in the ARC region, or traveling beyond. As can be seen in Figure 6, approximately 10.1 percent of medium-duty truck trips and 7.9 percent of heavy-duty truck trips involving the CID start and end within the CID (only trips longer than 2 miles were considered to avoid counting repositioning of trucks within facilities). This likely includes a mix of deliveries between facilities clustered nearby and trips where trucks park temporarily, for staging reasons, before picking up a load (see Section 3.4 for a discussion of this type of parking). The direction of travel, to or from the Boulevard CID, was not found to be a significant factor in the shares reported, therefore Figure 6 combined both directions of travel.

Figure 6 also shows how a significant share of truck trips involving the Boulevard CID (excluding trucks passing through) go to or come from the other 6 freight clusters in the region. This accounts for 29.2 percent of medium-duty truck trips and 28.8 percent of heavy-duty truck trips. These trips represent business-to-business deliveries in support of local economic activity. Figure 7 shows which freight clusters these trips went to or came from. The Airport/Clayton and Fairburn/Camp Creek clusters accounted for approximately two-thirds of the trips involving the Boulevard CID. This result is expected, given that both of these clusters are the closest to the CID (see Section 3.3.2 for a discussion of travel times between clusters), and include a myriad of manufacturing and warehousing activity that likely located in that region for proximity to clients or suppliers. The Fairburn/Camp Creek cluster also is home to the CSX Fairburn intermodal terminal (the NS terminals lie in the “Rest of ARC”, and the CSX Hulsey terminal has been repurposed), while the Airport/Clayton cluster contains the Hartsfield-Jackson Atlanta International Airport. This is the primary air cargo airport of the Southeast U.S., serving as an important international gateway in the region. The INRIX data also shows that the Fairburn/Camp Creek cluster and Airport/Clayton cluster attract a similar share of medium-duty trucks and heavy-duty trucks, while the Fairburn/Camp Creek cluster attracts a slightly higher share of heavy-duty trucks. A significant number of truck trips were also observed between the Boulevard CID and the remaining 4 clusters, with the I-85 Peachtree Industrial Boulevard (PIB) cluster ranking the highest.

Figure 6: Geographical Patterns of Truck Trips Involving FIB

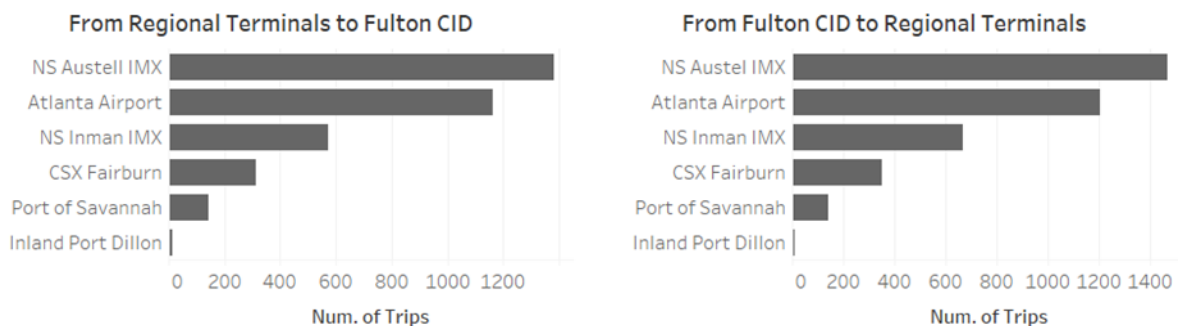


Source: Consultant analysis of INRIX Data

Figure 7: Geographical Patterns of Truck Trips Involving FIB and other Freight Clusters

Source: Consultant analysis of INRIX Data

Figure 8 shows how the Boulevard CID is connected to the key intermodal infrastructure in the region. The main intermodal hub for shipments involving the Boulevard CID is the Norfolk Southern (NS) Austell Intermodal Terminal. Note that the INRIX data represents a sample of all truck trips, therefore the values shown in Figure 8 account for a fraction of the activity at these facilities. However, this data does point to the Austell Intermodal Terminal being important for businesses in the CID. The second highest on this figure is the Hartsfield-Jackson Atlanta International Airport, followed by the NS Inman Intermodal Terminal. It is likely that the number of trips to and from the Port of Savannah and the Dillon Inland Port in Dillon, South Carolina are underestimated because of the likelihood of making intermediate stops on these longer trips.¹¹

Figure 8: Trips to and from Regional Terminals

Source: Consultant analysis of INRIX Data

3.2 Route Analysis

An analysis was conducted to develop an understanding of the main routes used by trucks traveling within, and to/from the Boulevard CID. This information will be helpful to prioritize projects that generate the most benefits to trucking operations. As expected, the road in the Boulevard CID that carries the highest truck

¹¹ Although the Port of Brunswick in Brunswick, Georgia is often a significant trading partner for freight clusters, there was only one trip between the Port of Brunswick and the Boulevard CID during the period of analysis. This is most likely due to Brunswick's predominance as an auto import site, and the Boulevard CID does not have auto-related industries within its boundaries.

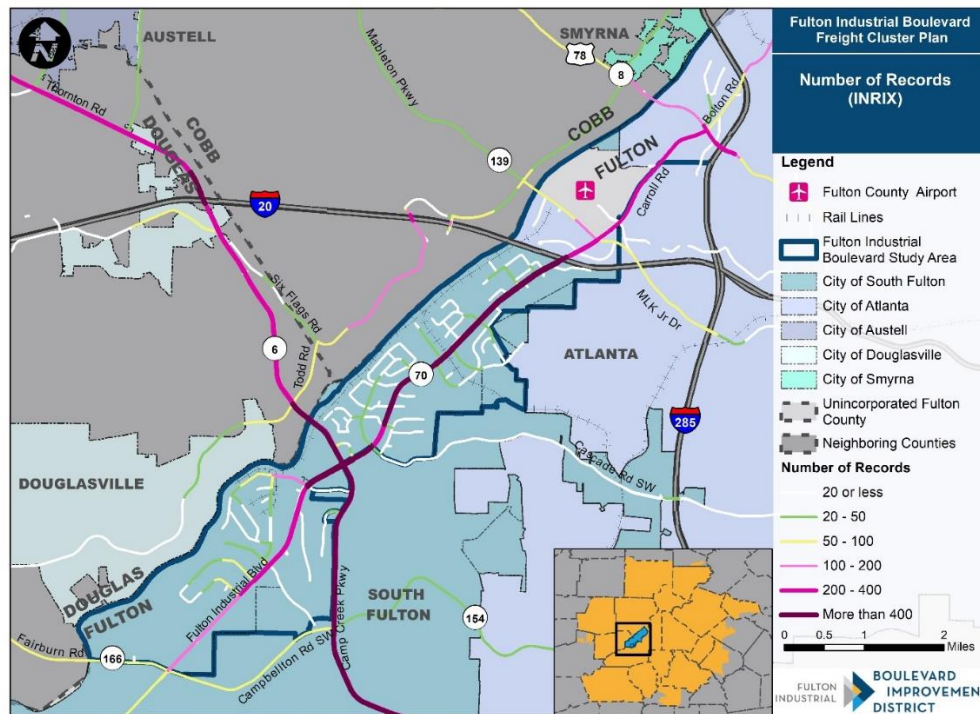
volumes according to the INRIX data is Fulton Industrial Boulevard. As shown in Figure 9, volumes are the highest occur on the intersection with Camp Creek Parkway, and on the segment bounded by I-20 on the north and Selig Drive. Volumes are also high throughout Camp Creek Parkway, which is a major freight thoroughfare in the region. It is important to remember that the INRIX data represents a sample of the whole truck population, and as such provides an estimation of relative volumes on roads. Elsewhere, this study presents data from the Georgia Department of Transportation that estimates vehicle volumes on the roads. This study also collected counts on key roads in the CID for conducting traffic analysis. However, this data only covers the main roads, and misses most of the roads in the Boulevard CID. Even if estimated, these statewide estimates are generally not as accurate for lower classification roads than they are for interstates and major roads. Therefore, the INRIX data fill that gap in describing the relative volumes and trucking activity on some of the secondary roads in the CID, which are still critical to the businesses that rely on them for their daily operations.

From Table 9, it can be seen that the following cross-streets show significant activity in the INRIX data:

- Westgate Parkway
- Great Southwest Parkway
- Phillip Lee Drive
- Wharton Drive
- Patton Drive
- Martin Luther King Jr. Drive
- Donald L. Hollowell Parkway

Most of these cross streets are unsignalized, which could cause operational issues during peak hours of the day. A traffic analysis will be presented in a forthcoming memo (Task 5 of this study), describing how the roadway infrastructure is accommodating trucks.

Figure 9: Map of Truck Volumes in the Boulevard CID



Source: Consultant analysis of INRIX Data

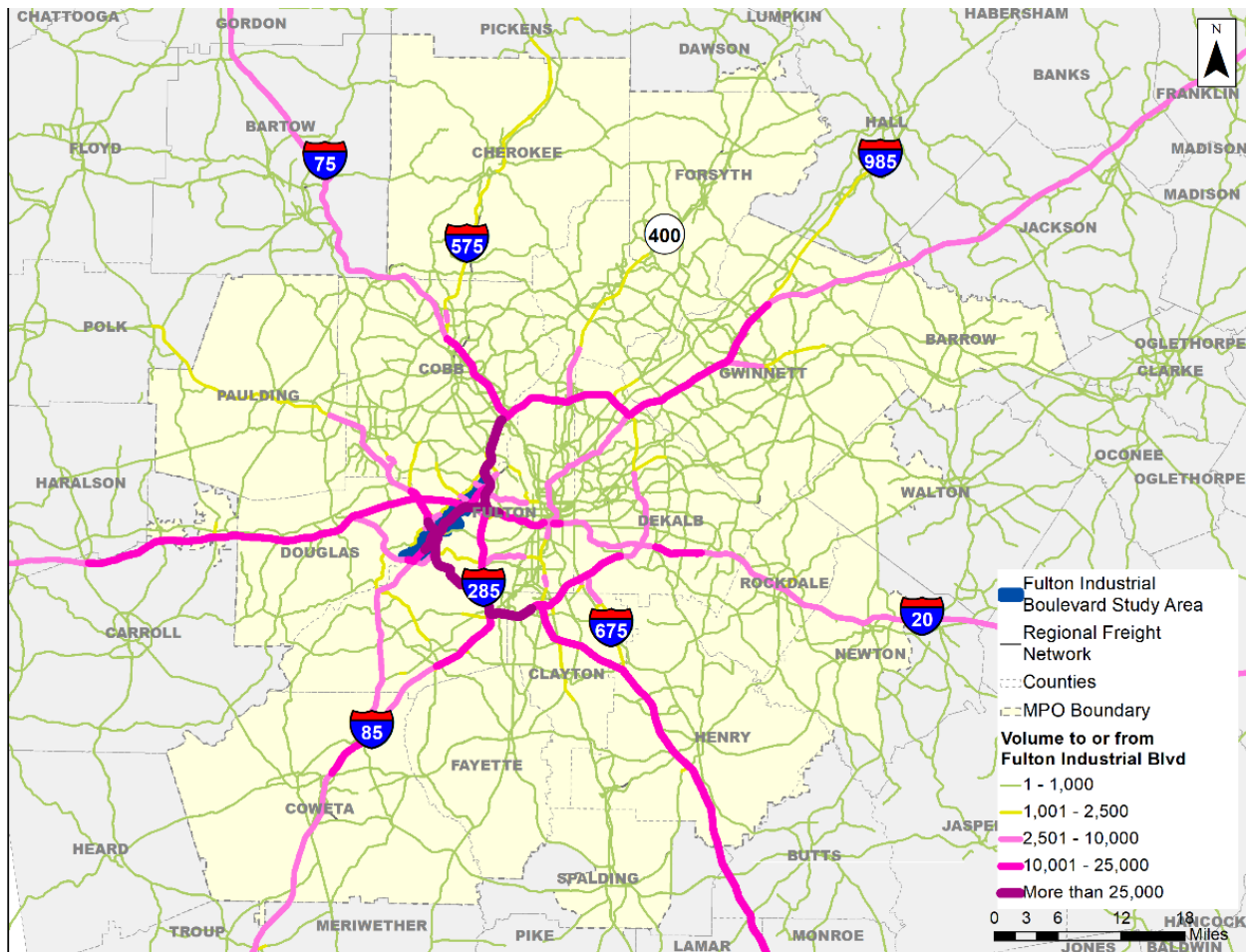
Figure 10 shows the roads used by truck trips that have origins or destinations in the Boulevard CID. This map only shows activity for truck trips on the routes that are important for the connectivity of the CID to the rest of the Atlanta region. Two routes show up prominently in this analysis (dark purple):

- North route: Trucks using the Donald Lee Hollowell Parkway to get on (off) I-285 heading (coming) north to I-75 and beyond.
- South route: Trucks using Camp Creek Parkway to get on (off) I-285 and connect to I-75 south

The important arterials used to access Boulevard CID include:

- Camp Creek Parkway
- Donald Lee Hollowell Parkway
- Thornton Rd
- Fairburn Rd
- Arthur B. Langford Jr. Parkway
- Cascade Palmetto Highway

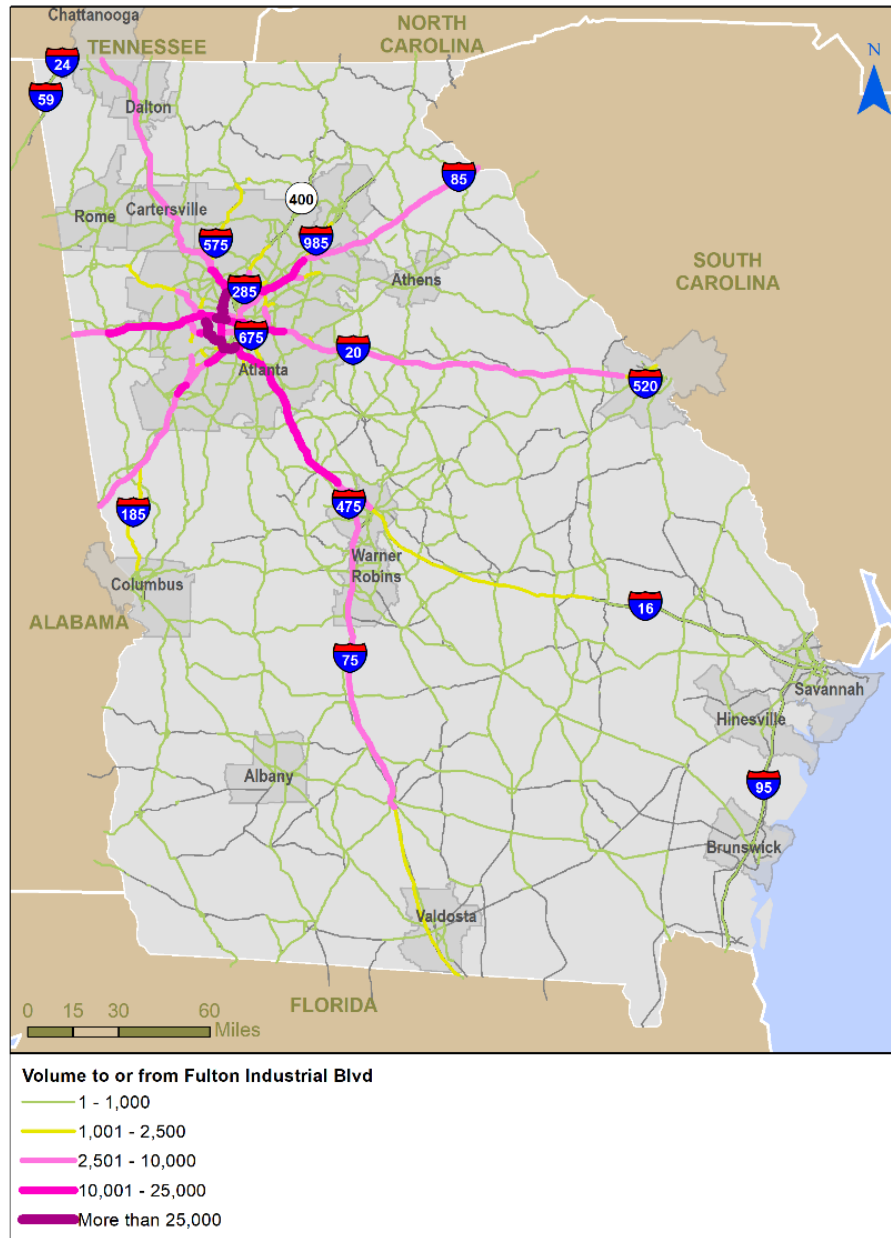
Figure 10: Map of Truck Volumes heading to or from Boulevard CID



Source: Consultant analysis of INRIX Data

Figure 11 shows the same data shown in Figure 10, but zoomed out for the state of Georgia. This shows the regional routes used by trucks that start or arrive in the Boulevard CID. Outside of the metro Atlanta region (covered above), the interstate segment used most by CID trucks is the portion of I-75 south of Atlanta. Other regional interstates, such as I-75 north of Atlanta, I-85 north and south of Atlanta, I-20 east and west of Atlanta, all have similar usage by CID trucks, reflecting the diversity of industrial activity that takes place at the CID.

Figure 11: Statewide Freight Volumes to and from Fulton Industrial Boulevard



Source: Consultant analysis of INRIX Data

3.3 Congestion Analysis

3.3.1 Recurring and Non-Recurring Congestion

An analysis was conducted to better understand congestion patterns in the Boulevard CID. This analysis followed the methodology developed by NCHRP Report 925 - *Estimating the Value of Truck Travel Time*

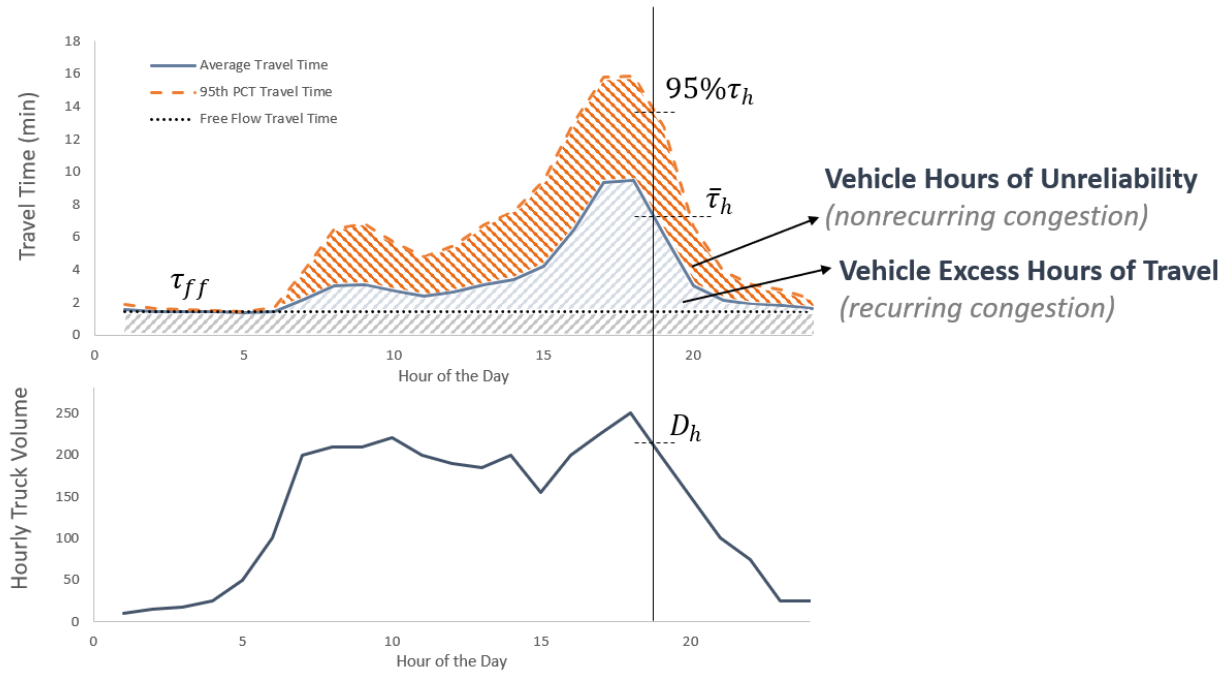
*Reliability*¹², which focuses on distinguishing recurring congestion from non-recurring congestion to interpret congestion from an economic perspective. Making this distinction is important because research shows that freight users are much more concerned about non-recurring congestion. Motor carriers can schedule deliveries that account for slower speeds if traveling during congested times of the day; however, non-recurring congestion is difficult to anticipate, and can cause significant unreliability not only to the motor carrier, but also to their customers (shippers and receivers). A late shipment can disrupt production, cause a stock-out at a store, or lead to a missed intermodal transfer at an airport, seaport, or rail terminal. On-time performance, which is one of the most important factors in modern-day supply chains, becomes much more difficult to achieve with high levels of non-recurring congestion.

Figure 12 visualizes how recurring and non-recurring congestion were quantified in the Boulevard CID. This included:

- **Recurring congestion** (blue shaded area in figure) was quantified as the number of hours of travel above free flow conditions, which was defined as the Vehicle Excess Hours of Travel (VEHT). VEHT was estimated by comparing average travel times to the free flow travel time for every hour of a typical weekday, and summing throughout the day while multiplying by the number of trucks traveling through that road each hour. While NCHRP Report 925 recommends estimating hourly vehicle volumes, counts from the INRIX data were used instead, which represent a sample of all truck activity. This leads the VEHT estimated to represent a sample of the true VEHT, and therefore useful primarily to evaluate relative congestion on roads. The VEHT metric was divided by the centerline length of the segment to compare between segments of different lengths.
- **Non-recurring congestion** (orange shaded area in figure) was quantified as the number of Vehicle Hours of Unreliability (VHU) accumulated in each segment, which was calculated as the difference between the 95th percentile travel time and the average travel time. This measure sums the hours of uncertainty that trucks face while traveling throughout the day. This is a superior way of measuring unreliability than the often-used travel time indices or buffer indices, because it is additive and focuses on non-recurring congestion, while the other metrics don't distinguish clearly between recurring and non-recurring congestion, making it hard to interpret.

¹² Guerrero, S. E., et al. (2019) Estimating the Value of Truck Travel Time Reliability, National Cooperative Highway Research Program Report 925, Transportation Research Board.

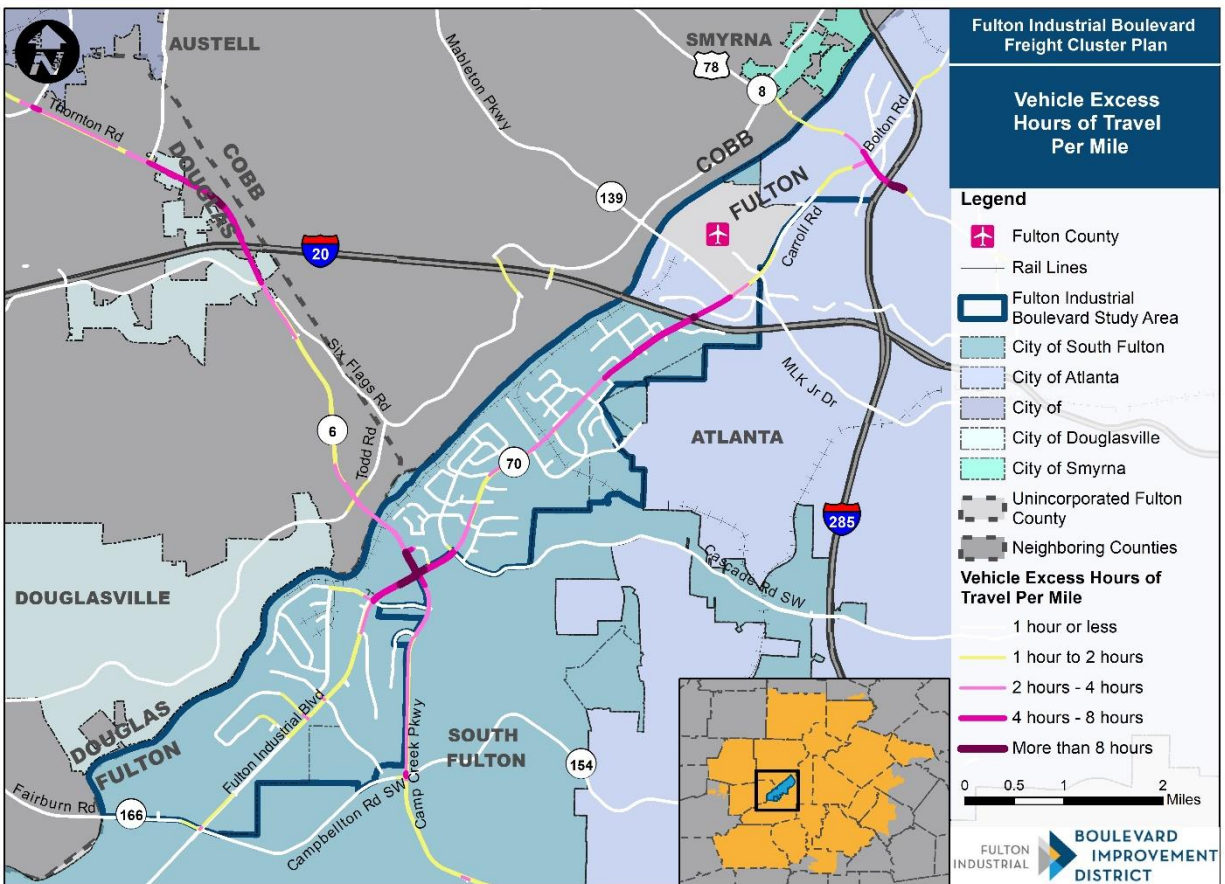
Figure 12. Example Calculation of Congestion Metrics



Source: Consultant analysis of INRIX Data

The location in the CID that generates the most recurring congestion delays for trucks is the Fulton Industrial Boulevard at Camp Creek Parkway intersection. Recurring congestion is also observed on the approach to the I-20 interchange on Fulton Industrial Boulevard. Outside of the CID boundaries, there is significant congestion on Thornton Road at the interchange with I-20, and on Donald L. Hollowell Parkway at the I-285 interchange. This second location is likely resulting from the nearby truck parking facility (largest in the Atlanta region), which drive high truck volumes and congestion on this road. While outside of the CID boundary, these congested locations impact the access of trucks to and from the CID.

Figure 13: Map of Vehicle Excess Hours of Travel Per Mile in Boulevard CID

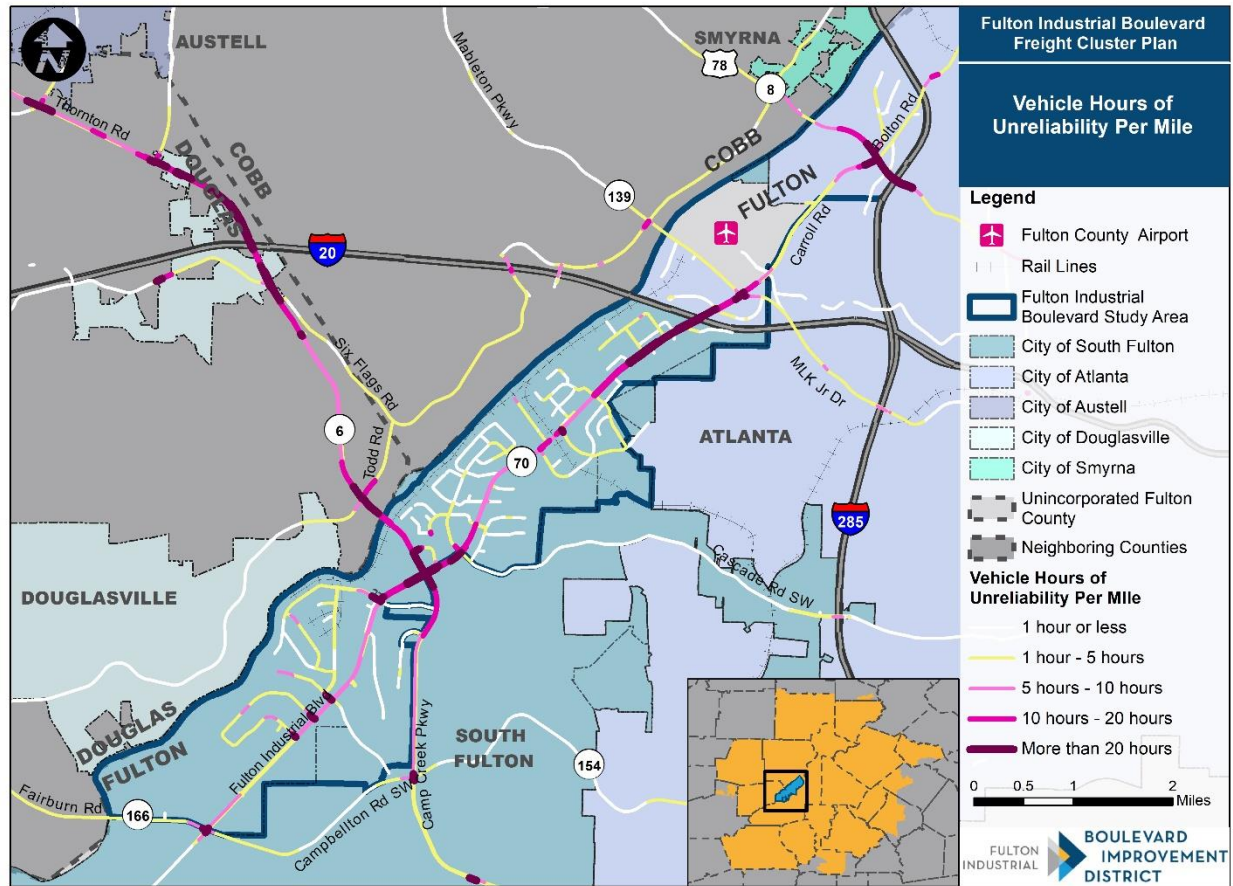


Source: Consultant analysis of INRIX Data

Non-recurring congestion patterns are shown in Figure 14. Hotspots of non-recurring congestion occur at the places where there are intersections between major roads or on/off ramps from highways. Unreliability at major intersections (such as Fulton Industrial Boulevard and Camp Creek Parkway) occurs because some trucks will be able to navigate the intersection without delay if they reach it during a green phase, while others might get stopped in lengthy queues if reaching it during a red phase. During congested times of the day these queues are larger, taking longer to evacuate, and leading to the accumulation of unreliability. Major intersections just outside the study boundaries (such as Donald Lee Hollowell Parkway and Fulton Industrial Boulevard) also generate significant unreliability for trucks heading to and from the Boulevard CID.

Access to and from major highways, particularly I-20, also accumulates unreliability not just because there are traffic signals at these locations, but because congestion spills over from the highway. Data shows this occurs on the on/off ramps accessing I-20 from Fulton Industrial Boulevard. Congestion on the interstates surrounding the Boulevard CID is a significant issue. The I-20 at I-285 interchange was recently ranked as the 4th worst bottleneck in the country by the American Transportation Research Institute, although it is being currently addressed by an on-going project.

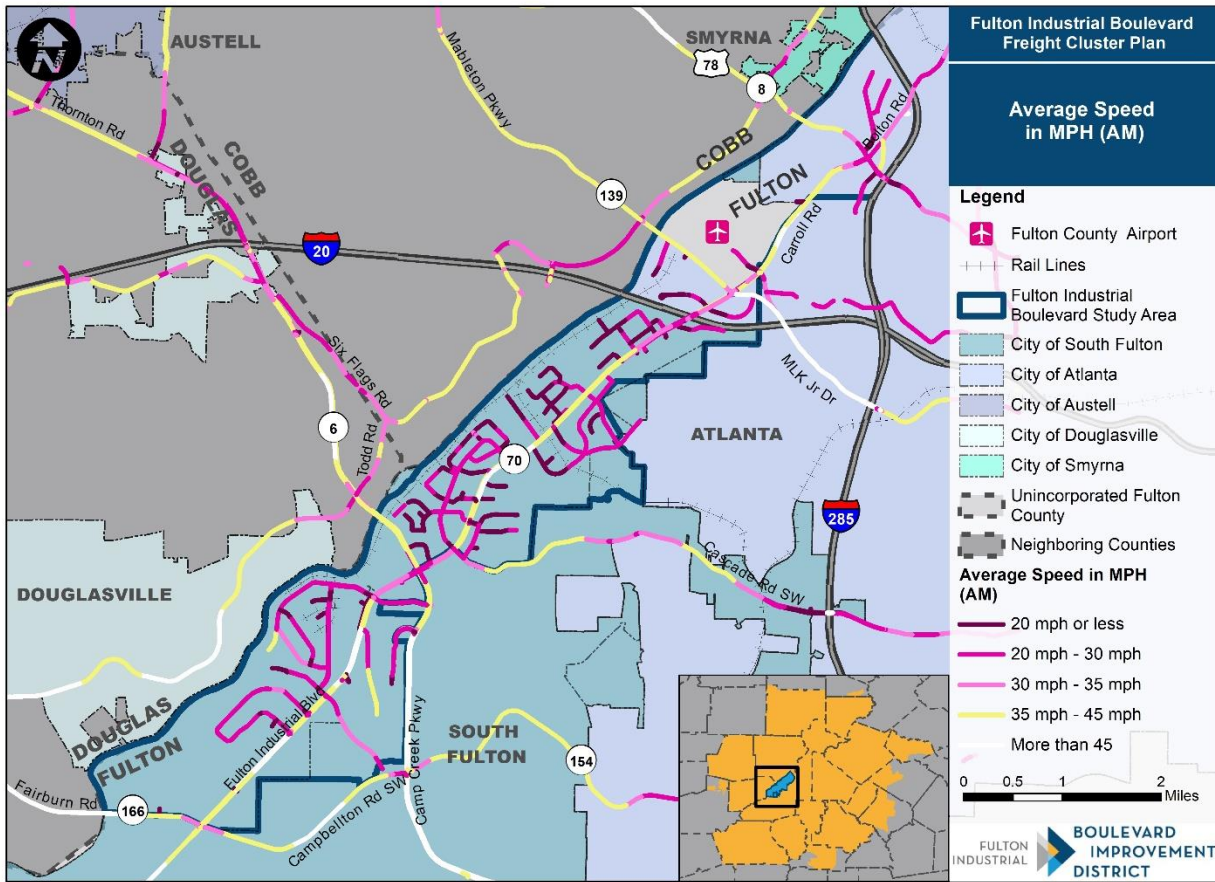
Figure 14: Map of Vehicle Hours of Unreliability Per Mile in Boulevard CID



Source: Consultant analysis of INRIX Data

Figure 15 illustrates the average weekday speeds during the morning peak period. As expected, speeds are the lowest on lower functional classification roads, and remain high on most portions of Fulton Industrial Boulevard, except for the congested locations mentioned previously. As shown in Section 3.1.1, the origination and termination of truck trips peaks during the morning.

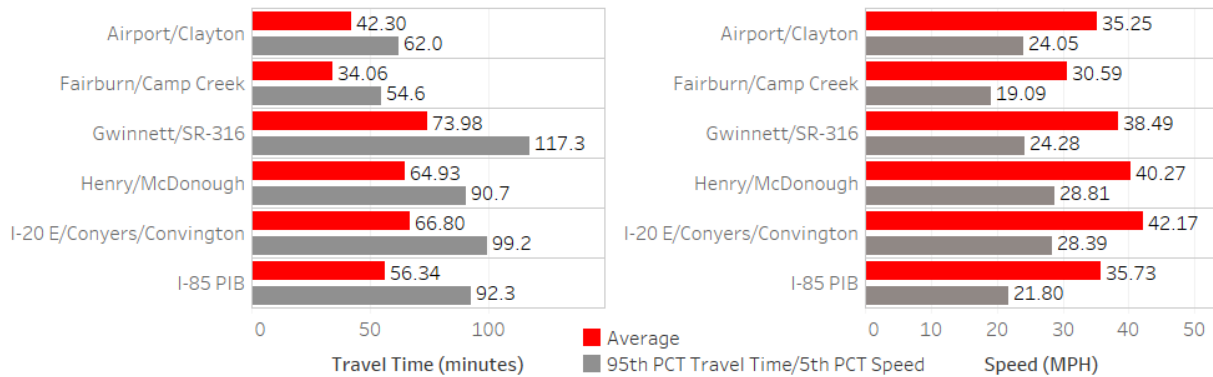
Figure 15: Map of Average Speeds During the AM Period in Boulevard CID



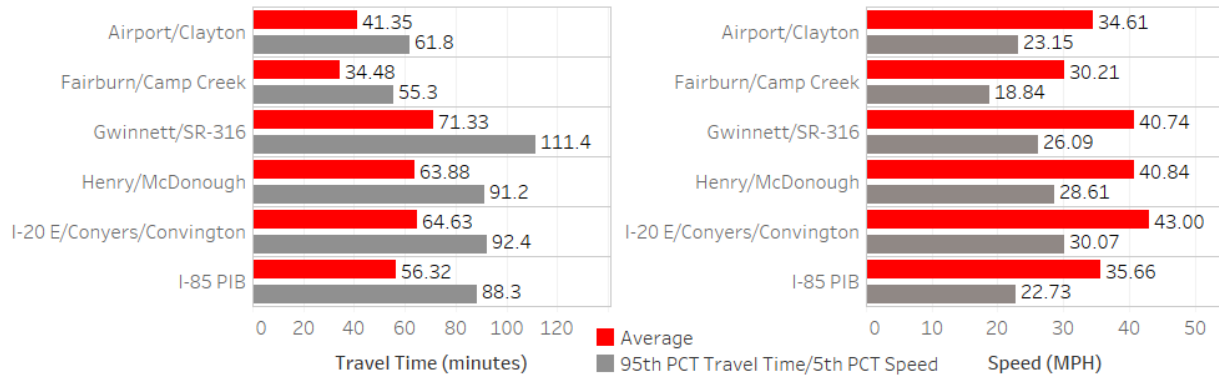
Source: Consultant analysis of INRIX Data

3.3.2 Regional Connectivity

An analysis was conducted to track the travel times and speeds of trucks traveling between the Boulevard CID and other freight clusters in the region. Figure 16 shows the results for trips heading to the CID. The freight clusters that are closest to the CID—Fairburn/Camp Creek and Airport/Clayton—also have the shortest travel times, unsurprisingly. On average, it takes 34 minutes to travel from Fairburn/Camp Creek and 43 minutes to travel from Airport/Clayton. However, because of congestion, these travel times can increase significantly to 55 minutes and 62 minutes respectively. These values represent the travel times of the slowest trip out of every 20 trips (95th percentile travel times and 5th percentile speeds). During congested periods of the day, shippers and motor carriers build a buffer into their delivery schedule, above what the trip would take during normal conditions, because speeds are slower and there is greater uncertainty in arrival times. Another finding from Figure 16 is that three of the freight clusters are on average 1 hour away from the Boulevard CID: I-20 E/Conyers/Covington, Henry McDonough, and Gwinnett/SR-316. During congested times of these, these travel times can increase to an hour and a half to almost 2 hours. A similar pattern is observed in Figure 17 for trucks traveling from the Boulevard CID to other freight clusters in the region.

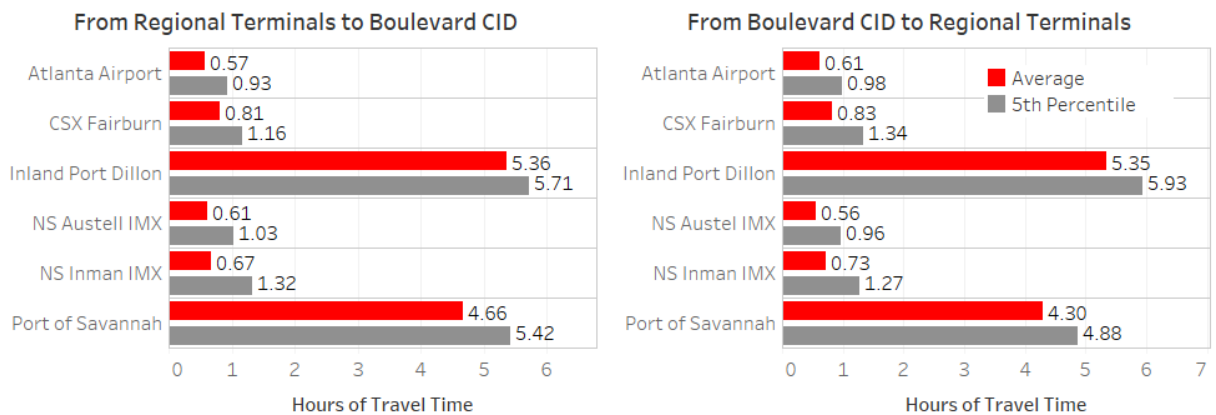
Figure 16: Travel Times and Speeds of Trips from Freight Clusters to Boulevard CID

Source: Consultant analysis of INRIX Data

Figure 17: Travel Times and Speeds of Trips from Boulevard CID to Freight Clusters

Source: Consultant analysis of INRIX Data

Figure 18 shows the travel times between the Boulevard CID and nearby intermodal terminals. Surrounding the CID, in the Atlanta region, there are several rail intermodal terminals within a 30 to 40 minute drive. This includes the CSX Fairburn, NS Austell, and NS Inman intermodal terminals. As mentioned previously, this data also shows the speediness of accessing the Hartsfield-Jackson Atlanta International Airport from the CID, although during congested periods this trip could take upwards of 50 minutes. To reach the main seaport in Georgia, the Port of Savannah, it takes trucks 4.3 hours traveling from the CID, and 4.7 hours traveling from the port to the CID. During congested times of the day it could take trucks an additional 30 to 40 minutes to complete this journey.

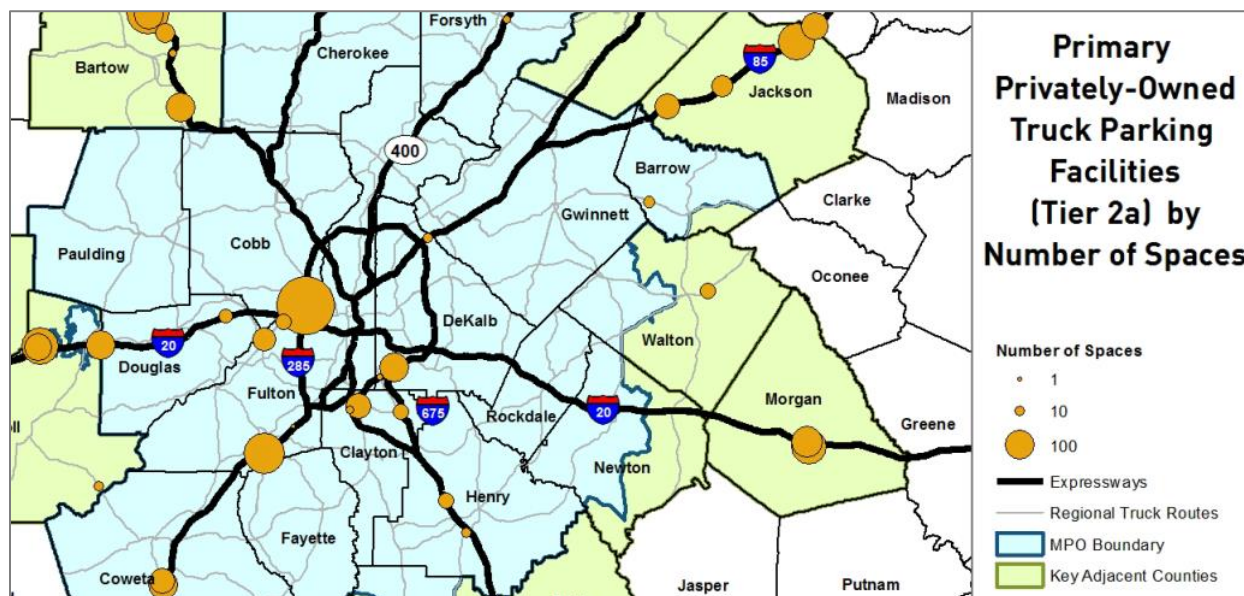
Figure 18: Travel Times Between Boulevard CID and Nearby Intermodal Terminals

Source: Consultant analysis of INRIX Data

3.4 Truck Parking

The inability to find parking has become one of the top issues for truck drivers nationwide. Lack of parking availability at parking facilities or commercial and industrial facilities, particularly in and around urban areas, often forces drivers to spend a considerable amount of time searching for a space, which translates directly into lost productivity and higher trucking costs. It is not uncommon for drivers to run out of regulated hours of service (or just “hours”) trying to find parking, forcing them to park in undesignated locations on roadway shoulders, ramps, or public lots.

The 2018 ARC Regional Truck Parking Assessment found that locating parking in the greater Atlanta region is a challenge, with demand outstripping available capacity. A survey conducted of trucking sector participants found that 73 percent saw truck parking as a significant issue. This study, however, found that the interstate corridors surrounding the Boulevard CID (I-20 and I-285 west) have the most availability of parking spaces relative to demand in the region, making finding a space in this area easier than elsewhere (especially on I-85 or I-75). As can be seen in Figure 19, there are several private parking facilities on I-20 and I-285, surrounding the Boulevard CID. This includes the Petro Georgia Atlanta parking facility, which is the largest in the Atlanta region, and is located just northeast of the CID. Within the CID there are several parking facilities, including a Quick Trip station located at the intersection of Camp Creek Parkway and Fulton Industrial Boulevard. In addition to the private facilities shown in Figure 19, there is also a small public facility on I-20, northwest of the CID.

Figure 19: Private Truck Parking Facilities

Source: ARC Regional Truck Parking Assessment, 2018

While the ARC Regional Truck Parking Assessment found that truck parking was generally available on corridors surrounding the Boulevard CID, it is possible that availability has diminished since the publication of this study, especially with the recent surge in e-commerce. Even though the area surrounding the Boulevard CID has more parking capacity compared to other areas in Atlanta, demand could be relatively high because of the density of manufacturing and warehouse activity, and proximity to intermodal infrastructure, including the airport.

Most truck parking issues in the Boulevard CID likely relate to staging, which stems from the need of truck drivers to meet specific delivery and pickup windows. Industrial and commercial facilities receiving freight typically have a fixed number of docks and dock workers, and a limited area for trucks to park (because land is expensive), therefore they schedule deliveries within certain windows, typically 1 to 3 hours long, but often as little as 15 minutes. The receiver's operations and production counts on the delivery arriving during this time—especially in just-in-time supply chains that carry minimal inventories—placing a high premium on the shipment arriving on time. Walmart's new "on-time, in-full" program requires suppliers (and the truck lines they hire) to meet distribution center delivery windows 98% of the time, or face fines equivalent to 3% of the value of goods. Such penalties are not uncommon throughout the industry.

Delivery windows, which have become ubiquitous in modern supply-chains, place pressures on truck drivers that increase urban parking demand. The emphasis on meeting the delivery window leads truck drivers to have a strong incentive to plan to arrive early in case of congestion or unforeseen circumstances. In some instances, trucks might be allowed to enter the receiver facility early, but this is not typical, especially for establishments that generate or attract significant quantities of freight, such as distribution centers. These establishments are generally built with only the truck parking capacity to accommodate the throughput of shipments. Even when the capacity exists to park on-site, managers often discourage this for

liability and operational reasons (e.g., not having adequate facilities to accommodate third-party personnel). If there are no truck stops or rest areas or on-street parking nearby, trucks are forced to park in undesignated locations waiting for their appointment, often queuing outside of the establishment. While there are parking facilities in and around the Boulevard CID, these could become full, especially early morning, leading drivers to resort to parking in undesignated locations instead. Some drivers also do not prefer to park at these large facilities because they can be crowded, difficult to navigate, and not as convenient as parking right outside their destination.

However, undesignated parking, either outside of establishments or along major truck routes, can pose a safety risk to other vehicles, create litter or other nuisances, and is typically illegal. For example, Boggs et al. (2019)¹³ found that undesignated parking at the entry or exit ramps of parking facilities leads to increases in crashes. Approximately 1/3 of the collisions on interchange ramps were at ramps adjacent to parking facilities with utilization of 90% or greater. The lack of designated parking can also cause safety issues on the road. Difficulty in finding places to rest, combined with increased pressures to maximize revenues, can lead truck drivers to undertake risky behavior by driving while fatigued (Thompson et al. 2015)¹⁴, creating a safety risk even when the trucks are on the road.

Ensuring that adequate parking capacity is available for trucks would not only improve safety and facilitate adherence to Hours of Service regulations, but it would enhance productivity as well. Drive time is a fixed asset; the time spent looking for parking represents time that the driver is not spending moving cargo or resting. This reduces the speed and efficiency of truck transportation, thereby increasing the logistics costs of all products that rely on trucking.

3.4.1 Undesignated Parking Analysis

An analysis was conducted to identify locations in the Boulevard CID that see frequent undesignated parking. As mentioned previously, these locations could cause safety risks and deteriorate the operations of the roadway, particularly if travel lanes are being blocked. The ARC Regional Truck Parking Assessment did not identify any major undesignated truck parking locations in the Boulevard CID. However, anecdotally it is known that significant undesignated parking occurs dispersed throughout the CID, primarily for the staging reasons mentioned above. An analysis was conducted using the INRIX trip data to identify hotspots of undesignated truck parking activity.

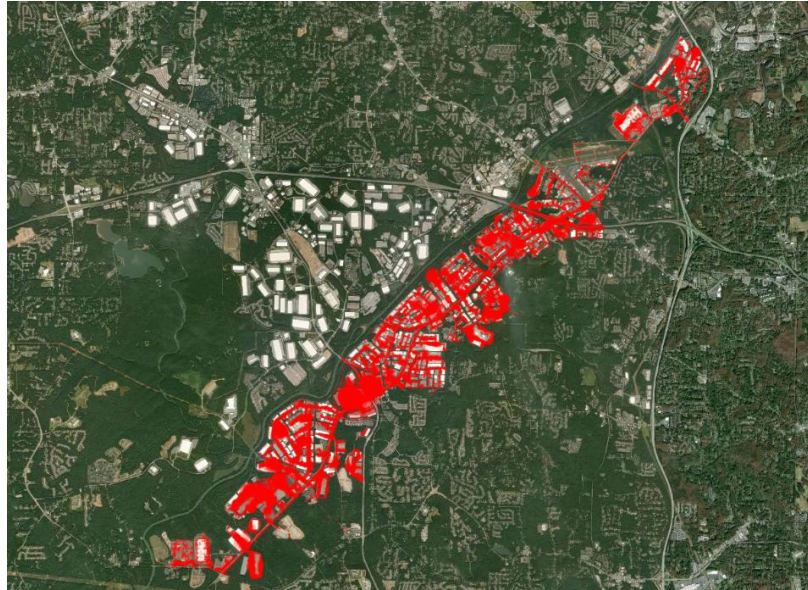
The locations where trucks are stopping in the Boulevard CID are shown in Figure 20 (termination of INRIX truck trips in the region). Most of the stops occurred at manufacturing or warehousing facilities, as expected. However, a scan was conducted to identify locations that are seeing frequent truck parking in places where they should not be parking. Some of this parking activity was found on wide driveways leading up to industrial facilities, causing minimal disruptions to other traffic or the accessibility of other facilities. However,

¹³ Boggs, A., Hezaveh, A.M., Cherry, C.R. 2019. Shortage of commercial vehicle parking and truck-related interstate ramp crashes in Tennessee. In: 98th Annual Meeting of the Transportation Research Board. Washington DC.

¹⁴ Thompson, J., Newnam, S., Stevenson, M. 2015. A model for exploring the relationship between payment structures, fatigue, crash risk, and regulatory response in a heavy-vehicle transport system. *Transportation Research Part A*, 82, 204–215.

some undesignated parking was found on narrow travel lanes on roads that provide access to multiple industrial facilities. Trucks parked at these locations are likely creating a significant disruption to traffic, causing them to swerve onto oncoming travel lanes, creating a safety risk. Outside of the main roadways (e.g. Fulton Industrial Boulevard, Camp Creek Parkway), most roads in the CID did not have shoulders that could accommodate trucks. This forced trucks to park on travel lanes. Some of these lanes are wide enough to accommodate multiple trucks, but most are not.

Figure 20: Analysis of Truck GPS Data to Identify Undesignated Truck Parking Hotspots



Source: Consultant analysis of INRIX Data

In addition to the scan of the INRIX data, undesignated parking locations were also identified through field observation. On April 30, 2021, a field study was conducted that included noting locations of undesignated truck parking.

Table 1 shows the undesignated parking locations identified. These locations had at least 1 truck parked, observed through either satellite imagery or the field study; often multiple trucks were observed parked at the same time. Locations identified through GPS data had multiple truck stops during the GPS data period. Most of the undesignated parking locations were not found to pose a clear safety issue to the truck or other vehicles, however seven were assessed to pose these types of issues. Parking in-lane that did not pose a clear safety issue likely involved lanes that were wide enough to accommodate multiple trucks. Parking on grass or gravel lots was uncommon, with only 2 locations identified in the CID. Figure 21 maps the undesignated parking locations based on whether they were judged to generate safety issues. Areas of undesignated parking just outside of the Boulevard CID region were not added to Table 1 or Figure 21. A significant location is the overflow parking that occurs adjacent to the truck parking facility northeast of the Boulevard CID.

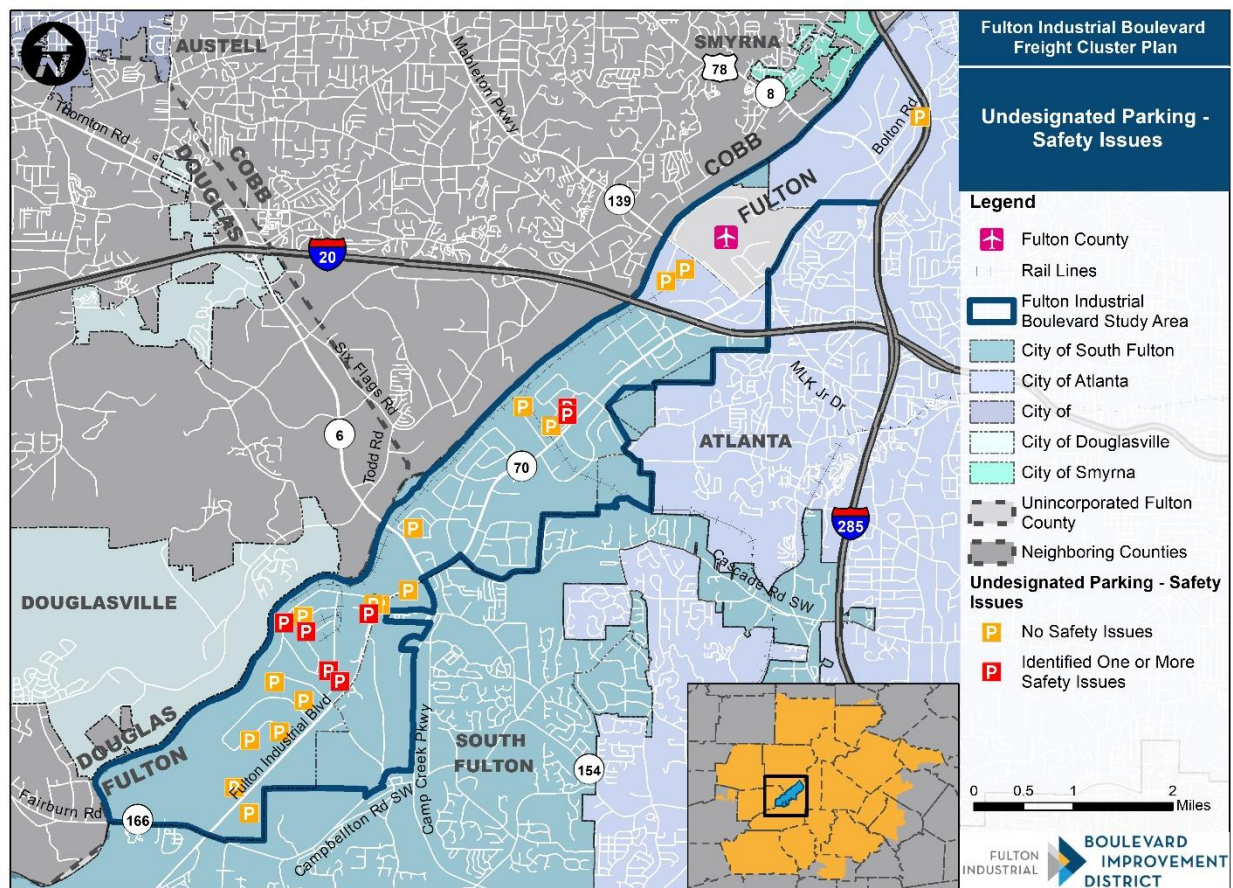
Table 1: Locations of Undesignated Truck Parking

Location #	Location	Truck Park Location	GPS Identification	Field Identification	Clear safety issues?	Parking on Grass/Shoulder
1	1515 Northwest Dr.	Dead end		X	No	No
2	650 Distribution Dr.	Cul-de-sac	X		No	No
3	1 National Dr.	Cul-de-sac and in lane next to cul-de-sac		X	No	No
4	36 Enterprise Blvd.	In lane	X	X	Passing vehicles	No
5	55 Enterprise Blvd.	In lane next to turnaround		X	No	No
6	120 James Aldredge Blvd.	In lane		X	Passing vehicles	No
7	5225 Phillip Lee Dr.	Dead end/across railroad	X	X	No	Parking on dirt next to railroad
8	780 Wesleyan Dr.	Cul-de-sac and in lane next to cul-de-sac		X	No	No
9	6001 Boat Rock Blvd.	Empty lot at north corner	X		No	No
10	925 Greensboro Dr.	On grass between Greensboro and FIB	X		No	On grass
11	100 Fisk Dr.	In lane		X	Passing vehicles - blocked sightlines around curve	No
12	6125 Xavier Dr.	Dead end/In lane	X		No	No
13	7035 Lagrange Blvd.	In lane		X	One lane blocked	No
14	7050 Lagrange Blvd.	In lane		X	One lane blocked	No
15	6180 Purdue Dr.	In lane		X	Passing vehicles	No
16	6300 Duquesne Dr.	In lane		X	Passing vehicles	No
17	6500 Tradewater Pkwy.	In faux cul-de-sac	X	X	No	No
18	1635 Westgate Pkwy.	In lane			No	No
19	1833 Westgate Pkwy.	In lane			No	No

20	John F Varley Ct.	Cul-de-sac and in lane next to cul-de-sac	X	X	No	No
21	Lakeview Ct.	In lane	X	X	No	No
22	Eagle Vista Pkwy.	Cul-de-sac	X		No	No
23	Kendall Park Ln.	In lane	X	X	No	No

Source: INRIX Data and Consultant field observation

Figure 21: Map of Undesignated Parking Locations



Source: Consultant analysis of INRIX Data

4 EXISTING CONDITIONS AND PERFORMANCE

4.1 Roadway Characteristics

This section describes the roadway system in the Boulevard CID. The roadway characteristics considered in this section include Functional Classification (the role of each roadway in the overall roadway network), Lane Configuration (how many lanes make up each direction of travel), and Lane Widths (the typical widths of the lanes on a roadway), and Bridge Characteristics.

4.1.1 Functional Classification

FHWA classifies roadways based on their role in serving the flow of traffic through the roadway network in a hierarchy called functional classification. Planners and engineers use this hierarchy to properly channel transportation movements through a roadway network efficiently. Table 2 lists the seven functional classifications and their definitions by FHWA.

Table 2: Functional Classification Definitions

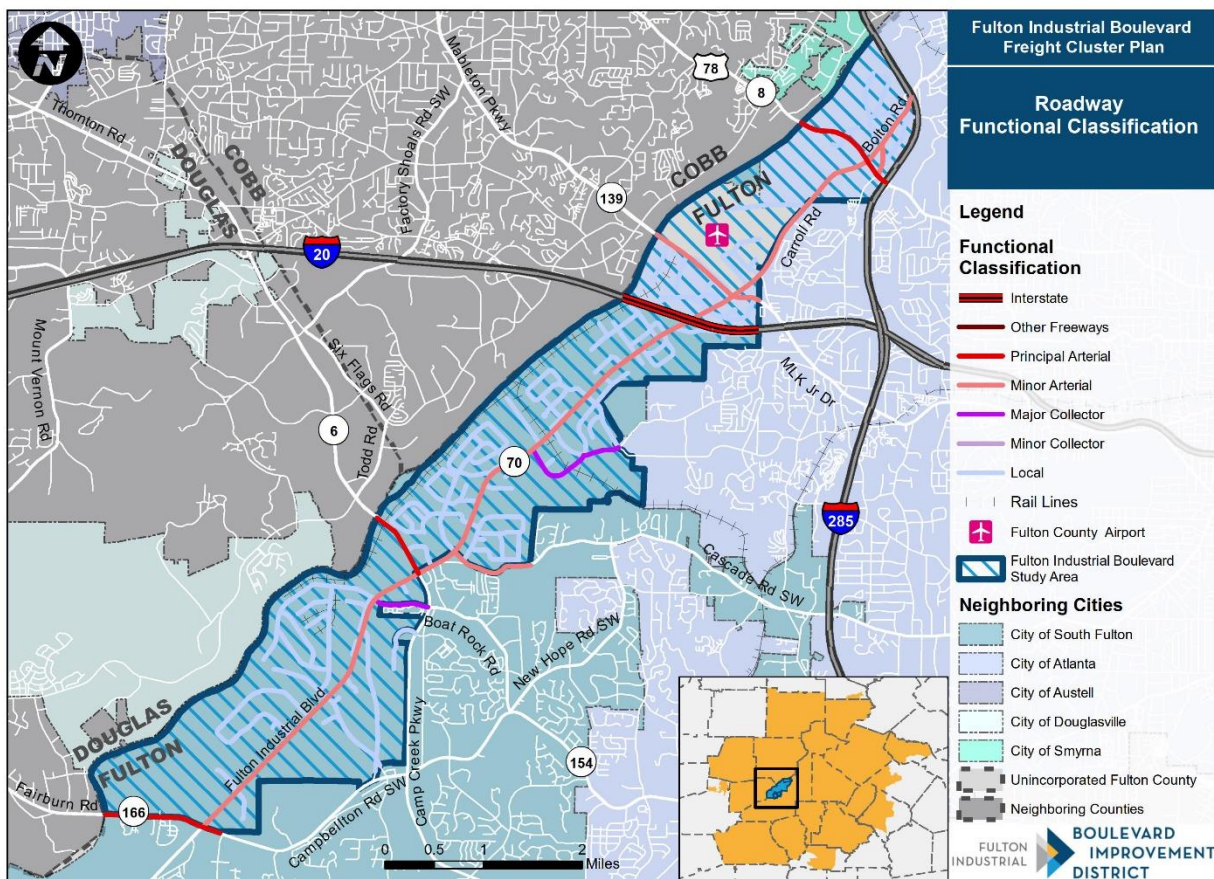
Functional Classification	Definition
Interstates	Roadways officially designated as Interstates by the Secretary of Transportation.
Other Freeways and Expressways	Roadways with directional travel lanes, usually separated by some type of physical barrier, with access and egress points limited to on- and off-ramp locations or a very limited number of at-grade intersections.
Other Principal Arterials	Roadways that serve major centers of metropolitan areas and provide a high degree of mobility through urban and rural areas. These roadways are not access-controlled, so abutting land uses can be served directly via driveways.
Minor Arterials	Roadways that service trips of moderate length and serve geographic areas that are smaller than their higher Arterial counterparts. These roadways interconnect and augment the higher Arterial system, provide intra-community continuity, and may carry local bus routes.
Major Collectors	Roadways that gather traffic from Local Roads and funnel them to the Arterial network. These roadways are longer in length, have lower driveway densities, have higher speed limits, are spaced at greater intervals, have higher annual average traffic volumes, and may have more travel lanes than Minor Collectors.
Minor Collectors	Roadways that gather traffic from Local Roads and funnel them to the Arterial network, but are shorter, have higher driveway densities, have lower speed limits, are spaced at smaller intervals, have lower annual average traffic volumes, and may have fewer travel lanes than Major Collectors.
Local Roads	These roadways account for the largest percentage of all roadways in terms of mileage. They are not intended for use in long distance travel, except at the origin or destination end of a trip, due to their provision of direct access to abutting land. They are often designed to discourage through traffic.

Source: FHWA

Figure 22 shows the functional classification of the roadways in the study area, as designated by FHWA. I-20 is the only Interstate within the study area, while I-285 bounds the northern portion of the study area but is not included. The main thoroughfare through the study area, SR 70/Fulton Industrial Boulevard, is

classified as a Minor Arterial. SR 70/Fulton Industrial Boulevard is a crucial route for trucks to quickly and easily transfer between industrial sites and the Principal Arterials (SR 8/US 78/US 278/Donald L. Hollowell Parkway, SR 6/Camp Creek Parkway, and SR 154/Campbellton Road) and the Interstates, I-20 and I-285, as they begin and end their journeys. Other major cross-routes that intersect SR 70/Fulton Industrial Boulevard include SR 139/Martin Luther King Jr. Drive and Cascade R Road, which are also Minor Arterials. The Major Collector roadways in the study area include Boat Rock Road as well as parts of Selig Drive and Bakers Ferry Road. These roadways collect and distribute traffic between local roads and the arterials. The rest of the roadways in the study area are considered Local Roads, a majority of which provide direct access to industrial sites.

Figure 22: Roadway Functional Classification



Source: ARC

4.1.2 Designated Truck Routes

The Boulevard CID study area contains multiple truck routes, or roadways that are recommended for truck travel due to their capability of facilitating large vehicles. There are four sets of designated truck routes that are part of the study area, described below.

4.1.2.1 National Highway Freight Network

The National Highway Freight Network (NHFN) resulted from a combination of the Primary Freight Network and the National Freight Network through the Fixing America's Surface Transportation Act (FAST Act). It was created by FHWA and contains four subsystems, as described in Table 3.

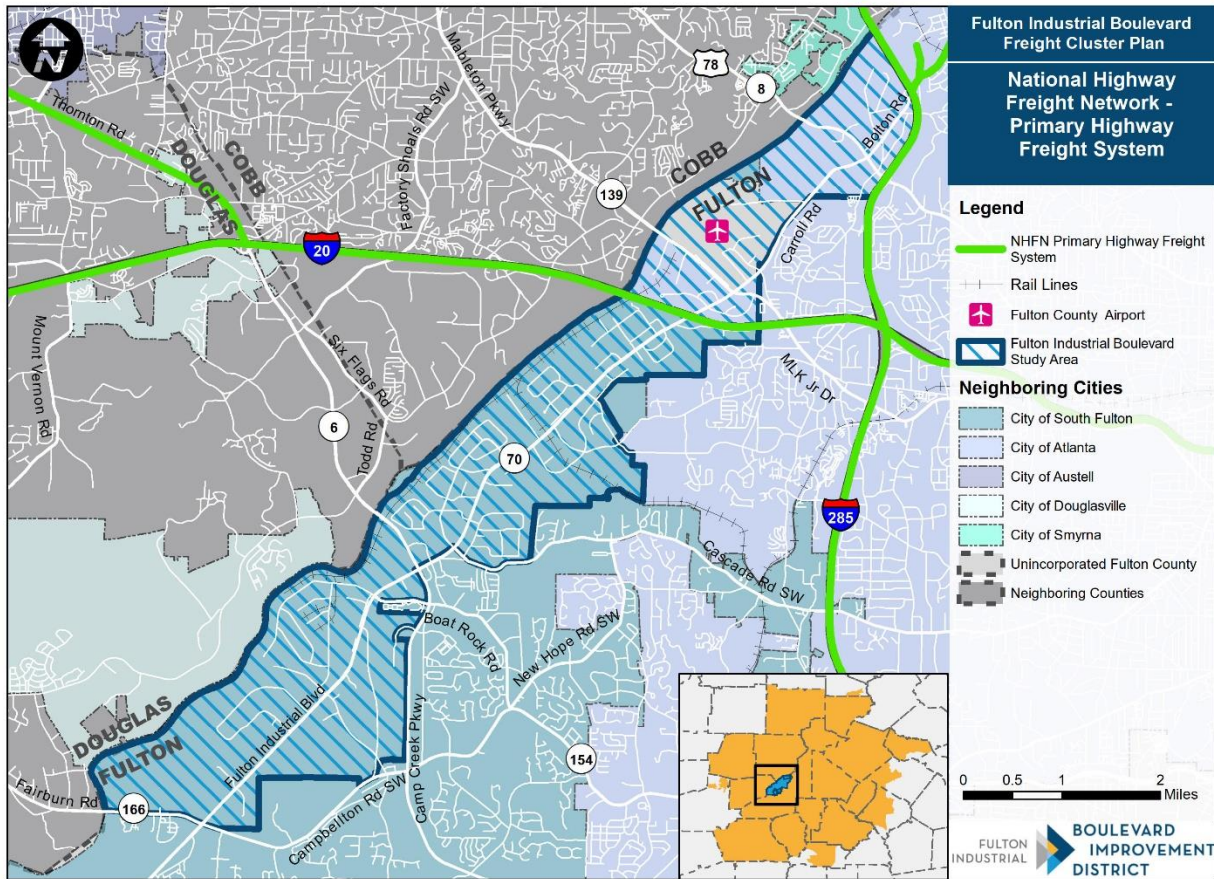
Table 3: National Highway Freight Network Subsystems

Subsystem	Definition
Primary Highway Freight System (PHFS)	This is a network of highways identified as the most critical highway portions of the U.S. freight transportation system determined by measurable and objective national data. The network consists of 41,518 centerlines miles, including 37,436 centerline miles of Interstate and 4,082 centerline miles of non-Interstate roads.
Other Interstate portions not on the PHFS	These highways consist of the remaining portion of Interstate roads not included in the PHFS. These routes provide important continuity and access to freight transportation facilities. These portions amount to an estimated 9,843 centerline miles of Interstate, nationwide, and will fluctuate with additions and deletions to the Interstate Highway System.
Critical Rural Freight Corridors (CRFCs)	These are public roads not in an urbanized area which provide access and connection to the PHFS and the Interstate with other important ports, public transportation facilities, or other intermodal freight facilities. Nationwide, there are 4,412 centerline miles designated as CRFCs.
Critical Urban Freight Corridors (CUFCs)	These are public roads in urbanized areas which provide access and connection to the PHFS and the Interstate with other ports, public transportation facilities, or other intermodal transportation facilities. Nationwide, there are 2,213 centerline miles designated as CUFCs.

Source: FHWA

Figure 23 shows the NHFN corridors in the study area. I-285, I-20, and, just outside of the study area, Bolton Road and Parrot Avenue are all part of the network, along with SR 6/Thornton Road in Douglas County. All of these corridors are all part of the Primary Highway Freight System (PHFS), meaning they make up the most critical highway portions of the national freight transportation system.

Figure 23 : National Highway Freight Network Routes



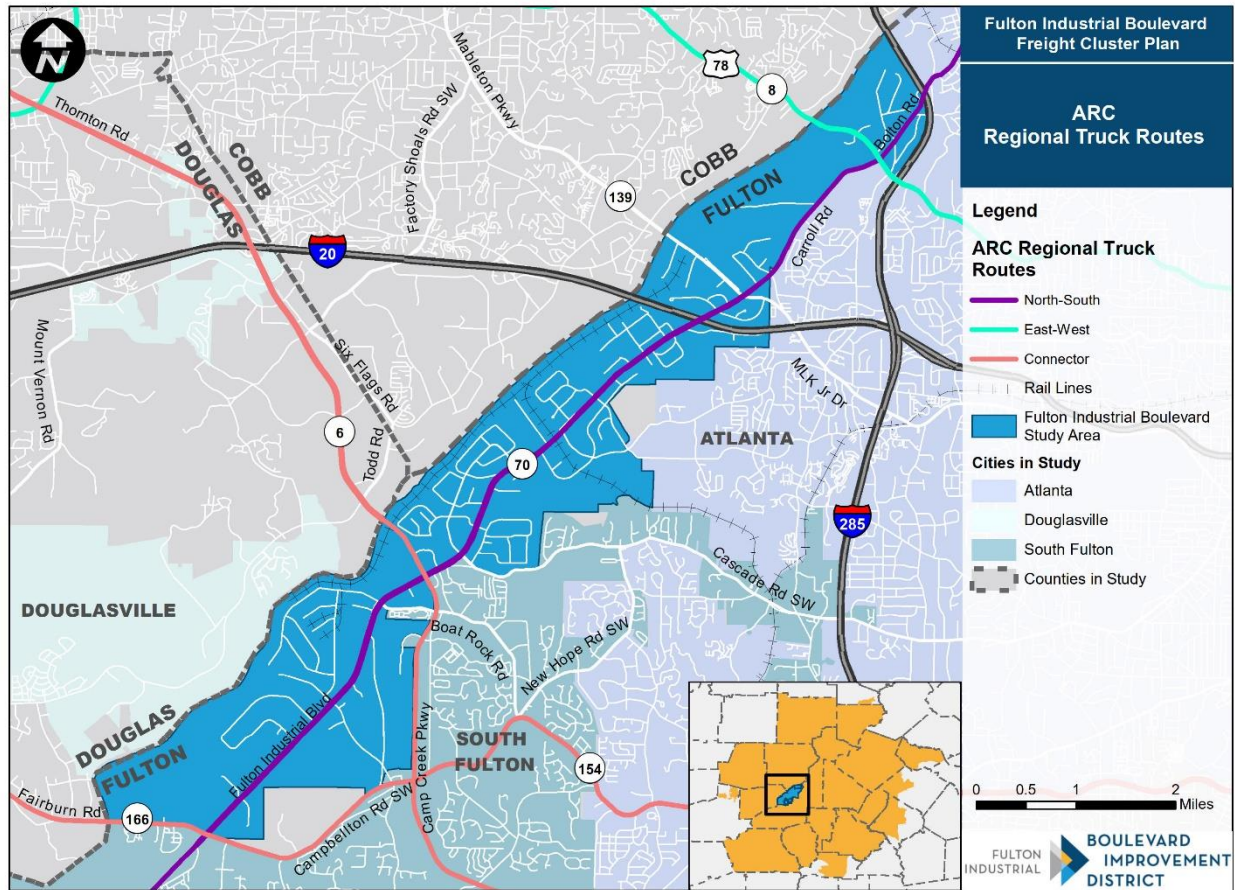
Source: FHWA

4.1.2.2 ARC Regional Truck Routes

As part of the Atlanta Strategic Truck Route Master Plan (ASTRoMaP), ARC identified important freight routes throughout the 20-county region. Roadways were rated via a number of quantitative and qualitative criteria, and the methodology for determining the network included a “path of least resistance” component, defined by roadways with a good composite rating, and a “grid” component, defined by designating both North-South and East-West routes. As such, the regional truck routes are classified as either North-South, East-West, or Connector.

Within the study area, there are four regional truck routes, as shown in Figure 24. SR 70/Fulton Industrial Boulevard is classified as a North-South route, SR 8/US 78/US 278/Donald L. Hollowell Parkway is classified as an East-West route, and both SR 6/Camp Creek Parkway and SR 154/Campbellton Road are considered Connectors. Because of their designations, these routes play a major role in inter-Atlanta freight movement, especially transportation among freight clusters.

Figure 24: ARC Regional Truck Routes

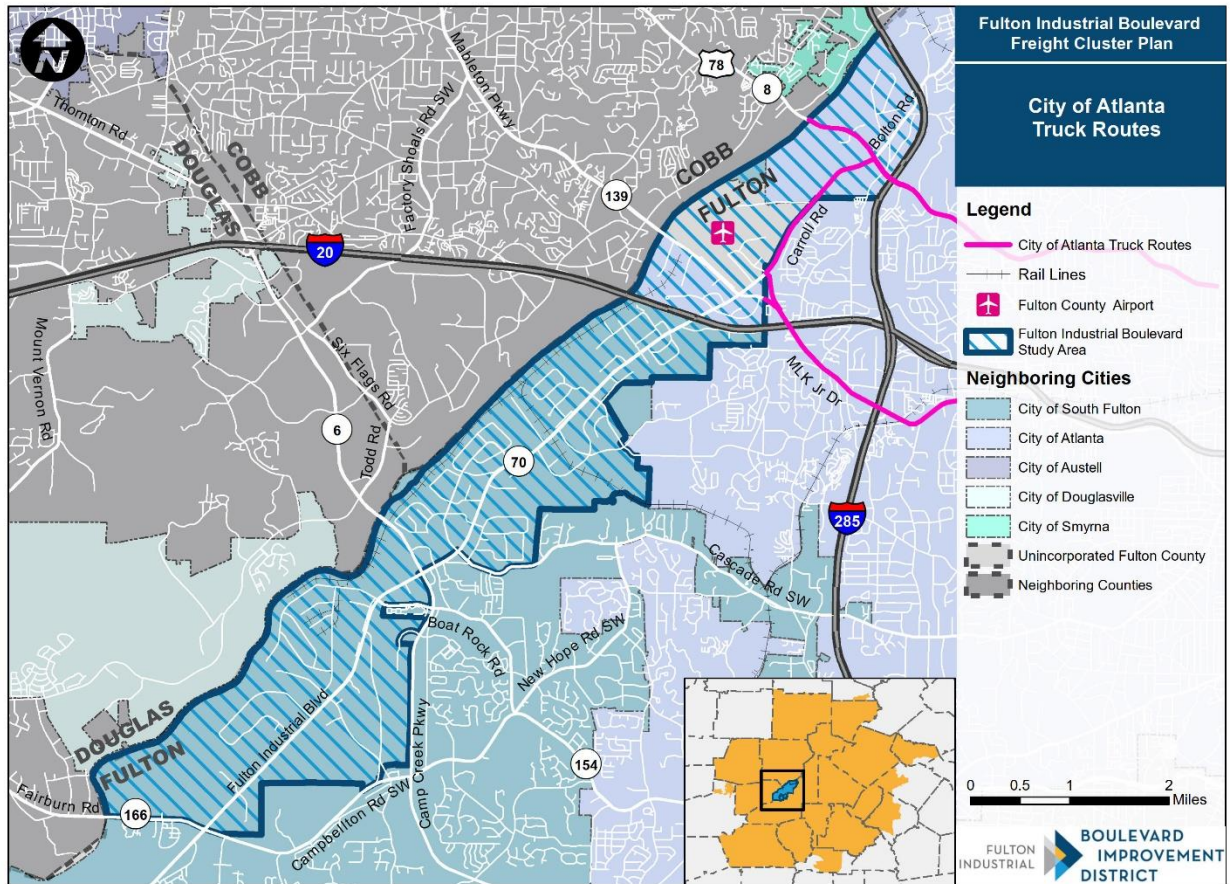


Source: ARC

4.1.2.3 City of Atlanta Truck Routes

As part of Cargo Atlanta: A Citywide Freight Study, the City of Atlanta set out to compile data from FHWA, ARC, and the City to create a freight route map within the city limits. The FHWA and ARC truck routes are shown in the above two figures, but Figure 25 shows the city-designated truck routes, which were initially introduced in the city's 1952 truck route map. These truck routes include the portions of SR 8/US 78/US 278/Donald L. Hollowell Parkway, SR 70/Fulton Industrial Boulevard, SR 139/Martin Luther King Jr. Drive, and Old Gordon Road that lie within the city limits.

Figure 25: City of Atlanta Truck Routes



Source: City of Atlanta

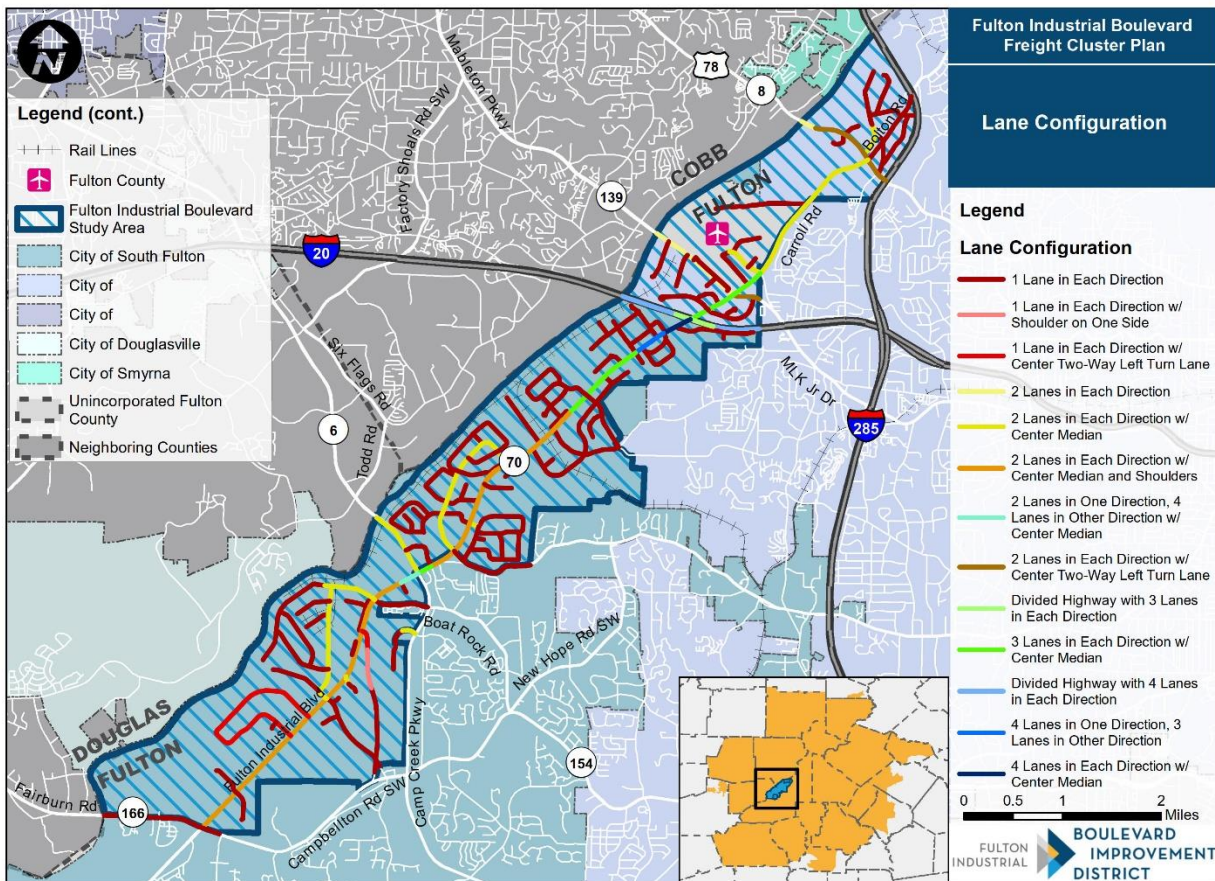
4.1.2.4 Oversized Truck Routes

Statewide, GDOT designates certain truck routes as Oversized Truck Routes, meaning these routes can accommodate trucks up to 14 ft wide, 14 ft 6 in tall, and 100 ft long, with a gross weight of up to 100,000 pounds. Within the study area, both SR 70/Fulton Industrial Boulevard and SR 6/Camp Creek Parkway are Oversized Truck Routes.

4.1.3 Lane Configuration

The lane configuration of each roadway in the Boulevard CID study area is shown in Figure 26. The lane configuration is shown for a typical section of the roadway, which represents how the roadway generally looks at segments away from intersections (so turn lanes are not included). Local Roads without a marked centerline were included in the “1 Lane in Each Direction” category.

Figure 26: Lane Configurations



Source: Google Earth and Consultant field observation

Roadways in the study area range from one lane in each direction to four lanes in each direction (for a short segment approaching I-20). Most have one lane in each direction, without a median, and are Local Roads. However, there are a few Local Roads with two lanes in each direction and a center median, including Great Southwest Parkway, Lagrange Boulevard, and parts of Boat Rock Boulevard and Aviation Cir. Additionally, three Arterials in the study area, Bolton Road, Cascade Road, and SR 154/SR 166 Campbellton Road, also have only one lane in each direction.

In the northern section of the study area, SR 70/Fulton Industrial Boulevard is configured with two lanes in each direction and a center raised median. For most of the section south of Mendel Drive, it also has two lanes in each direction, but instead with a grassy median and paved shoulders. In proximity to the I-20 interchange, SR 70/Fulton Industrial Boulevard gains a lane in each direction, and even has four lanes in each direction for a small segment directly south of I-20.

Lane configurations differ slightly for other Arterials in the study area. SR 139/Martin Luther King Jr. Drive, SR 6/Camp Creek Parkway, and SR 8/US 78/US 278/Donald L. Hollowell Parkway all have two lanes in each direction; however, SR 6/Camp Creek Parkway has a center median, and SR 8/US 78/US 278/Donald L. Hollowell Parkway has a center two-way left turn lane throughout most of the study area.

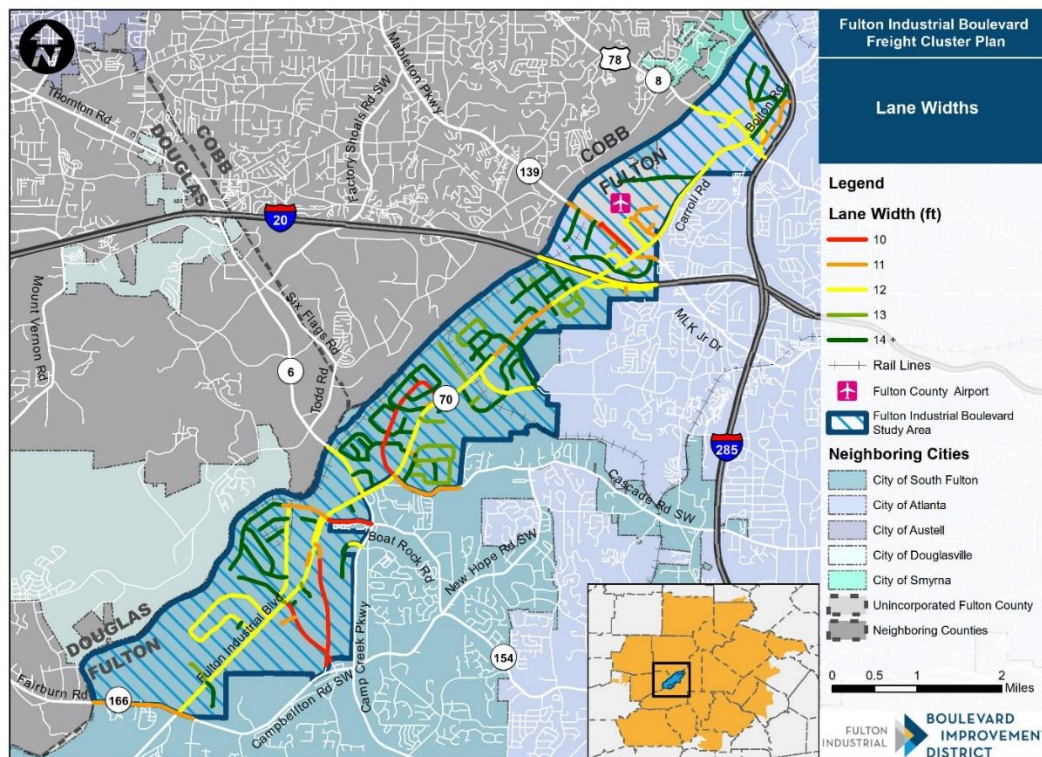
4.1.4 Lane Widths

The typical lane widths of the roadways in the study area are shown in Figure 27. Lane widths of 12 ft or more are favorable for trucks. The standard truck is around 8.5 ft wide, so lanes that are 10 or 11 ft wide provide little space on either side of the truck. However, it is important to consider that vehicles are more likely to drive faster on roadways with wider lanes, which can impact roadway/pedestrian safety.

Lane widths in the study area range from 10 ft to 20 ft. In general, the roadways with lane widths of 16 ft or greater are local roads that directly serve industrial land uses, which makes it easier for trucks to maneuver as they prepare to load and unload. Two of the roadways with 10 ft lane widths, Great Southwest Parkway and Plummer Road, are also local roads directly serving industrial land uses; however, the former has two lanes in each direction, and the latter has a 12 ft wide paved shoulder on one side in the area near the industrial land uses, both of which give trucks ample space to turn and maneuver.

SR 70/Fulton Industrial Boulevard has a consistent 12 ft lane width throughout the study area, and a paved shoulder width ranging from 10 to 12 ft in the southern half of the study area. This lane width is accommodating for trucks as they use SR 70/Fulton Industrial Boulevard, especially at the speeds seen on the roadway. The other Arterials and Collectors that intersect SR 70/Fulton Industrial Boulevard have lane widths of 11 or 12 ft, which are adequate for trucks as they use these roadways to access I-285 and other regions.

Figure 27: Lane Widths

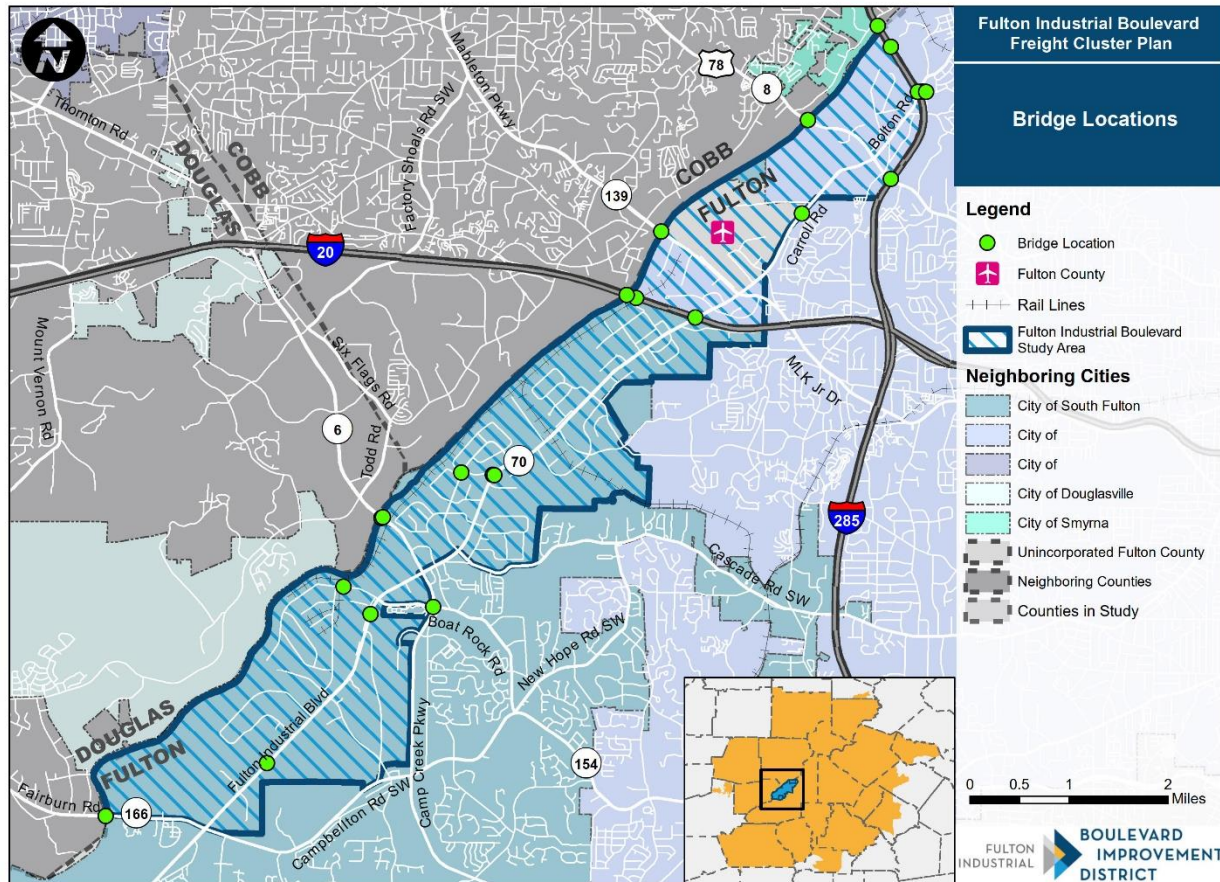


Source: Measurements from Google Earth

4.1.5 Bridges

There are 22 roadway bridges in the study area, as shown in Figure 28, which span railroads, waterways, and other roadways. This section looks at the characteristics of these bridges, including Sufficiency Rating, Load Rating, and Vertical Clearance.

Figure 28: Bridge Locations



Source: GDOT

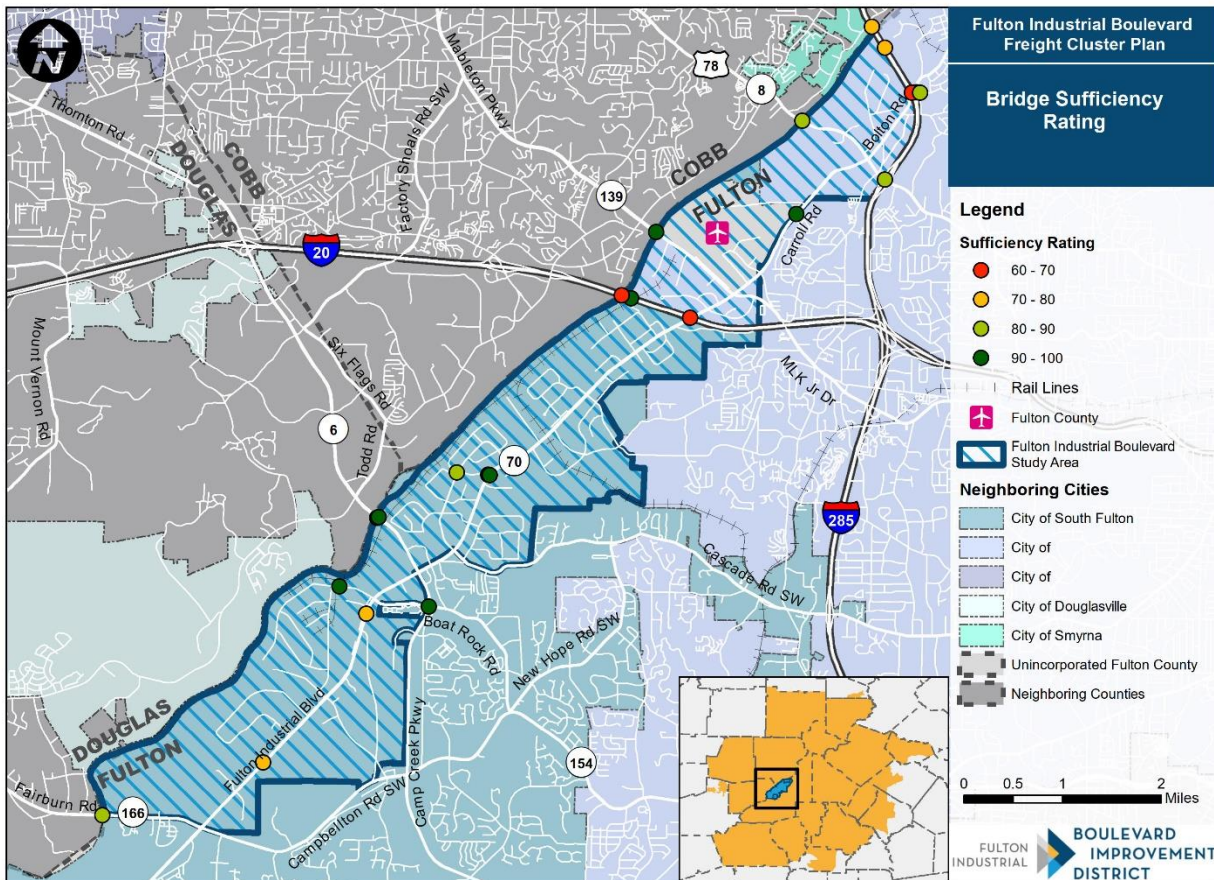
It should be noted that the SR 8/US 78/US 278/Donald L. Hollowell Parkway bridge over I-285 is set to be replaced as part of the I-285 Westside Express Lanes project under the Major Mobility Investment Program (MMIP). Construction on the bridge is set to start in 2023 and should be completed by 2026.

4.1.5.1 Sufficiency Rating

Bridge sufficiency rating was developed by FHWA to serve as a prioritization tool to allocate funds through FHWA's Highway Bridge Replacement & Rehabilitation Program (HBRRP). The three performance measures that comprise the sufficiency rating are: structural adequacy and safety (55 percent of the rating), serviceability and functional obsolescence (30 percent of the rating), and essentiality for public use (15 percent of the rating). The sufficiency rating ranges from 0 to 100; bridges with lower ratings will have higher priority for funding. Bridges with a sufficiency rating of 80 or less are eligible for rehabilitation funding, and bridges with a sufficiency rating of 50 or less are eligible for replacement funding.

The sufficiency rating of the bridges in the study area is shown in Figure 29. The bridge with the lowest sufficiency rating in the study area is the Bolton Road bridge over I-285/Proctor Creek, which has a rating of 63.2. The other bridges with a sufficiency rating between 60 and 70 include I-20 over SR 70/Fulton Industrial Boulevard, I-20 over the Chattahoochee River, and SR 70/Fulton Industrial Boulevard over Utoy Creek.

Figure 29: Bridge Sufficiency Ratings

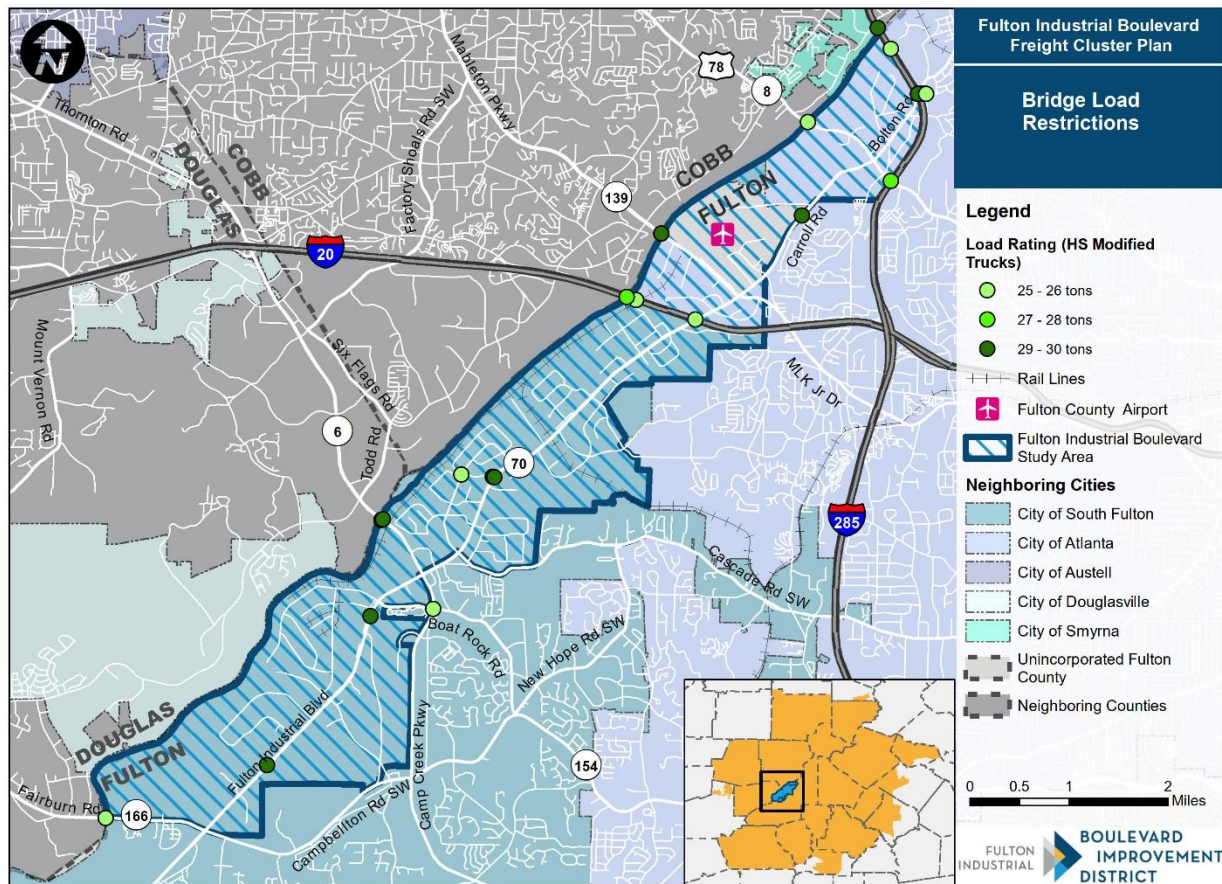


Source: GDOT

4.1.5.2 Load Rating

Bridges are given a load rating, stating the weight that the bridge is designed to withstand. The standard design vehicles used by GDOT for bridges are an HS20 truck (a standard semi-trailer truck) or an HL93 truck (either a standard semi-trailer or a semi-trailer with tandem axels). However, when considering whether a bridge should be posted (when weight restrictions are posted on a sign by the bridge), GDOT uses Legal and Specialized Hauling Vehicles as the design vehicles, and any bridge with a load rating under 36 tons for these vehicles will be posted.

The study area's bridge load ratings for an HS-modified truck (a standard semi-trailer truck configuration) are shown in Figure 30. The figure shows that all of the bridge load restrictions in the study area range from 25 to 30 tons. None of the bridges in the study area have posted weight restrictions.

Figure 30: Bridge Load Rating for Semi-Trailer Trucks

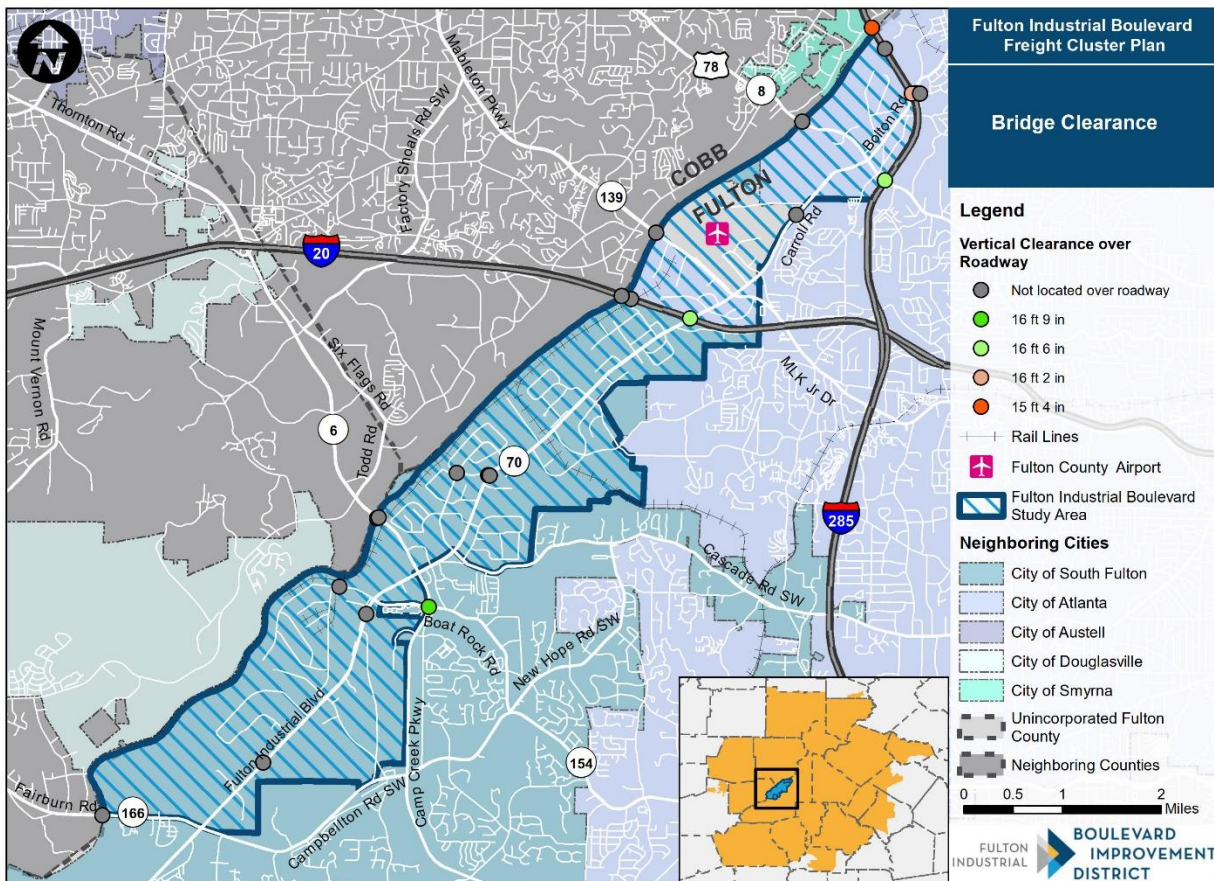
Source: GDOT

4.1.5.3 Vertical Clearance

The vertical clearance was identified for the five bridges that span other roadways in the study area, using Bridge Inspection Reports from GDOT, and can be seen in Figure 31. For bridges over Interstates, GDOT's standard minimum vertical clearance is 17 ft, but the clearance can be as low as 16 ft 6 in, with permission from the GDOT Bridge Office. The minimum vertical clearance over state routes (non-interstate) and local routes is 16 ft 9 in, although with permission it can be as low as 16 ft 6 in and 14 ft 6 in, respectively.

Of the five bridges that span other roadways in the study area, two are located above I-285: Bolton Road and SR 8/US 78/US 278/Donald L. Hollowell Parkway. The SR 8/US 78/US 278/Donald L. Hollowell Parkway bridge has a vertical clearance of 16 ft 6 in, while the Bolton Road bridge has a clearance of 16 ft 2 in. Two bridges span state routes, I-20 over SR 70/Fulton Industrial Boulevard and Boat Rock Road over SR 6/Camp Creek Parkway, which have vertical clearances of 16 ft 9 in and 16 ft 6 in, respectively. The last bridge is the I-285 bridge over the Chattahoochee River and Riverview Road, which has a 15 ft 4 in vertical clearance over Riverview Road. This bridge is within the study area, but the point where it crosses Riverview Road is just outside of the study area in Cobb County.

Figure 31: Bridge Clearances



Source: GDOT

4.2 State of Good Repair

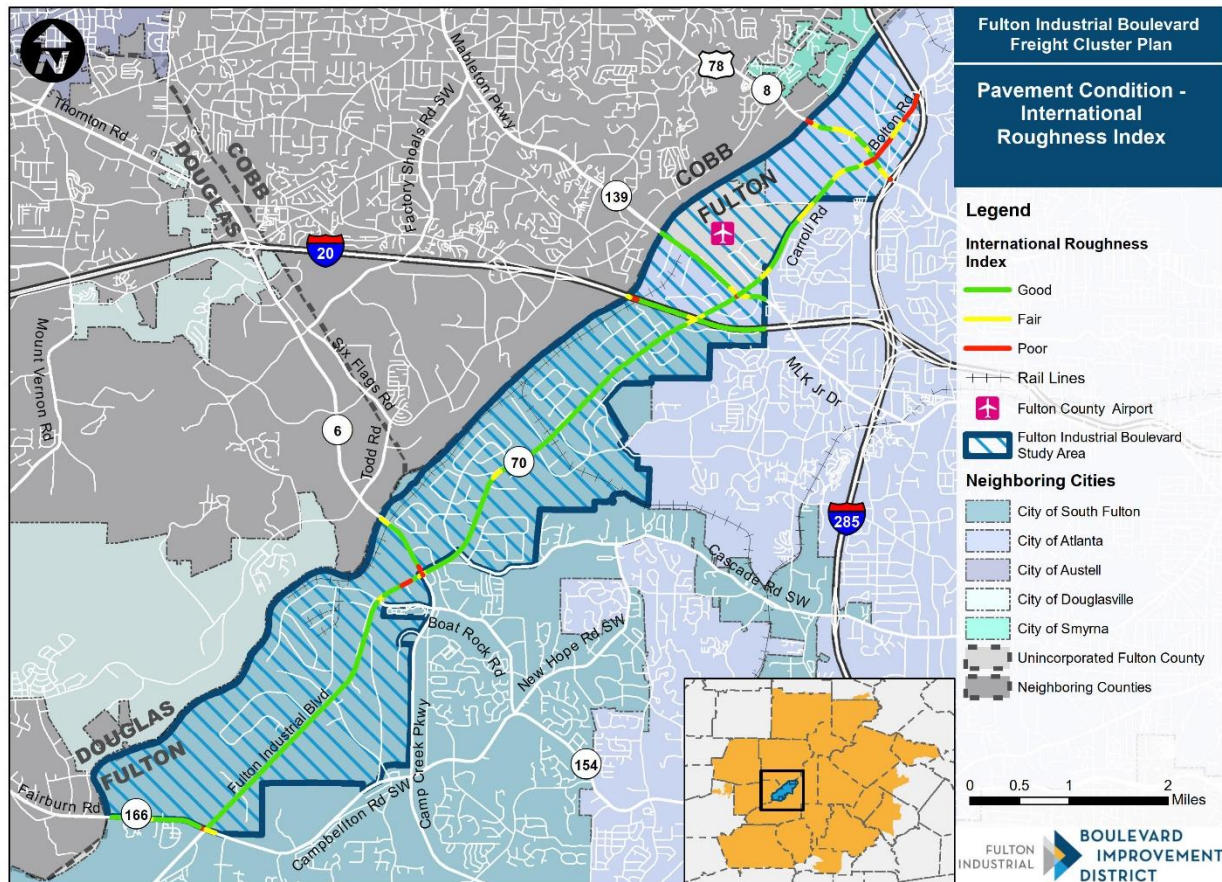
This section details the condition of the transportation assets within the Boulevard CID area, and what areas should be prioritized for maintenance. The condition of the pavements and the curbs in the study area were the two areas of focus in this assessment.

4.2.1 Pavement Condition

The condition of the roadway surfaces was analyzed using two metrics: International Roughness Index (IRI) and Present Serviceability Rating (PSR). GDOT keeps track of pavement condition on state routes, and the data is submitted to FHWA for its Highway Performance Monitoring System (HPMS). Pavement condition on state routes is measured via the IRI. In the study area, this includes I-20, SR 70/Fulton Industrial Boulevard/Bolton Road, SR 8/US 78/US 278/Donald L. Hollowell Parkway, SR 139/Martin Luther King Jr. Drive, SR 6/Camp Creek Parkway, and SR 154/SR 166 Campbellton Road. The IRI is calculated by measuring the profile along the roadway and analyzing the size of surface deviations that impact vehicle suspension movement. IRI measurements are grouped into three categories: Good (less than 95 inches/mile), Fair (between 95 and 170 inches/mile), and Poor (greater than 170 inches/mile). The IRI for the state routes in the study area is shown in Figure 32. The majority of the state routes in the study area

have a Good IRI rating. Locations with Fair or Poor IRI ratings are typically located near major intersections. The locations with Poor pavement conditions are located on Bolton Road where it crosses I-285, SR 70/Fulton Industrial Boulevard near SR 8/US 78/US 278/Donald L. Hollowell Parkway, I-20 and SR 8/US 78/US 278/Donald L. Hollowell Parkway as they approach their respective bridges over the Chattahoochee River, and at the intersection of SR 70/Fulton Industrial Boulevard and SR 6/Camp Creek Parkway.

Figure 32: Pavement Condition (IRI)



Source: FHWA

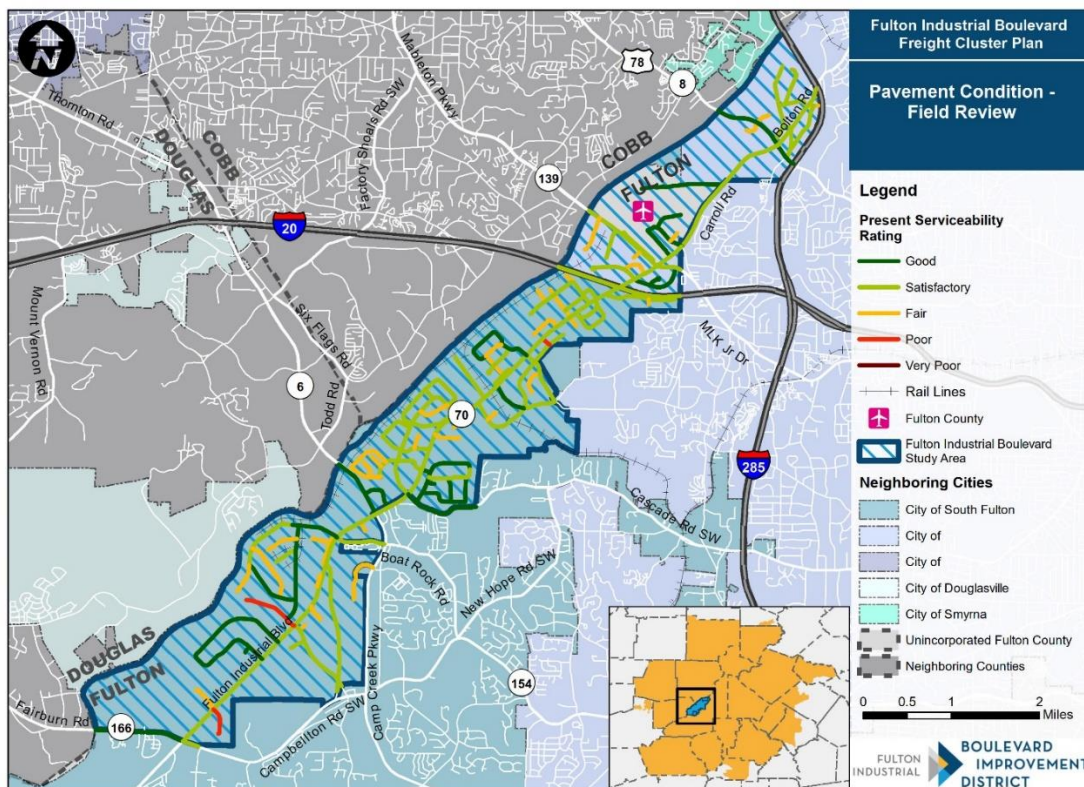
The pavement condition of all roadways in the study area was also measured using the PSR, which was developed by the American Association of State Highway Transportation Officials (AASHTO). The PSR is measured by visual inspection; the criteria for each category is shown in Table 4 below.

Table 4: PSR Categories

Category	Description
Good	Pavement appears to be new (or nearly new), smooth, and generally free of cracks, patches and signs of distress.
Satisfactory	Pavements in this category do not appear to be new but exhibit few visible signs of surface deterioration. This includes evidence of rutting and fine random cracks.
Fair	Pavements in this category are noticeably inferior to those of new pavements. They exhibit surface defects such as rutting, map cracking, and extensive patching.
Poor	Pavements in this category have deteriorated to such an extent that they appear to affect the flow of traffic. They are characterized by potholes and deep cracks. Other distresses include raveling, cracking, rutting and occurs over a large portion of the surface.
Very Poor	Pavements in this category are very deteriorated. Traffic appears to navigate the facility at reduced speeds. Distresses are visible over most of the surface and include large potholes and deep cracks.

Source: FHWA

Figure 33 shows the PSR for the roadways in the study area. PSR data was collected during a field visit in April 2021, where the project team drove every roadway in the corridor to observe pavement condition. As shown in the figure, there are no roadways in the study area with a Very Poor PSR. The roadways with a Poor PSR are Robinson Drive, Tradewater Parkway, and Kendall Park Ln. Around 50 percent of roadways in the study area have either a Good or Satisfactory PSR.

Figure 33: Pavement Condition (PSR)

Source: Consultant field observation

4.2.2 Curb Condition

A number of intersections in the study area were observed to have cracked curbs or off-road ruts, indicating these curbs are often mounted by turning trucks, which could signify a problem with the turning radii at these intersections. Figure 34 shows an example of a cracked curb and significant off-road rutting at the intersection of SR 70/Fulton Industrial Boulevard and Phillip Lee Drive.

Figure 34: Curb Cracking and Off-Road Rutting at Intersection of SR 70/Fulton Industrial Boulevard & Phillip Lee Drive

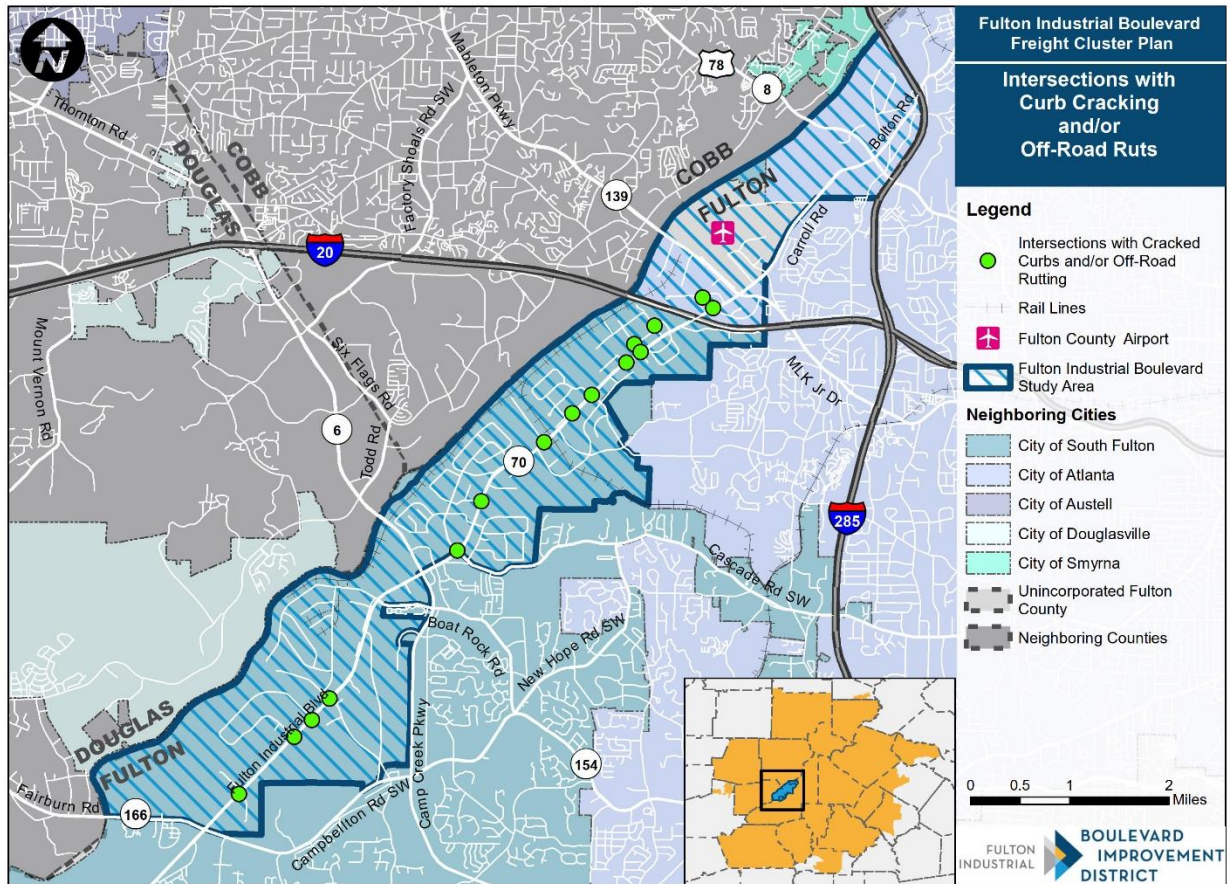


Source: Consultant field observation

Intersections where significant curb cracking and/or off-road rutting was observed are shown in Figure 35. This data was collected during the aforementioned field visit. A majority of the intersections with observed curb cracking or off-road rutting are along SR 70/Fulton Industrial Boulevard. One explanation for this phenomenon is that trucks turning onto local roads from SR 70/Fulton Industrial Boulevard are transitioning from a high speed onto a narrow road, resulting in a maneuver that may be difficult to complete without mounting the curb.

The standard minimum turning radius for a semi-trailer truck is 45 ft, so at intersections with smaller turning radii, especially those with high truck volumes, it may be beneficial to increase the turning radii. However, larger turning radii can affect the safety of pedestrians, as they increase the distance a pedestrian has to cross the roadway and allow other vehicles to make turns at a higher rate of speed. Therefore, in areas with high pedestrian activity, it is important to weigh the costs and benefits of increasing turning radii.

Figure 35: Intersections with Curb Cracking and/or Off-Road Ruts



Source: Consultant field observation

4.3 Vulnerable Transportation Assets

One important consideration of the overall transportation network is its vulnerability to natural or human disasters. The Boulevard CID is exposed to many types of risks that could adversely affect its transportation system and impact businesses negatively. The main natural risk faced by the CID is flooding related, given that the Chattahoochee River runs across north of the CID. However, other natural risks are also possible, including from severe storms. In May of 2021 a tornado made touchdown in the CID, causing significant damage to several facilities. However, this damage was cleaned relatively quickly, and operations resumed normality soon after.

4.3.1 Flooding

The Chattahoochee River and its tributaries are the main sources of flooding potential in the study area. Flooding potential data from the Federal Emergency Management Agency (FEMA) was analyzed in and around the study area, and the results are shown in Figure 36. The analysis included flooding potential for both 100-year and 500-year flooding events, which are defined as major floods that statistically on average occur every 100 and 500 years, respectively. Flooding can affect freight movement in three main ways: causing roadways and railways to become impassable due to high water or debris, causing immediate or

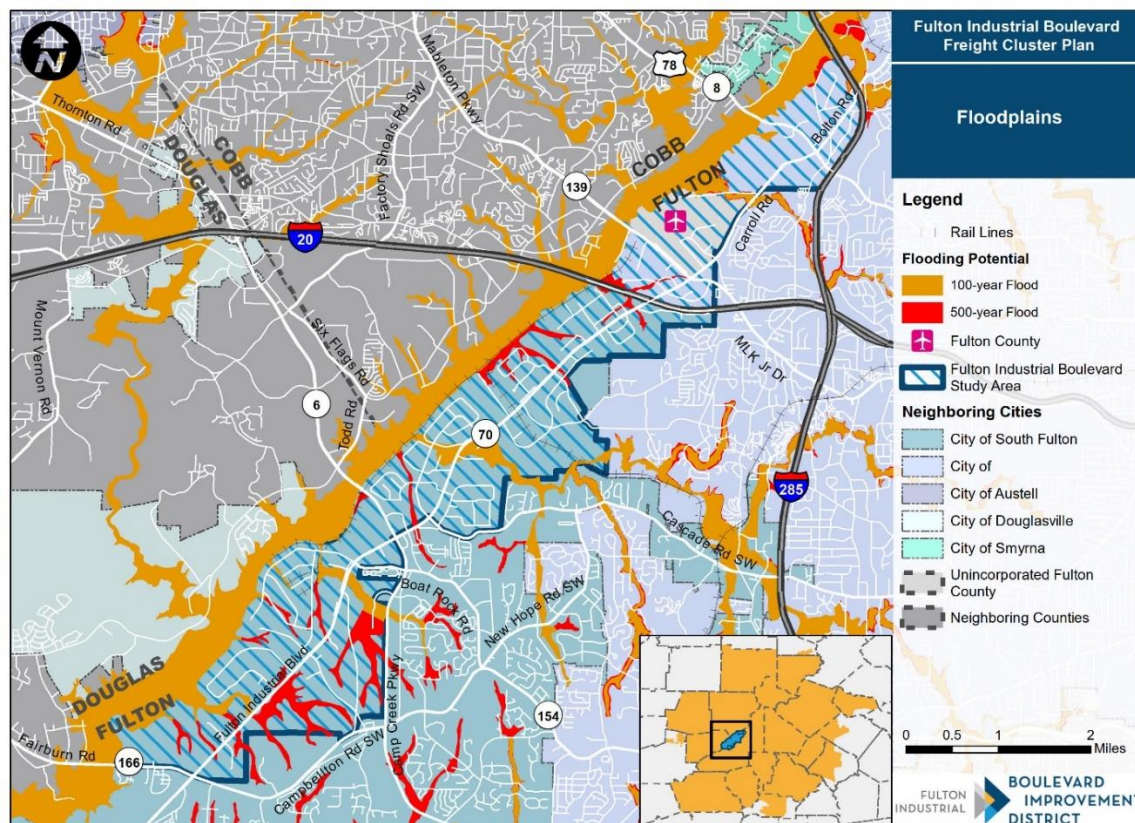
long-term pavement and rail damage, or moving and damaging freight equipment, such as parked truck trailers or forklifts.

The Fulton County Railroad runs parallel to the Chattahoochee River, and would be significantly affected by a 100-year flooding event. The roadways in the study area that would mainly be affected by an 100-year flooding event are those that are located near a tributary such as Sandy Creek (Sandy Creek Road and SR 70/Fulton Industrial Boulevard), Utoy Creek (Tulane Drive, Bucknell Drive, and SR 70/Fulton Industrial Boulevard), and the unnamed creek that crosses SR 70/Fulton Industrial Boulevard south of Boat Rock Road (SR 70/Fulton Industrial Boulevard and Westlake Parkway), or the roadways that are located near the Chattahoochee River, such as SR 154/Campbellton Road and Distribution Drive.

A 500-year flooding event would affect a few locations in addition to those mentioned above. The areas most affected by a 500-year flooding event are SR 70/Fulton Industrial Boulevard near Westgate Parkway, the area near the intersection of Lagrange Boulevard and Duquesne Drive, and Wharton Cir.

A monitoring station is located in the middle of the study area where the Utoy Creek meets the Chattahoochee River. The “flood stage” at this monitoring location is 18 feet and the “action stage” is 16 feet. The action stage indicates when flood mitigation procedures need to go into effect. Since 2010 the flood stage has been met once and the action stage five times according to data from the United States Geological Survey.

Figure 36: Floodplains



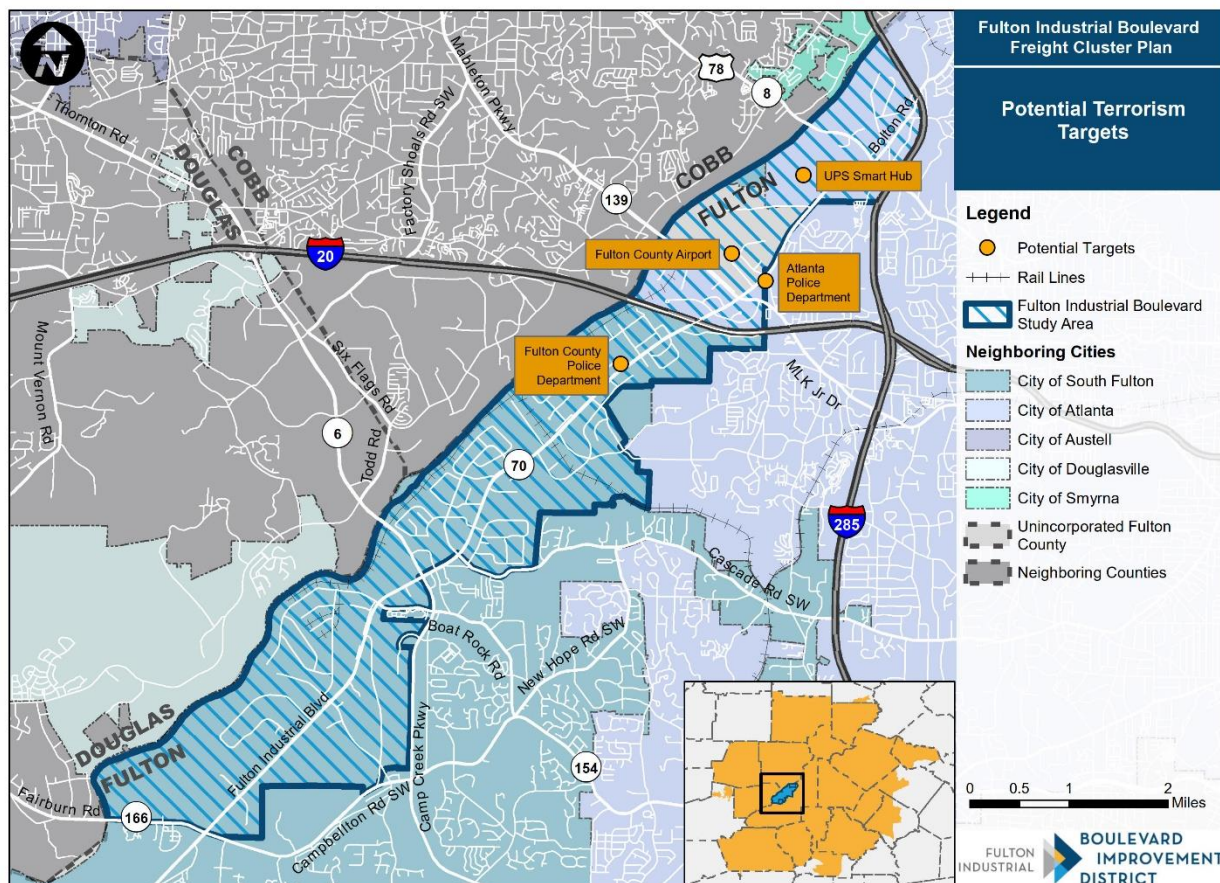
Source: ARC

4.3.2 Terrorism

Another threat in the study area is the threat of terrorism. Terrorism is defined as the unlawful use of violence and intimidation, especially against civilians, in the pursuit of political aims. In its 2020 Biennial National Strategy for Transportation Security, the Transportation Security Administration (TSA) says: “transportation assets may be targeted by terrorists, used as weapons, or used to execute attacks”. Thus, it is important to monitor the security of certain assets in the study area that may be vulnerable to terrorist attacks.

Figure 37 shows the four vulnerable transportation assets in the study area. The most vulnerable asset in the study area is the Fulton County Airport, due to the size of the property, making it difficult to monitor the entire property line, and the vulnerability of airplanes in general. Additionally, the UPS SMART Hub, which is the company’s second-biggest ground transportation hub in the U.S., and the two police stations in the study area may also be targets for terrorism.

Figure 37: Potential Terrorism Targets



Source: Consultant analysis

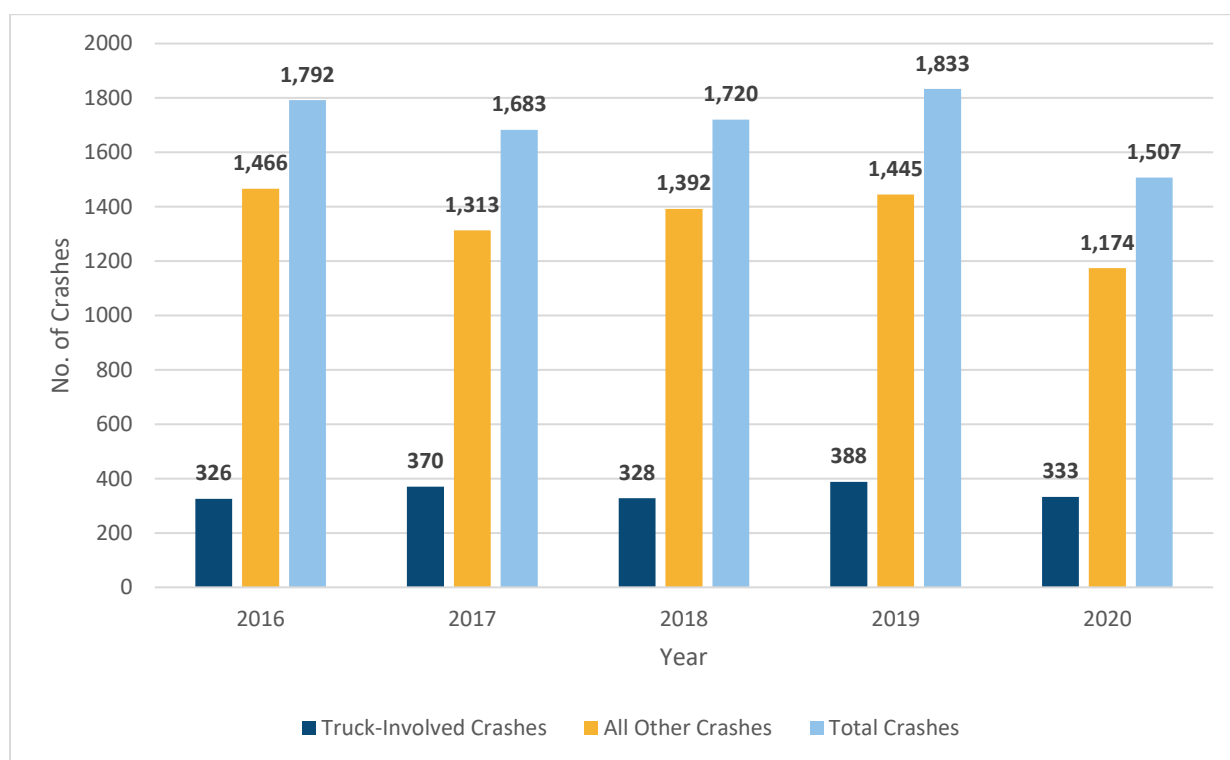
4.4 Safety Analysis

This section of the report examines the safety performance of the CID study area's freight system. Transportation safety is extremely important and is one of the highest priorities at all levels of transportation planning and engineering – national, statewide, and local. The safety analysis was conducted using data provided by the GDOT Crash Reporting Office for the 2016 to 2020 time period.

4.4.1 Crashes by Vehicle Type

Based on the data, there were 8,535 crashes in the study area over the analysis period (see Figure 38). Of that total, about 20 percent (1,745 crashes) involved trucks. In comparison, between 2016 and 2020 commercial vehicle crashes averaged about 4.4 percent of total crashes statewide.¹⁵ As shown in Figure 38, the years 2016 and 2020 represented high and low points, respectively, for crashes in the Boulevard CID. The total number of crashes peaked at 1,833 in 2019, while 2020 recorded the lowest number of crashes pre-pandemic.

Figure 38: Total Crashes, 2016 to 2020



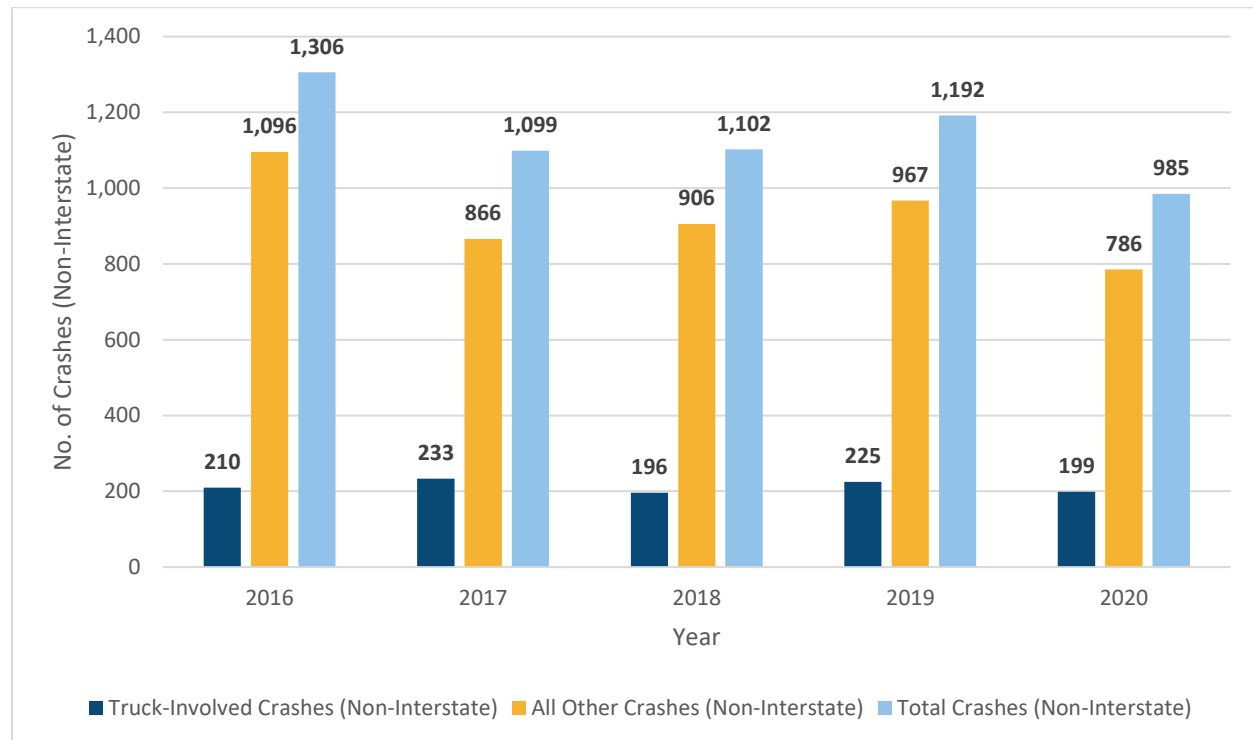
Source: GDOT, Crash Reporting Office; Consultant analysis

About two-thirds of all crashes over the analysis period (5,684 in total) occurred on non-Interstate roadways as shown in Figure 39. Of that total, about 19 percent (1,063 crashes) involved trucks. Crashes on non-

¹⁵ GDOT Georgia Electronic Accident Reporting System (GEARS) Database, www.gearsportal.com, accessed May 15, 2021.

Interstate roadways show a similar trend as total crashes as the years 2016 and 2020 represented high and low points, respectively, for crashes in the Boulevard CID.

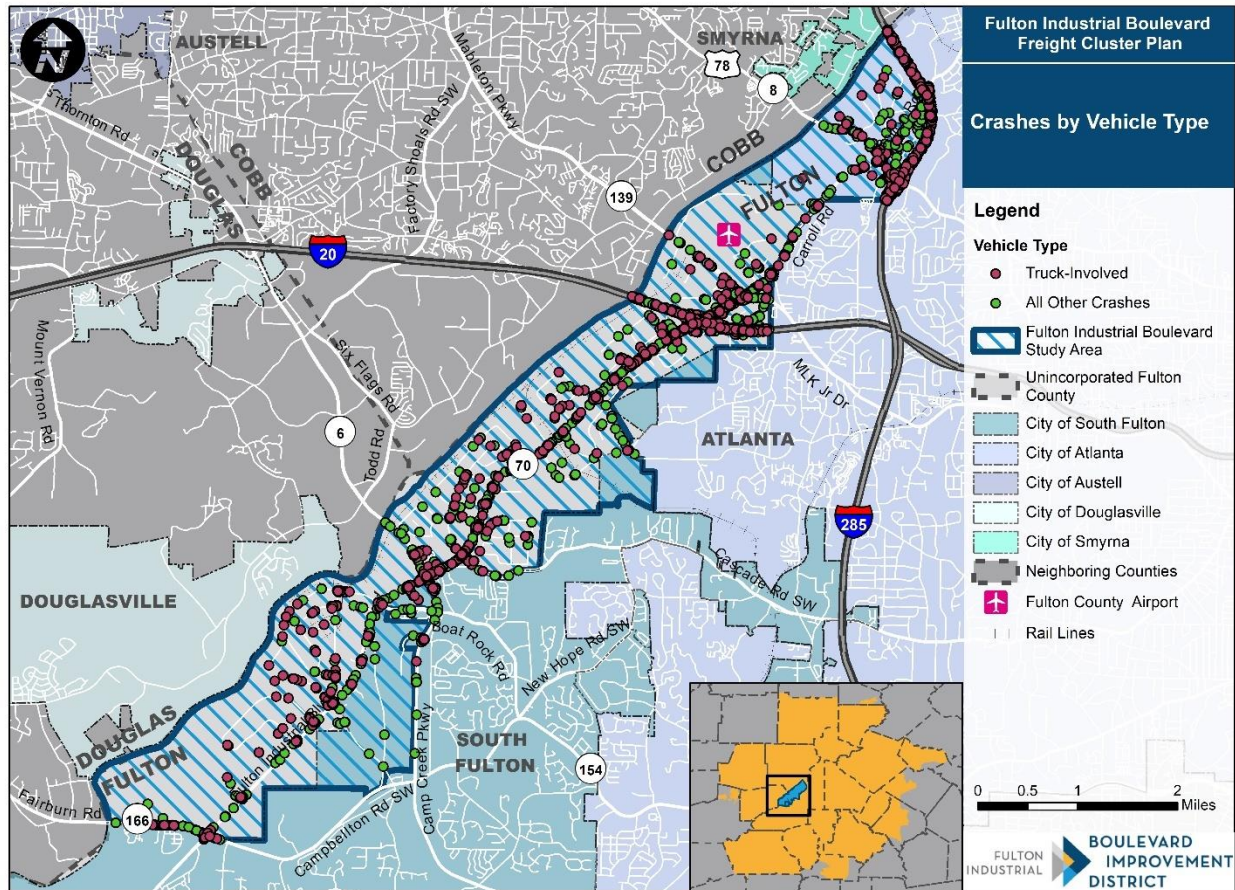
Figure 39: Total Crashes on Non-Interstate Roadways, 2016 to 2020



Source: GDOT, Crash Reporting Office; Consultant analysis

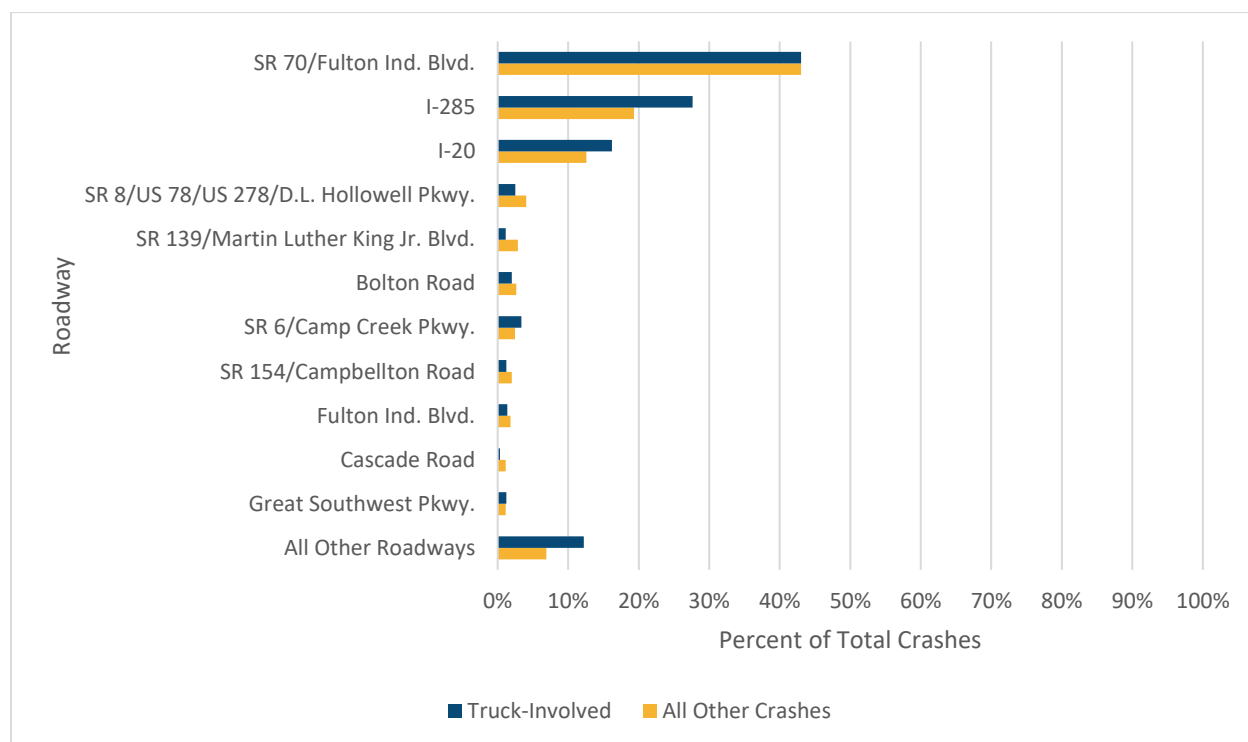
As can be seen in Figure 40 and shown in greater detail in Figure 41, most crashes in the study area (both truck-involved and non-truck-involved) are clustered along its major corridors. These include SR 70/Fulton Industrial Boulevard, I-285, and SR 8/US 78/US 278/Donald L. Hollowell Pkwy. These corridors accounted for about 77 percent of truck-involved crashes and 75 percent of all other crashes observed over the analysis period.

Figure 40: Crashes by Vehicle Type



Source: GDOT, Crash Reporting Office; Consultant analysis

Figure 41: Share of Crashes by Major Roadway, 2016 to 2020



Source: GDOT, Crash Reporting Office; Consultant analysis ¹⁶

Based on data from the Federal Railroad Administration (FRA), only one crash occurred at a highway-rail crossing over the analysis period. This crash occurred at crossing 6400071M, which is located on Boat Rock Boulevard east of Lagrange Boulevard. There were no injuries, and based on the FRA incident report, the crash occurred because of an employee error during a switching maneuver.

4.4.2 Crash Severity and Manner of Collision

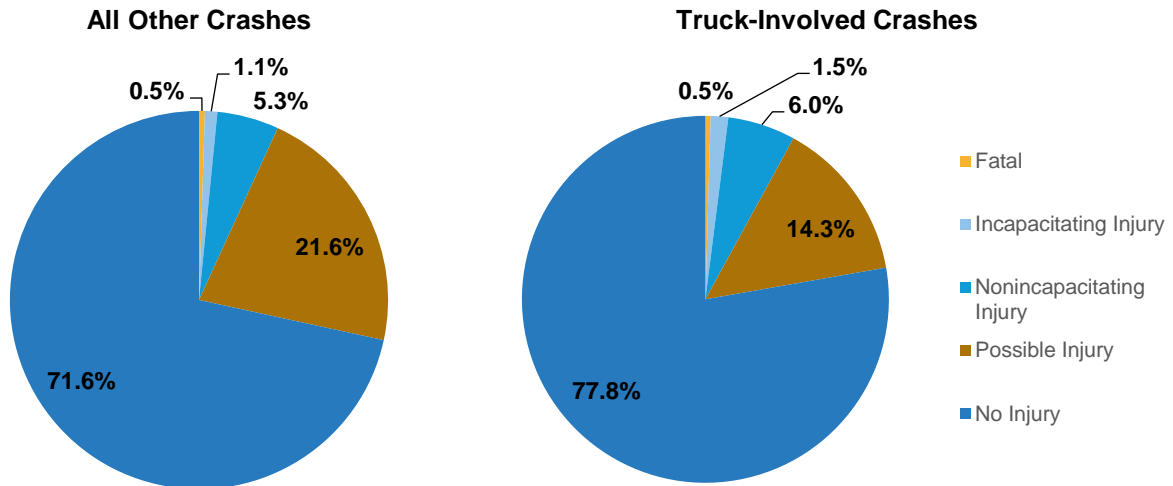
Most crashes in the study area did not result in an injury. As shown in Figure 42, about 78 percent of truck-involved and nearly 72 percent of non-truck-involved crashes resulted in no apparent injury to those involved. About 2 percent of crashes involving a truck resulted in a serious injury or fatality over the analysis period. This is slightly higher than the rate for all other crashes, as about 1.6 percent of those resulted in a serious injury or fatality.

Fatal and incapacitating injury crashes are primarily clustered along the SR 70/Fulton Industrial Boulevard corridor, as shown in Figure 43. Over the 2016-2020 analysis period, about 49 percent of fatal and

¹⁶ Note that Fulton Ind. Blvd. refers to the segment east of SR 8/US 78/US 278/Donald L. Hollowell Parkway where state ownership ends.

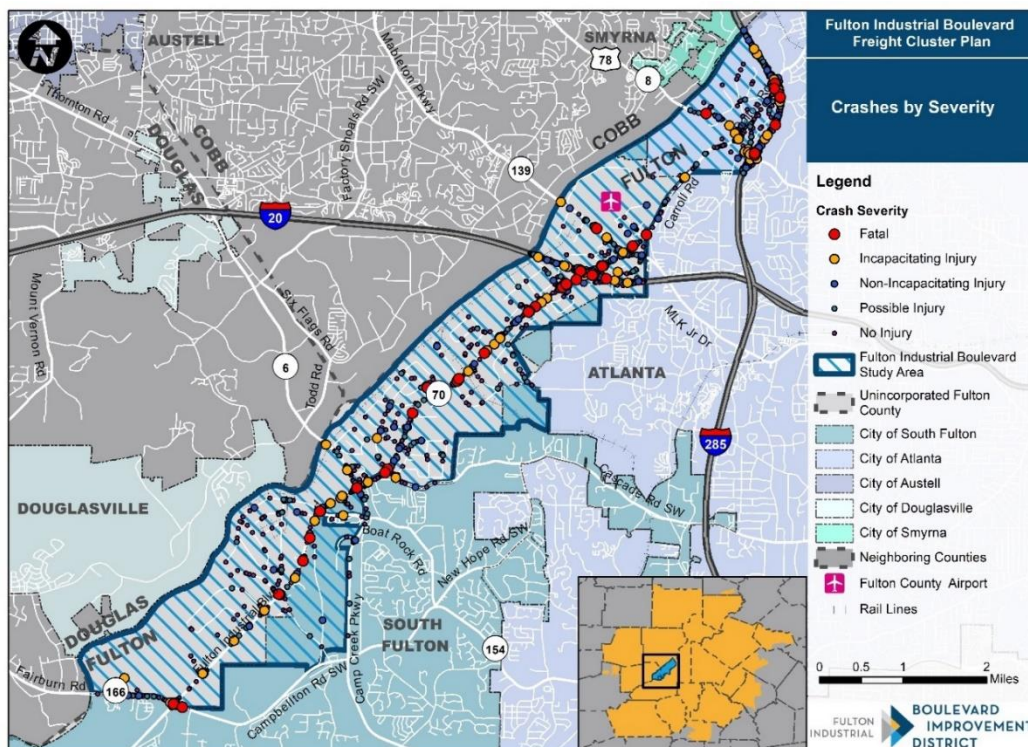
incapacitating injury crashes occurred on SR 70/Fulton Industrial Boulevard. I-285 and I-20 accounted for 21 and 9 percent of fatal and incapacitating injury crashes, respectively.

Figure 42: Crashes by Severity, 2016 to 2020



Source: GDOT, Crash Reporting Office; Consultant analysis

Figure 43: Crashes by Severity, 2016 to 2020



Source: GDOT Crash Reporting Office; Consultant analysis

For crashes involving trucks, angle, sideswipe same direction, and rear end collision types were the most prevalent as shown in Figure 44 (refer to Table 5 for descriptions of these collision types). These accounted for over 90 percent of crashes observed during the analysis period. Head on and angle collisions are the most severe crash types, accounting for approximately 2 percent and 34 percent of truck-involved crashes, respectively. The prevalence of angle crashes may be due to many factors, including excessive speed, drivers not obeying traffic signals, and poor visibility of traffic signals due to the prevalence of large trucks in the study area.¹⁷ Lane width and worn or inadequate pavement markings are typical contributing factors for sideswipe crashes.¹⁸ For rear end crashes, congestion and inappropriate approach speeds are contributing factors.¹⁹

Angle, sideswipe same direction, and rear end were also the most common collision types for crashes that did not involve trucks. They accounted for about 89 percent of crashes for all other vehicles. However, rear end was a much more prevalent collision type and sideswipe (same direction) was a much less prevalent collision type when compared to truck-involved crashes. Nearly 44 percent of crashes for all other vehicle types were rear end compared to 24 percent for truck-involved crashes. About 15 percent of crashes for all other vehicle types were sideswipe same direction, compared to 33 percent for truck-involved crashes. The differences between the physical and operational characteristics of trucks compared to passenger vehicles likely contribute to this observation. For instance, because trucks are much larger than passenger vehicles and occupy a greater share of lane width, they may be more susceptible to sideswipe crashes.

Table 5: Manner of Collision Descriptions

Manner of Collision	Description
Angle	Collision results from two or more motor vehicles traveling in directions that are perpendicular.
Rear End	Collision results from two motor vehicles traveling in the same direction.
Head-on	A collision in which the front end of one motor vehicle collides with the front end of another motor vehicle, while the two vehicles are traveling in opposite directions.
Sideswipe – Same Direction	A collision where two motor vehicles collide side to side while proceeding in the same direction.
Sideswipe – Opposite Direction	A collision where two motor vehicles collide side to side while proceeding in the opposite direction.
Not a Collision with a Motor Vehicle	A motor vehicle collision that does not involve another motor vehicle, overturning, or pedestrian.

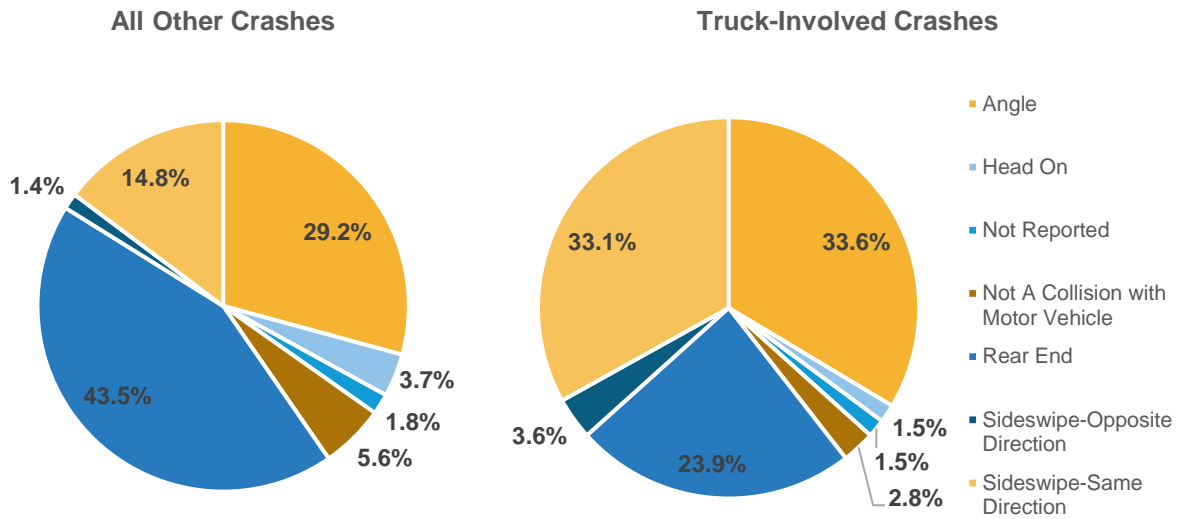
Source: Georgia Uniform Motor Vehicle Accident Report Training Manual, version 3.0, January 2018

¹⁷ American Association of State Highway and Transportation Officials (2009). *Highway Safety Manual*. Exhibit 6-4 and Exhibit 6-5, pgs. 6-6 to 6-7, 1st edition.

¹⁸ Ibid.

¹⁹ Ibid.

Figure 44: Crashes by Manner of Collision, 2016 to 2020



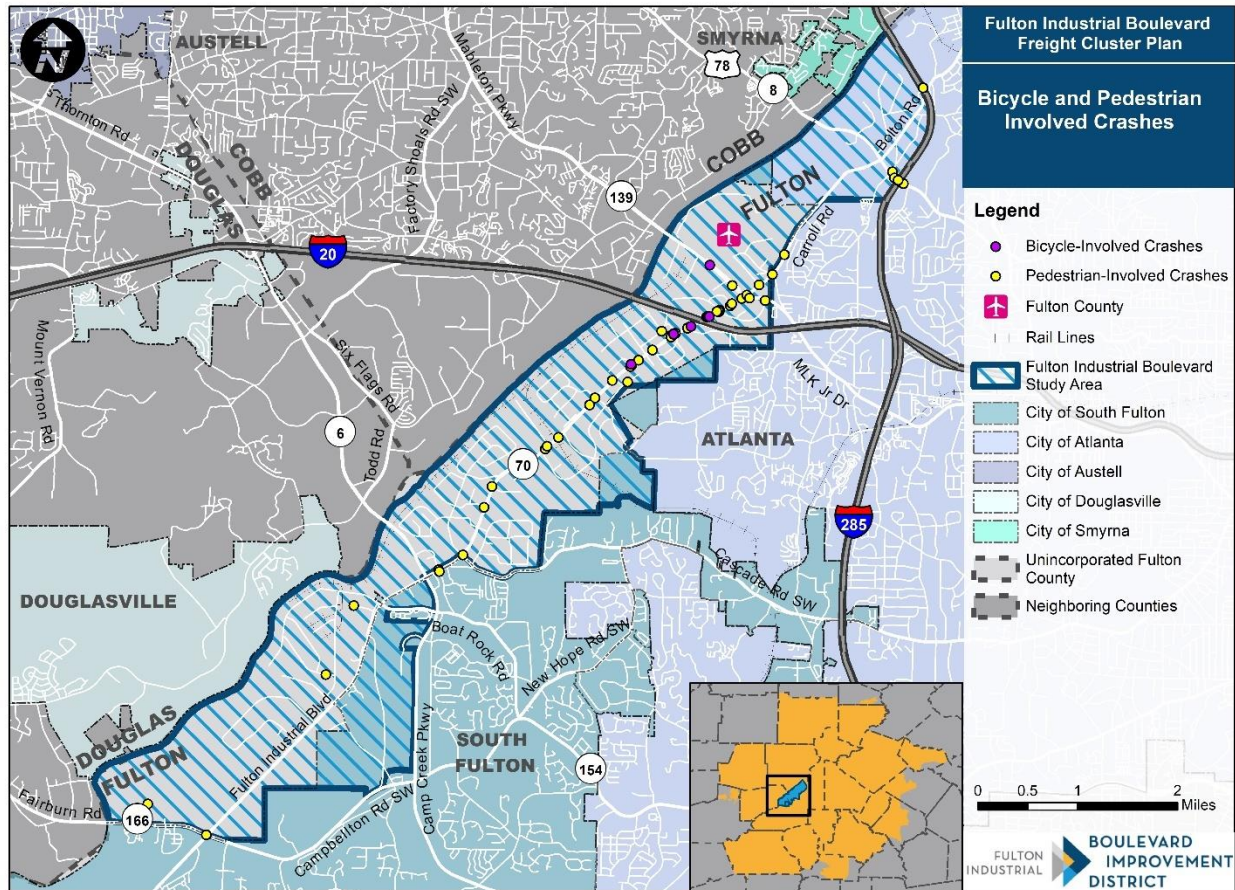
Source: GDOT, Crash Reporting Office; Consultant analysis

4.4.3 Bicycle and Pedestrian Safety

There were 5 crashes involving bicycles over the 2016-2020 analysis period (see Figure 45). None of these crashes involved a truck and none resulted in fatalities. Four of the bicycle crashes occurred on SR 70/Fulton Industrial Boulevard and 1 occurred on SR 139/Martin Luther King Jr. Drive. Those bicycle-involved crashes occurring on SR 70/Fulton Industrial Boulevard happened on the roughly 1-mile stretch between I-20 and Marvin Miller Drive. This suggests that this portion of the SR 70/Fulton Industrial Boulevard corridor should receive greater focus for improving bicycle safety.

The prevalence of bicycle crashes in this area may be driven by the presence of transit as cycling may be used to close the first-/last-mile gap between employment centers and bus stops. Bicycle crashes in this area may also be driven by the presence of numerous closely spaced driveways and the proximity of the I-20 interchange. Both of these create numerous conflict points between motorists and cyclists. Notably, 3 of the 4 bicycle crashes on SR 70/Fulton Industrial Boulevard happened at night. Additionally, 2 of the 3 bicycle crashes that occurred at night were at locations that were unlit at the time according to the crash data. This suggests that lighting improvements may enhance bicycle safety along this portion of the corridor.

Figure 45: Crashes Involving Bicycles and Pedestrians, 2016 to 2020



Source: GDOT, Crash Reporting Office; Consultant analysis

Over the analysis period, there were 58 crashes involving a pedestrian in the study area as shown in Figure 45. The majority of these crashes, over 75 percent, were located on SR 70/Fulton Industrial Boulevard. Thirteen of the pedestrian crashes resulted in a fatality. Fatal pedestrian crashes were concentrated on SR 70/Fulton Industrial Boulevard as 11 of the 13 crashes occurred on that corridor between SR 139/Martin Luther King Jr. Drive and Mendel Drive/Wharton Drive. Only 2 of the pedestrian crashes involved trucks. The truck-pedestrian crashes were not fatal but did result in injuries.

The majority of the pedestrian-involved crashes on SR 70/Fulton Industrial Boulevard (about 60 percent) occurred on the 1.75-mile stretch between SR 139/Martin Luther King Jr. Drive and Mendel Drive/Wharton Drive. Nearly all of the pedestrian crashes on SR 70/Fulton Industrial Boulevard (about 89 percent) happened on the portion between SR 6/Camp Creek Parkway and SR 139 Martin Luther King Jr. Drive. Pedestrian infrastructure (e.g., sidewalks, crosswalks) is intermittent along this portion of SR 70/Fulton Industrial Boulevard and is largely missing south of Mendel Drive/Wharton Drive (see Figure 46). Also, there are 36 MARTA bus stops on SR 70/Fulton Industrial Boulevard between SR 6/Camp Creek Parkway and SR 139 Martin Luther King Jr. Drive which contribute to pedestrian activity.

Figure 46: Mendel Drive/Wharton Drive at SR 70/Fulton Industrial Boulevard.



Source: Google Earth

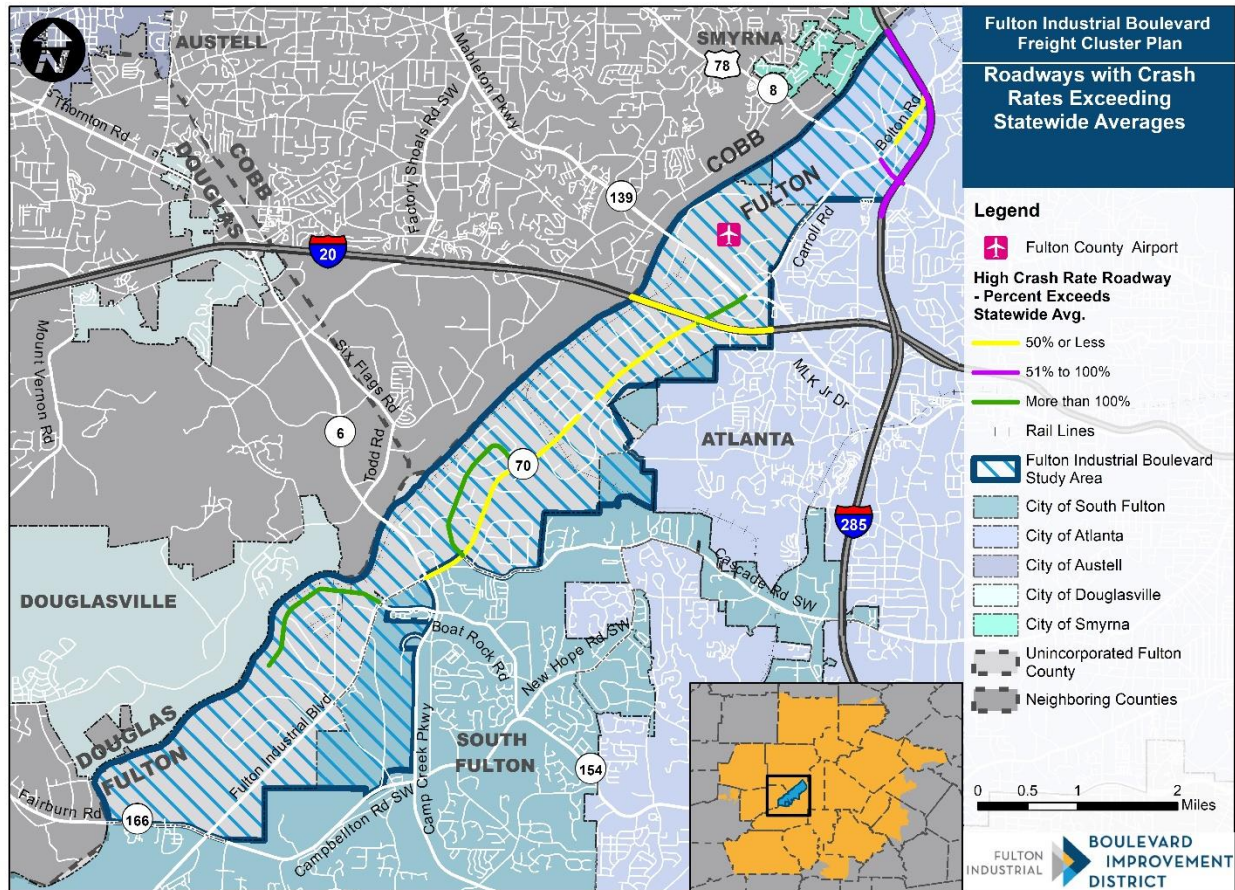
4.4.4 Crash Rates on Key Corridors

An important consideration is the crash rate for all vehicles along key corridors, as it considers the level of exposure by vehicle miles traveled (VMT)²⁰. Generally, roadways that have higher volumes are more exposed to the risk of a crash. As shown in Figure 47 and Table 6, multiple corridors in the study area have segments with crash rates that exceed statewide averages for similar roadways.²¹ For example, SR 70/Fulton Industrial Boulevard between I-20 and Mendel Drive/Wharton Drive is estimated to have a crash rate of over 800 crashes per 100 million vehicle-miles (100 MVM). This exceeds the statewide average for other minor arterials in urbanized areas, which is about 540 crashes per 100 MVM, by nearly 50 percent. Similarly, Bolton Road between I-285 and SR 70/Fulton Industrial Boulevard has a crash rate of nearly 650 crashes per 100 MVM, exceeding the rate for other minor arterials across the state by about 20 percent. Other roadways in the study area with crash rates that exceed statewide averages include I-20, I-285, Great Southwest Parkway, Boat Rock Boulevard, and SR 8/US 78/US 278/Donald L. Hollowell Parkway between SR 70/ Fulton Industrial Boulevard and I-285.

²⁰ Note that the crash rate analysis uses the annual average number of crashes and the most recent available AADT estimate from the GDOT Office of Transportation Data as provided in its “Traffic” database (<http://www.dot.ga.gov/DS/Data#tab-4>), which is maintained to meet the needs of its federally required traffic monitoring program. At the time of the analysis, 2018 was the most recent available database.

²¹ Statewide crash rates by functional class were provided by the GDOT Crash Reporting Office.

Figure 47: Crash Rates on Key Corridors that Exceed Statewide Averages



Source: GDOT Crash Reporting Office; GDOT Road & Traffic Data; Consultant analysis

Table 6: Crash Rates on Key Corridors Exceeding Statewide Averages

Functional Classification	2018 Statewide Avg. Crash Rate (Crashes per 100 MVM)	Roadway	Location	Crash Rate (Crashes per 100 MVM)
Interstate	201	I-20	CID Boundaries	265
		I-285	CID Boundaries	336
Principal Arterial (Non-Freeway)	581	SR 8/US 78/US 278/Donald L. Hollowell Pkwy.	SR 70/Fulton Industrial Blvd. to CID Boundary East	1,100
Minor Arterial	540	SR 70/Fulton Industrial Blvd.	SR 139/Martin Luther King Jr. Blvd. to I-20	1,961
			I-20 to Mendel Dr./Wharton Dr.	801
			James Aldredge Blvd. to SR 6/Camp Creek Pkwy.	710
		Bolton Road	I-285 to SR 70/Fulton Industrial Blvd.	647

Local	233	Boat Rock Blvd.	SR 70/Fulton Industrial Blvd. to western terminus	525
		Great Southwest Pkwy.	All, from northern to southern terminus	783

Source: GDOT Crash Reporting Office; GDOT Road & Traffic Data; Consultant analysis

4.4.5 Potential Contributing Factors to Safety Challenges

Detailed recommendations for addressing the CID's transportation safety challenges will be developed as part of Task 6. However, there are many factors that potentially contribute to the relatively high crash rates observed on multiple corridors throughout the CID that should be considered in the development of those recommendations. One important factor is the density of access points along these corridors in the form of driveways and intersecting roadways. Each driveway and intersecting roadway create multiple conflict points among vehicles and between vehicles with other roadway users. As several of the CID's main corridors are already median-separated, other access management solutions must be explored such as driveway consolidation and inter-parcel access.

Another potential contributing factor is roadway and intersection geometry. Sideswipe same direction crashes accounted for a significant share of total crashes over the analysis period. As previously discussed, lane width and inadequate pavement markings are typical contributing factors to this type of crash. Therefore, potential solutions to mitigate these types of crashes include widening lane widths where possible, re-striping corridors where pavement markings have become worn, and adding or replacing raised reflective pavement markers. As about 87 percent of the CID's sideswipe same direction crashes occurred on SR 70/Fulton Industrial Boulevard, I-285, and I-20, re-striping worn markings and replacing raised reflective pavement markers are likely the most relevant investments.

Visibility at intersections is another factor to consider given the prevalence of truck traffic throughout the CID. Large vehicles can limit the visibility of passenger vehicles that trail them in the traffic stream. At intersections, this can obscure a driver's visibility of a traffic signal and other vehicles which can contribute to rear end and angle collisions. To improve visibility, some agencies use side-mounted in addition to overhead traffic signals.

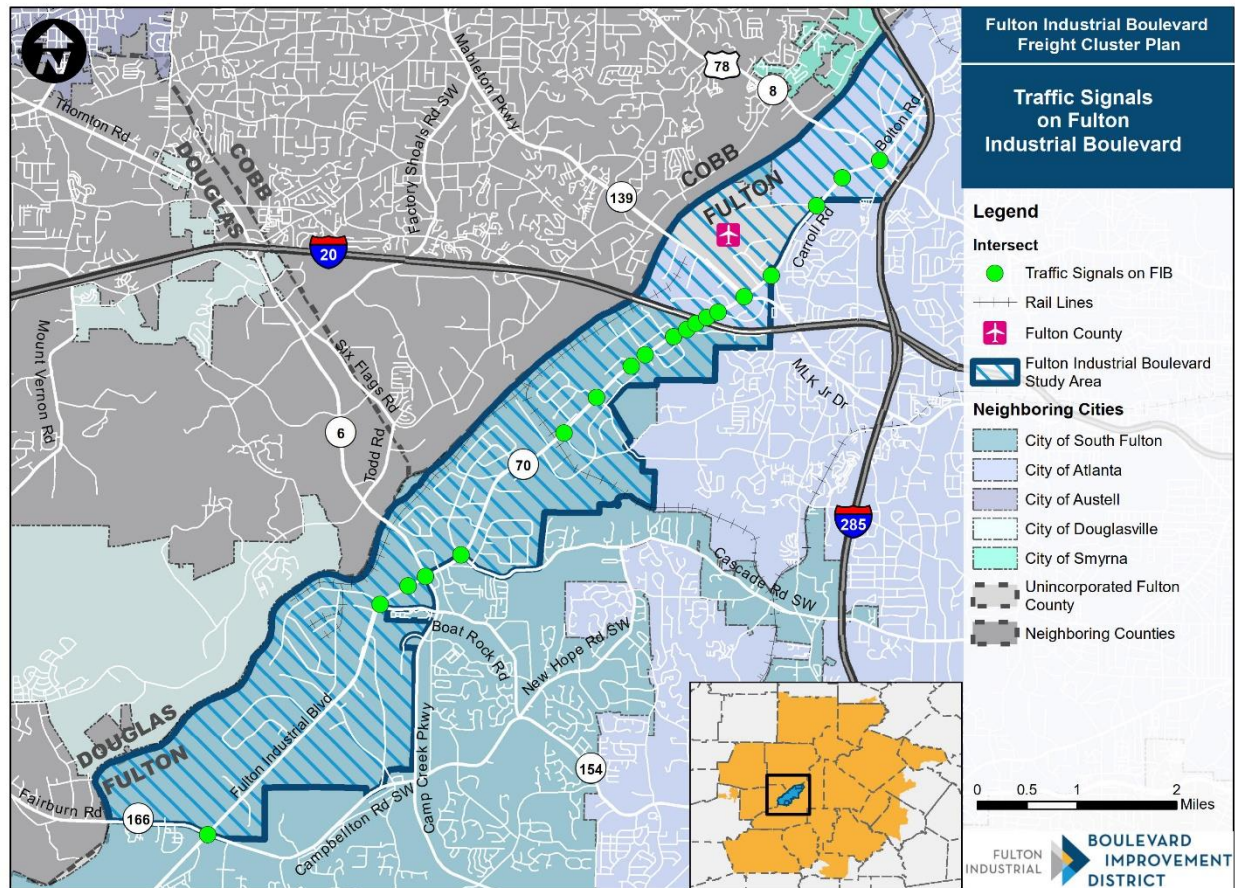
4.5 ITS and Technology

A major revolution for surface transportation in the region has begun. The future will see all modes of transportation communicating with each other and providing 360-degree awareness, while delivering a safe and seamless intelligent mobility network. This section provides an understanding and helps develop a guidance on emerging technologies for the CID. The existing Intelligent Transportation System (ITS) infrastructure was reviewed along the entire SR 70/Fulton Industrial Boulevard corridor. The project team also looked at the emergency vehicle, transit, and freight/commercial vehicle operations along with traffic incident management (TIM), work zone safety, and traveler information. Emerging mobility solutions will continue to evolve and provide the CID with opportunities to provide the right solutions to public needs.

These technologies can provide help them with safety, transit, freight/commercial vehicle, traffic incidents and traveler information.

Figure 48 shows the locations of the signals and Table 7 below lists the results of the field inventory. A 96-single mode (SM) fiber optic cable is installed along the corridor from Boat Rock Road to the UPS driveway south of SR 8/US 78/US 278/Donald L. Hollowell Parkway. The fiber looks to have breaks at Marvin Miller Drive and Commerce Drive.

Figure 48: Traffic Signals on Fulton Industrial Boulevard



Source: Consultant field observation

Table 7: ITS Signal Inventory along Fulton Industrial Boulevard

Intersection	Signal Inventory
SR 154/Campbellton Road	<ul style="list-style-type: none"> 4G Communication CCTV 2070 LX – MaxTime 332 Cabinet
Boat Rock Road	<ul style="list-style-type: none"> 4G Communication Fiber Optics – 96 SM

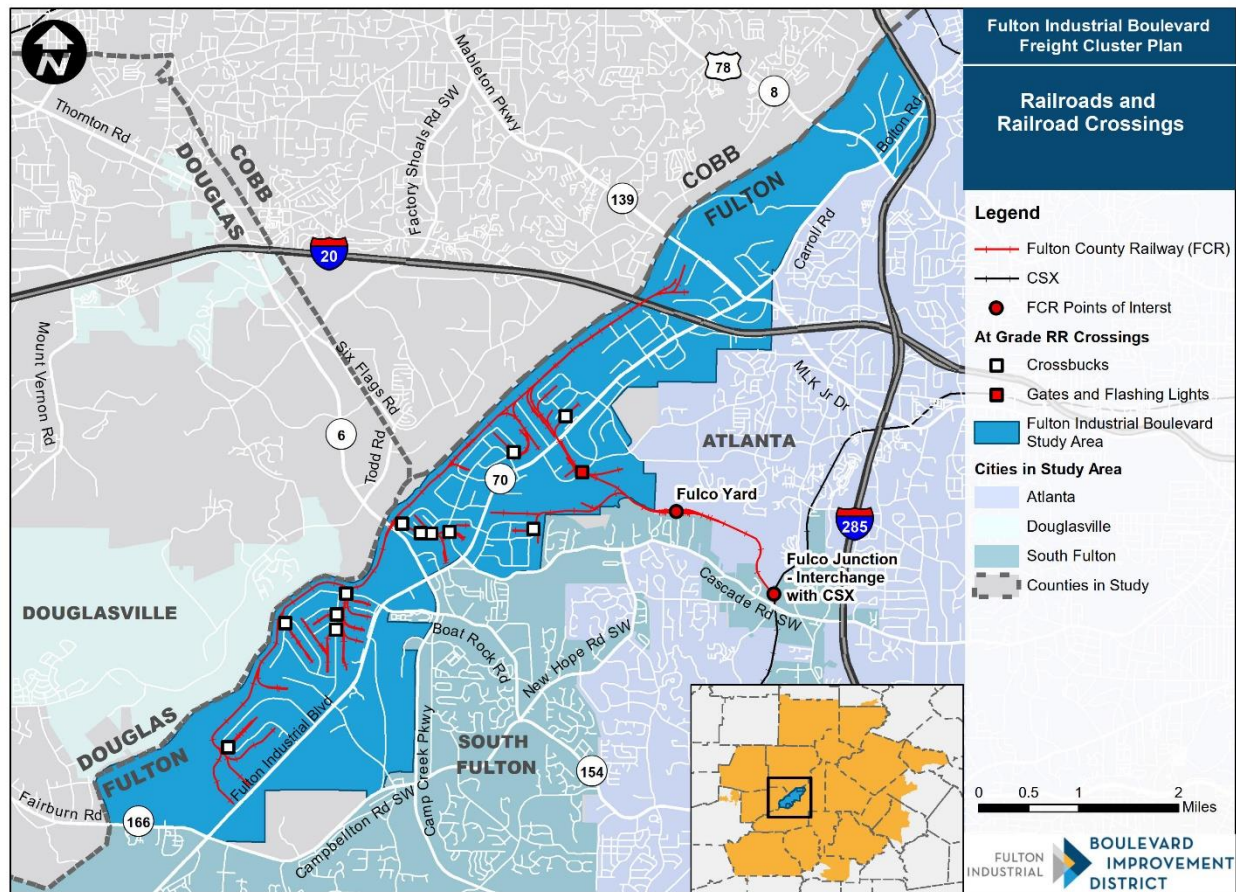
	<ul style="list-style-type: none"> • 2070 LX – MaxTime • 332 Cabinet
Lakeview Court	<ul style="list-style-type: none"> • 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • Northeast corner pedestrian pole missing
SR 6/Camp Creek Parkway	<ul style="list-style-type: none"> • 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • Roadside Unit • CCTV
Cascade Road	<ul style="list-style-type: none"> • 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • CCTV
Wharton Drive	<ul style="list-style-type: none"> • 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet
Marvin Miller Drive	<ul style="list-style-type: none"> • 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet
Patton Drive	<ul style="list-style-type: none"> • 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet
Commerce Drive	<ul style="list-style-type: none"> • 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • CCTV
Shirley Drive	<ul style="list-style-type: none"> • 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • CCTV
I-20 Eastbound	<ul style="list-style-type: none"> • 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • CCTV • Roadside Unit
I-20 Westbound	<ul style="list-style-type: none"> • 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • CCTV • Roadside Unit
Wendell Drive	<ul style="list-style-type: none"> • 4G Communication

	<ul style="list-style-type: none"> • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • Roadside Unit
SR 139/Martin Luther King Jr. Drive	<ul style="list-style-type: none"> • 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • CCTV • Roadside Unit
Aviation Circle/Old Gordon Road (Fulton County TCC)	<ul style="list-style-type: none"> • 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • Roadside Unit
Sandy Creek Road	<ul style="list-style-type: none"> • 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • Roadside Unit
UPS Driveway	<ul style="list-style-type: none"> • 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • Roadside Unit
SR 8/US 78/US 278 Donald L. Hollowell Parkway	<ul style="list-style-type: none"> • 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • CCTV • Roadside Unit

Source: Consultant field review

4.6 Rail

Figure 49 below shows the Railroad infrastructure in the Fulton Industrial Boulevard study area. The study area is served by the Fulton County Railway (FCR), a Class III railroad owned and operated by Omnitrac. FCR owns and operates 25 miles of track, including the Fulco Yard facility which lies just to the east of the study area. FCR interchanges with the class 1 railroad CSX at Fulco Junction and handles approximately 11,500 carloads per year. FCR serves over 40 customers within the study area, with chief commodities including food and beverage products, building materials, consumer goods, and paper and plastics. There are no height restrictions, bridges, or sections of track incapable of handling 286k-lb capacity railcars (Heavy-Axle Loads) on the FCR, therefore there are no issues or bottlenecks for receiving freight from class 1 railroad shipping partners.

Figure 49: Rail and Railroad Crossings*Source: Omnitrax*

There are 13 at-grade railroad crossings in the study area. All but one crossing are signed only with RR crossbucks and all crossings are limited to 10 mph rail-operation speed. The crossing of Selig Drive has both crossbucks and gates with flashing lights. The FCR is grade-separated at the three major corridors that it intersects in the study area. Fulton Industrial Boulevard, Camp Creep Parkway, and Interstate 20 all have bridges passing above the FCR.

4.7 Transit, Bicycle, and Pedestrian Connectivity

The availability of transit, bicycle, and pedestrian facilities is an important aspect of the CID, as these three modes of transportation intersect with the freight transportation network in many facets. For example, a number of freight employees utilize at least one of these methods to commute to and from their job, and pedestrian and bicyclist safety is tied closely to freight traffic, as mentioned in the Safety Analysis section. This section of the report details the characteristics of the transit, bicycle, and pedestrians throughout the CID.

4.7.1 Data Collection Process

The project team collected background data to aid the development of recommendations to improve freight movement and job access in the study area. Site specific, field data was primarily collected on-site using a tool called ArcGIS Collector, which is a mobile data collection app that integrates with ESRI software and allows geospatial data to be collected and catalogued. On-site data collection occurred on March 19, 2021 between the hours of 10:00 AM and 3:00 PM. Aerial and Street View data from Google were used to conduct quality control and supplement the on-site data collection efforts.

The following table lists each feature that was collected, how the data were recorded, and all attributes associated with each feature.

Table 8: Summary of Field Data

Feature	Types of Data	Attributes
Bus Stops	Point & Photo	Shelter present
		Bench present
		Lighting present
		Trash container present
		Lacks sidewalk connections
		Lacks safe crossing
		Lacks clear signage
Bike facility	Line & Photo	Sharrow
		Striped bike lane
		Buffered bike lane
		Protected bike lane
Sidewalks present	Line & Photo	Location
Pedestrian crossings	Point & Photo	Crosswalk
		Signalized intersection
		Pedestrian Hybrid Beacon
		2-way stop intersection
		4-way stop intersection
		Pedestrian crossing time

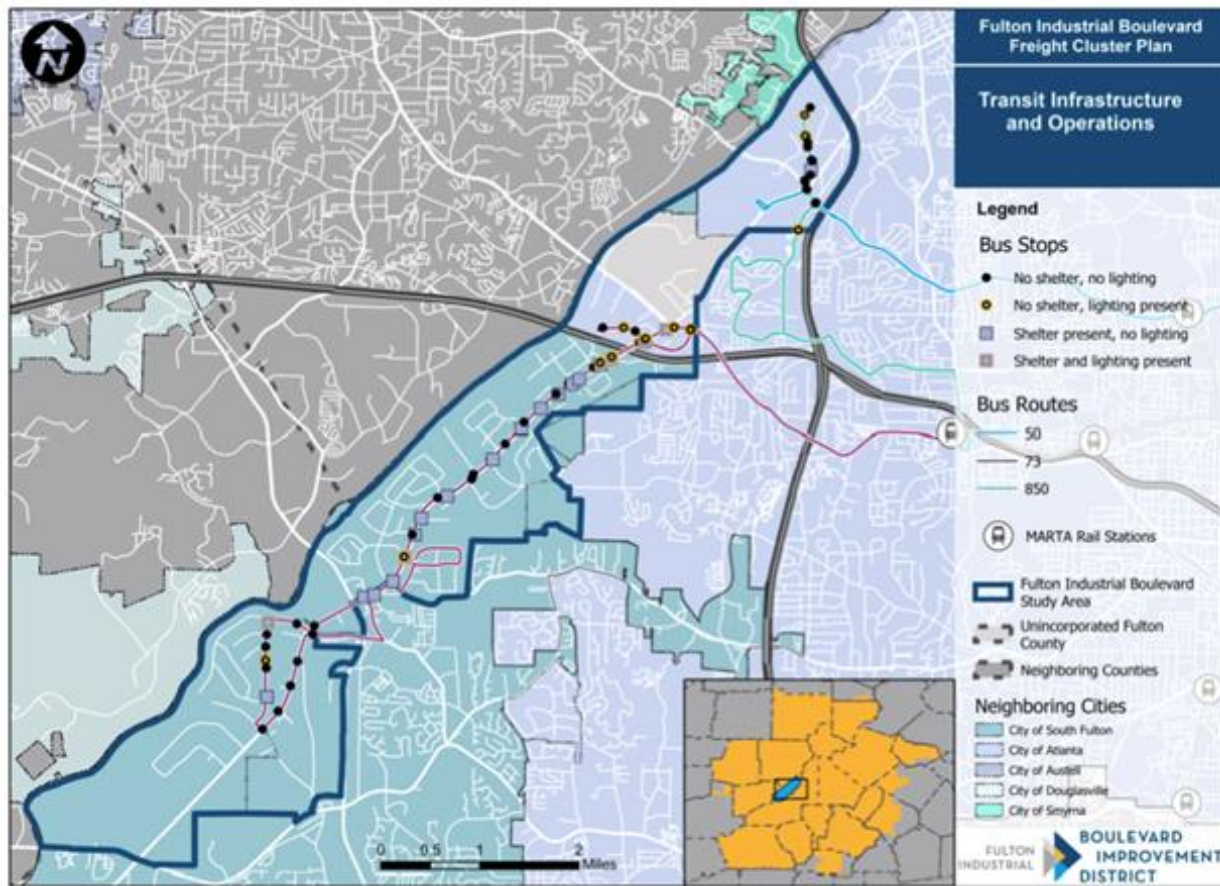
Source: Consultant analysis

In addition to the data collection efforts discussed above, the project team also reviewed publicly available transit route and frequency data, American Community Survey data, flood plain data, and information on the presence of pipelines.

4.7.2 Transit Infrastructure and Operations

There are three bus routes that provide service within the Fulton Industrial Boulevard CID. Figure 50 showcases the routes along with information on the location of bus stops and whether bus stops include shelters and/or lighting. All information in this section is based on current operations. MARTA is conducting a major review of its operations, which could result in future changes to routes and service hours in the study area.

Figure 50: Transit Infrastructure and Operations



Source: MARTA; Consultant field observation

Bus Route 73, Fulton Industrial runs east from the HE Holmes rail station to Martin Luther King Jr. Drive and then along Fulton Industrial Boulevard to Tradewater Parkway. Alternating trips run within LaGrange Boulevard and Boat Rock Boulevard at the southern end of Fulton Industrial Boulevard. Buses run from HE Holmes station from 4:40 AM to 1:20 AM on weekdays and from 5:40 AM to 1:20 AM on weekends. Buses generally run every 20 to 30 minutes.

Route 50, Donald E Hollowell Parkway runs from the UPS Distribution Center on Fulton Industrial Boulevard to the Bankhead rail station. Every hour the route extends to the North Avenue Rail Station. The route runs from 4:40 AM to 12:40 AM on weekdays and 5:30 AM to 12:00 AM on weekends. Buses generally run every 20 to 30 minutes.

Route 850, Carroll Heights/Fairburn Heights runs from Atlanta Industrial Park along Atlanta Industrial Parkway, connects to Route 50 at Donald Lee Hollowell Parkway, and then serves the study area generally via Bolton Road and Collier Drive before connecting to the HE Holmes rail station via HE Holmes Drive. The route runs from 5:15 AM to 12:00 AM on weekdays and weekends. Buses generally run every 55 to 65 minutes.

No bus service runs south of Tradewater Parkway.

The project team identified 80 bus stops in the study area and tracked the features of each. On average, stops are spaced approximately 0.25 miles apart. Of the 80 bus stops,

- 20 (25%) have shelters;
- 25 (31%) have benches;
- 17 (21%) have lighting;
- 22 (28%) have sidewalk connections;
- 10 (13%) have safe pedestrian crossings;
- 70 (88%) have clear signage; and
- 27 (34%) have trash receptacles.

No bus stops have all seven features. Six bus stops have six of the features listed above. Figure 51, a shelter at the corner of Fulton Industrial Boulevard and Westgate Drive, is an example of a typical shelter in the study area. It includes four of the seven features we tracked: A shelter, bench, trash container, and clear signage. It does not have lighting, sidewalk connections, or a safe street crossing.

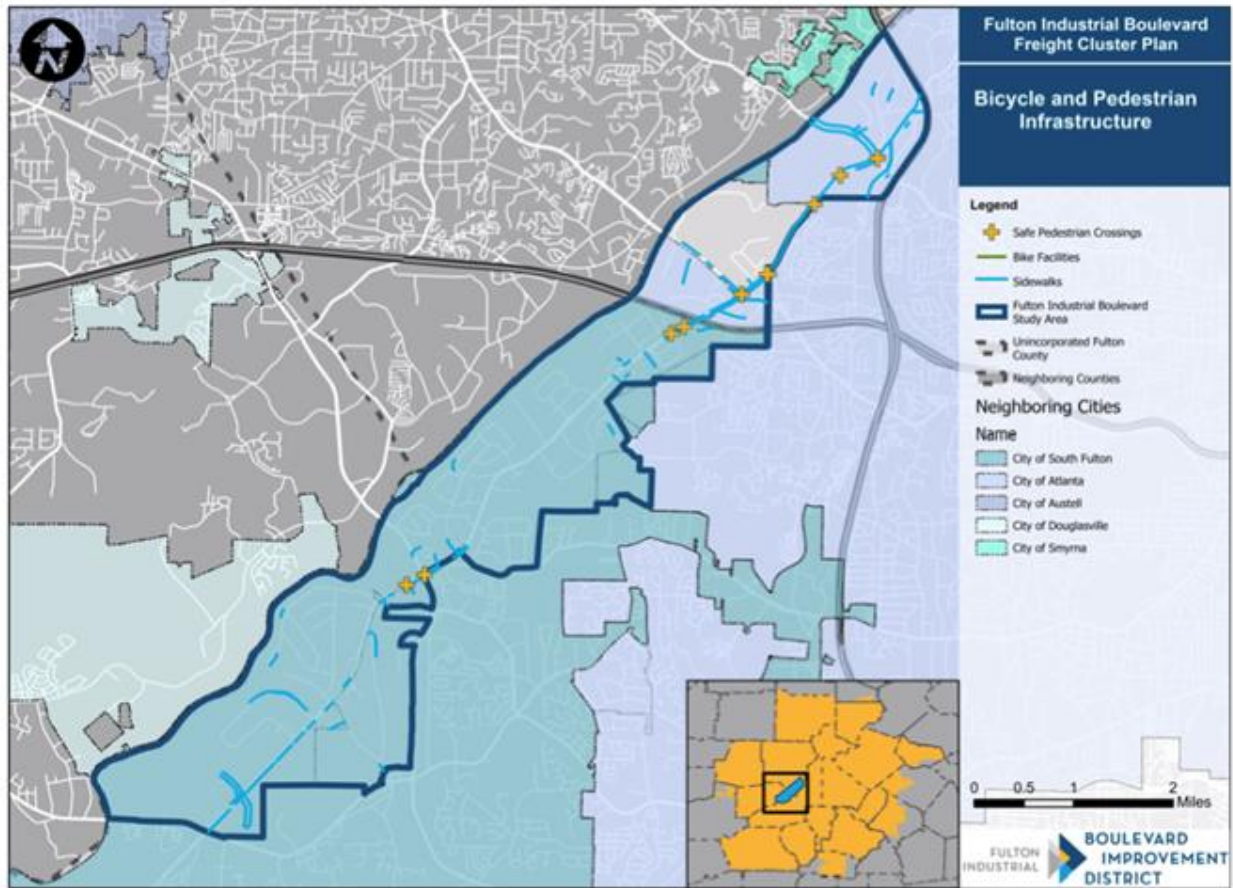
Figure 51: Bus Stop 900696



Source: Consultant field observation

4.7.3 Bicycle and Pedestrian Infrastructure

Bicycle infrastructure is not present in the study area and sidewalk availability is varied along Fulton Industrial Boulevard, which has nine signalized pedestrian crossings with crosswalks and average allowed crossing times of 34 seconds. Figure 52 shows the location of the signalized pedestrian crossing and where sidewalks are present.

Figure 52: Bicycle and Pedestrian Infrastructure*Consultant field observation*

There are generally no sidewalks on cross and adjacent streets to Fulton Industrial Boulevard. Most of the street networks connected by Lagrange Boulevard SW and Great Southwest Parkway SW have wide shoulders where people can walk and bike. However, there is limited lighting at night, and lighting is not guaranteed at many of the bus stops, as shown in Figure 50. Walking paths are common along sections of Fulton Industrial Boulevard that lack sidewalks indicating demand for pedestrian travel in areas without sidewalks.

4.8 Transportation Demand Management and Job Access

Transportation demand management (TDM) is a collection of strategies that shift the how, when, and where of people's travel to increase transportation system efficiency, reduce single occupancy vehicle (SOV) travel, improve air quality, and increase mobility for people who do not own a vehicle or have limited access to a vehicle. TDM has the potential to improve employee access to job opportunities within the Fulton Industrial Boulevard Improvement District, reduce employee vehicle trips, and help attract more employees.

Georgia Commute Options assists Atlanta region employers with the development and implementation of TDM programs. Currently there are no official Georgia Commute Options partners in the Fulton Industrial Boulevard area. However, this planning process offers an opportunity to determine the specific transportation needs of Fulton Industrial Boulevard employers and identify both infrastructure and TDM strategies that can meet those needs to improve employee job access and decrease the number of vehicle trips that employees make into the study area.

There are several organizations providing workforce development initiatives within the Atlanta region, including job access assistance. The Atlanta Regional Commission's Workforce Solutions Division manages WorkSource Atlanta Regional, which helps employers find talent and provides training for both new and existing employees. While transportation is not a specific service offering, it is one of the largest barriers to job placement. This study may offer an opportunity to connect TDM strategies and workforce development activities.

To identify effective TDM strategies, it is important to understand where employees work, where they are traveling from, how they travel to work, and what travel options may make most sense for them.

Employee work location data was obtained from Reference USA, which reports the location of employers and the number of employees at employment sites. It uses data from the White Pages, Securities and Exchange Commission, US Postal Service, and US Census. Table 9 summarizes the Reference USA data and shows the number of employers within the study area and the associated number of employees at each employer.

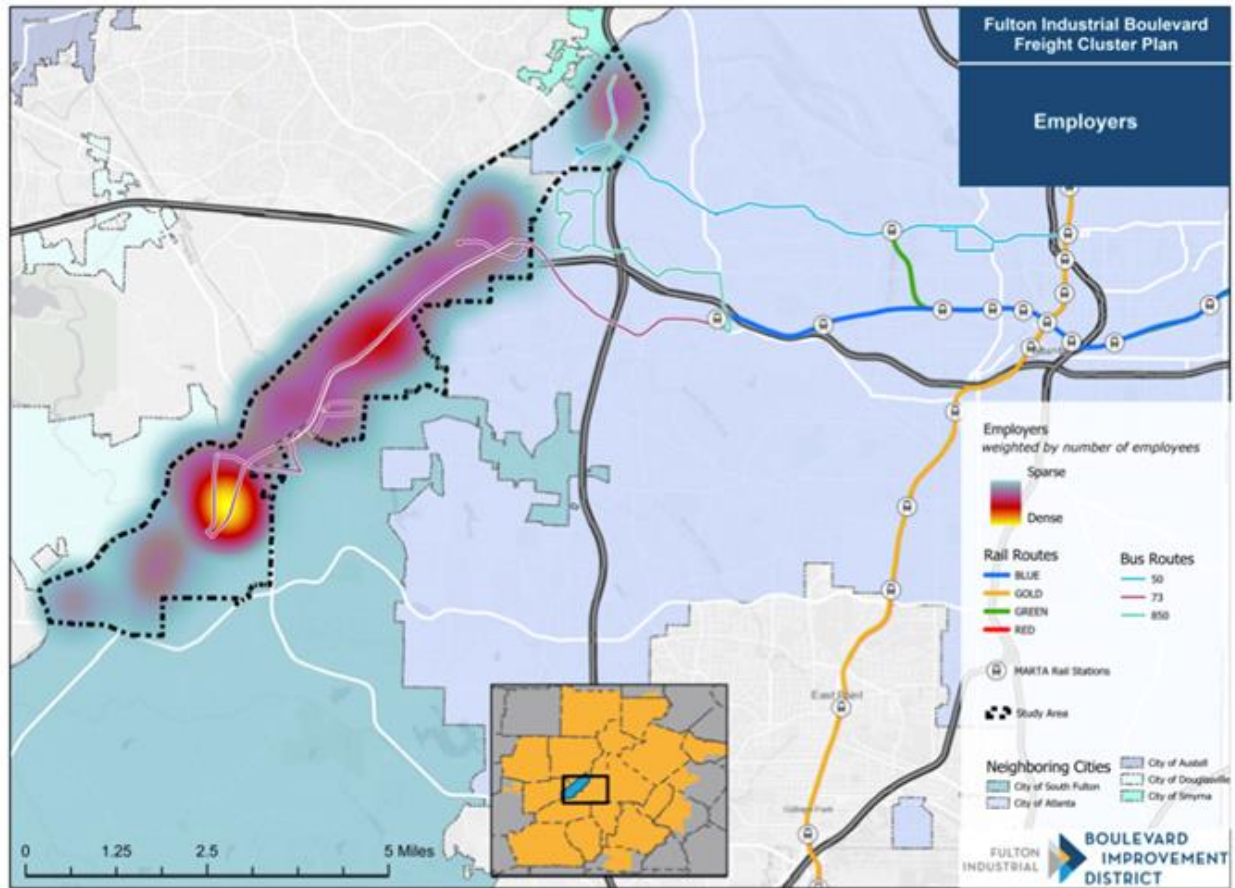
Table 9: Employer and Employee Count

Employee Count	Number of Employers
1-4	302
5-19	407
20-49	134
50-99	40
100-499	40
500-700	3

Source: Reference USA

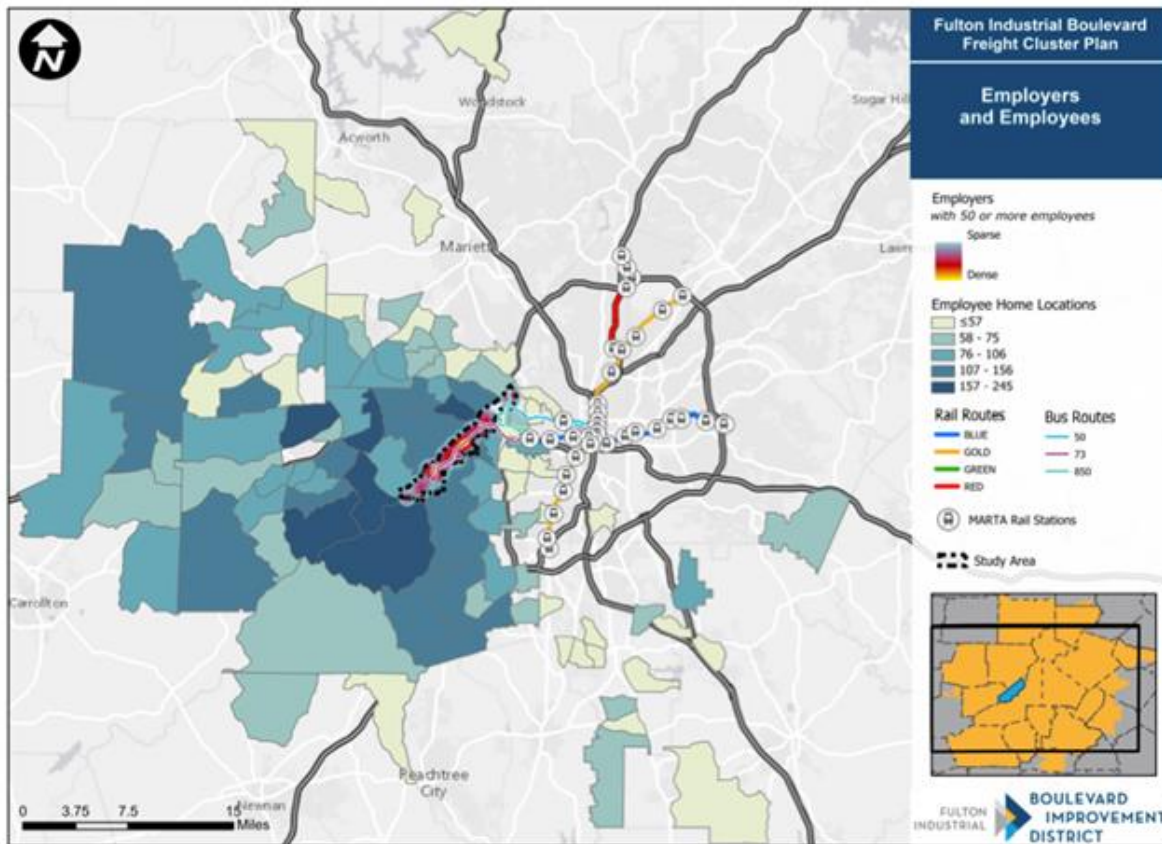
Figure 53 is a map that shows the density of employment within the study area (using the same Reference USA data) versus available transit service. The map shows a large geographic area that includes MARTA's rail lines because some employees may choose to ride rail service to connect to local transit routes. The map shows that the local transit routes serve the densest employment areas.

Figure 53: Employment Density Versus Available Transit



Source: Reference USA

Figure 54 shows the same information but adds another layer that shows where employees live. The employee home location data was gathered using OnTheMap, a product of the US Census Bureau's Longitudinal Employer-Household Dynamics program. While Figure 53 shows that employment sites are well served by local bus service, the addition of home location data in Figure 53 shows that most employees do not live where they can access transit service. This indicates that transit service and non-transit investments may be necessary to better connect employees with jobs.

Figure 54: Job Access Via Transit

Source: Reference USA; OnTheMap

Table 10 shows the mode split of employees in the study area. Data for this table came from the Census Transportation Planning Products Program, which produces special tabulations of American Community Survey data. Carpooling and transit rates in the study area are almost identical to the regional averages of 11% and 3% respectively. The drive alone rate in the study area is 83%, which is higher than the regional average of 78%. The variation is due almost entirely to the lack of employees working from home.

Table 10: Employee Commute Modes

Mode	Number of Commuters	Percent of Commuters
Drive alone	9,695	83%
Carpool	1,250	10%
Bus	320	3%
Bicycle	4	0%
Walk	15	0%
Other Mode	165	1%
Worked at home	105	1%

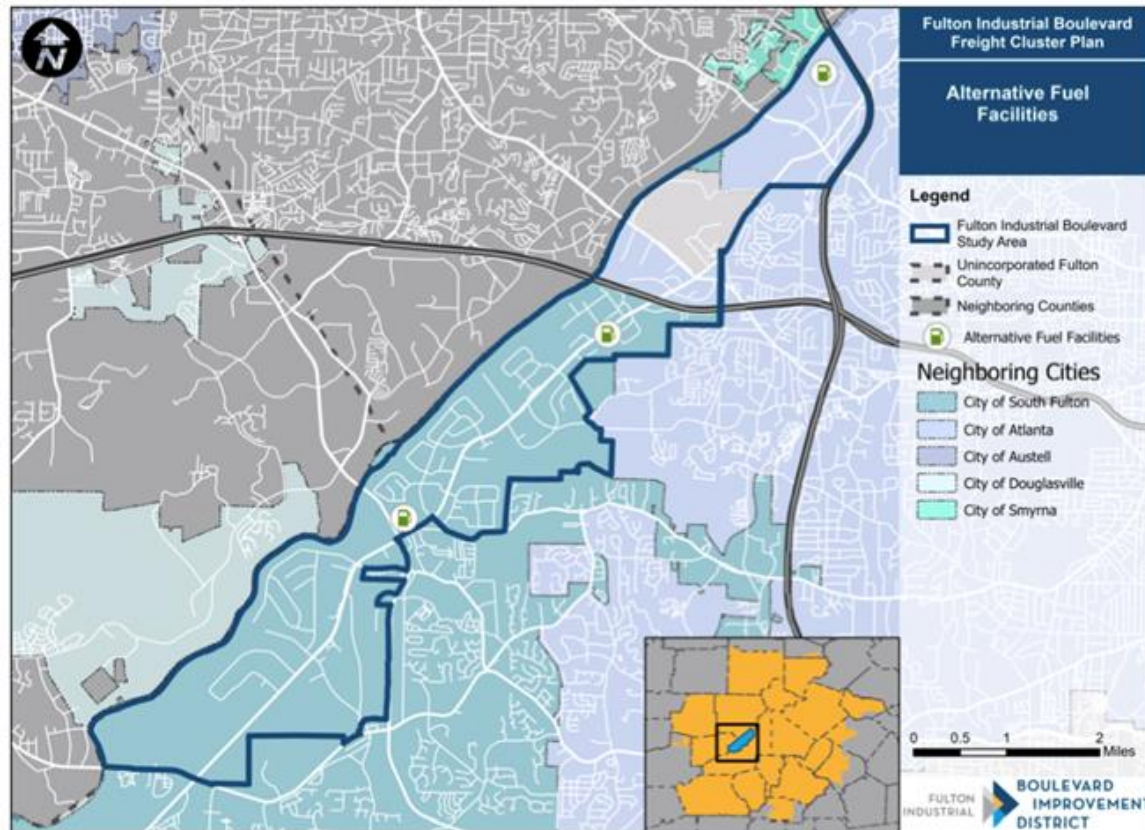
Source: Census Transportation Planning Products Program (CTPP)

4.9 Other Transportation Assets

4.9.1 Alternative Fuel Facilities

The project team identified three publicly available alternative fuel facilities along Fulton Industrial Boulevard, and they are shown in Figure 55. The facilities included electric vehicle charging and compressed natural gas facilities. Photographs of the facilities are provided in Figure 56 to Figure 58.

Figure 55: Alternative Fuel Facilities



Source: Consultant field observation

At the north end of the study area, on Atlanta Industrial Parkway, there is a publicly available passenger vehicle charging station with two chargers. It is unclear whether these chargers are functioning.

Figure 56: Passenger EV Charging Station

Source: Consultant field observation

On Patton Drive, at a Shell gas station, there are three TrilliumCNG natural gas pumps available.

Figure 57: TrilliumCNG Pump

Source: Consultant field observation

On Bakers Ferry Road, at the Thornton Road intersection, there are five natural gas pumps available at the Clean Energy station. This location is also a truck stop.

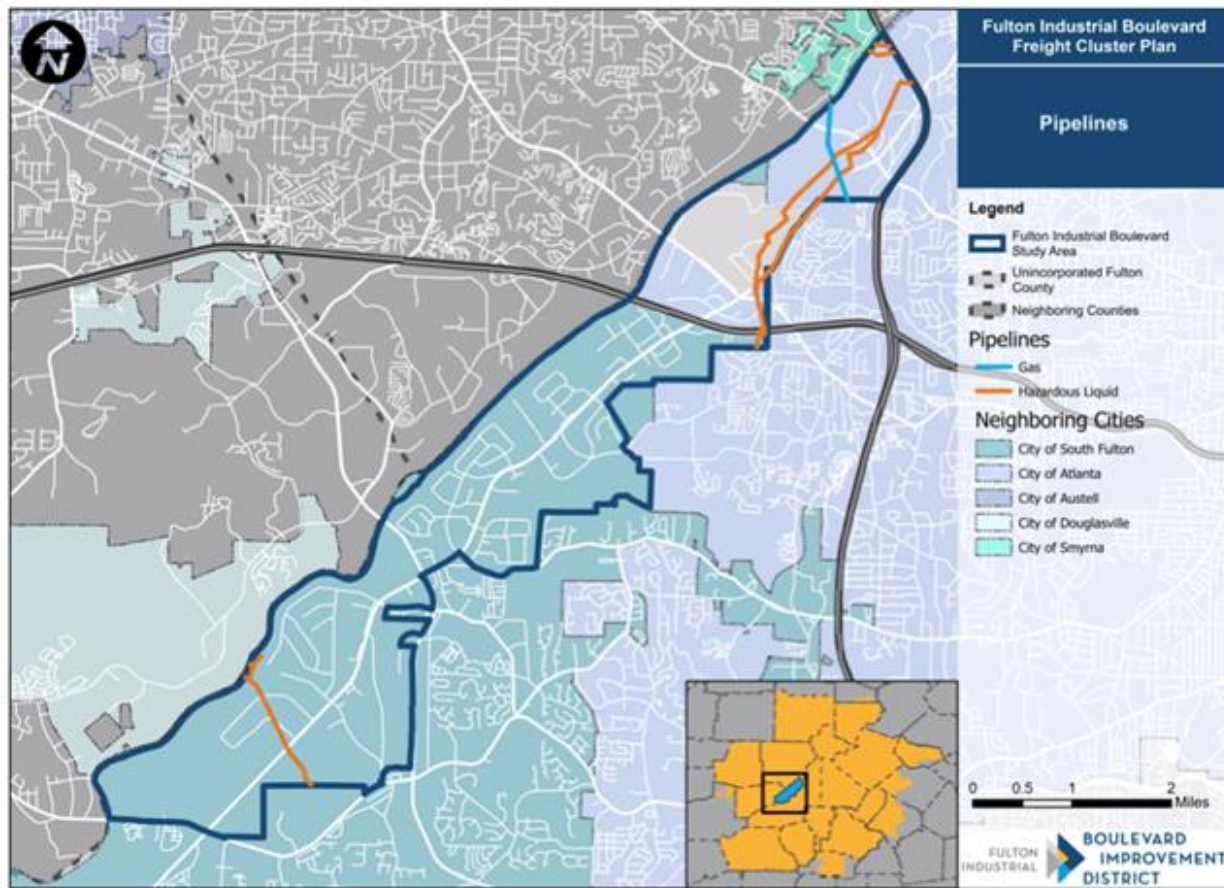
Figure 58: Clean Energy CNG Pumps



Source: Consultant field observation

4.9.2 Pipelines

Gas and hazardous liquid pipelines are shown in Figure 59. The data came from the National Pipeline Mapping System (NPMS), which is under the jurisdiction of the Pipeline and Hazardous Materials Safety Administration (PHMSA). The map does not contain gas gathering or distribution pipelines. This map represents the best available data. The map should not be assumed to represent all pipelines that run through the study area.

Figure 59: Pipelines

Source: National Pipeline Mapping System

4.10 Land Use and Zoning

Transportation has a strong relationship with the current land use and development patterns in an area. Additional roadway and transit capacity may be necessary to support an influx of new homes, while greater turning radii may be necessary to accommodate trucks maneuvering intersections to access a nearby distribution center. Likewise, these transportation investments spur new development and redevelopment as companies and communities take advantage of improved accessibility and new capacity. This report describes the current land uses within the CID study area and examines potential future land uses. It also discusses the implications of current and future land use decisions on the CID's transportation system, highlighting instances where conflicts may arise between freight-intensive and non-freight-intensive land uses so that they may be addressed through future infrastructure, policy, and programmatic solutions.

The majority of land within the CID is industrial and is predominantly surrounded by single-family residential land uses. This implies that while there are few incompatible land uses within the CID (e.g., a residential development surrounded by industrial parcels), incompatible land uses do exist at the CID's boundaries. This can create challenges in the form of freight and non-freight vehicle conflicts along the study area's

main corridors, such as SR 70/Fulton Industrial Boulevard. Furthermore, the long-term vision for future land use may create additional conflicts at certain locations unless steps are taken to mitigate them. This can be seen primarily in the form of high-density commercial and/or mixed-use future land uses near Bolton Road and SR 8/US 78/US 278/Donald L. Hollowell Parkway at the northern boundary of the CID.

4.10.1 Existing Land Uses

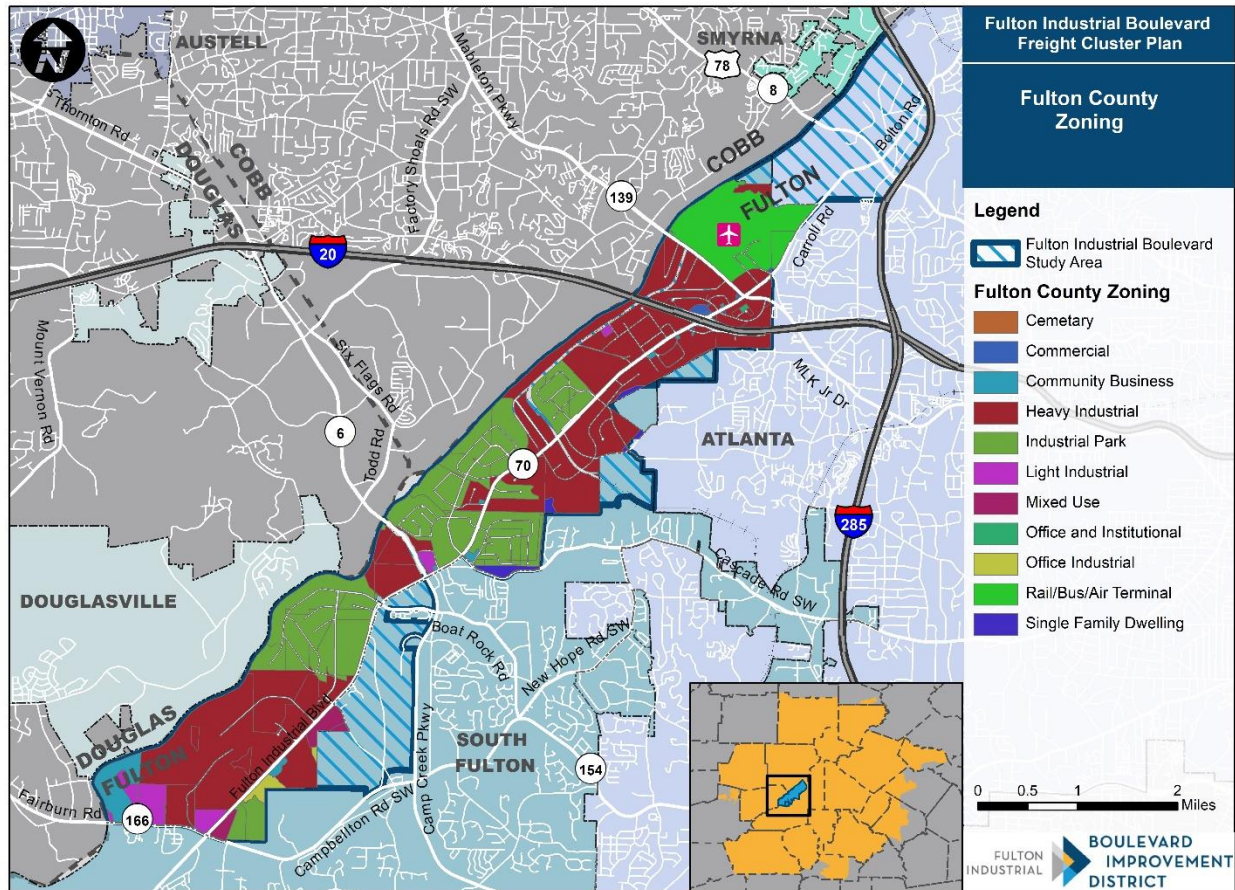
The analysis of existing land uses primarily relies on data collected as part of the comprehensive plans for Fulton County and the City of Atlanta. Comprehensive plans are long-term documents that provide a vision for the future and help to guide the growth of a community. With the passage and signing by the Governor of House Bill 445, the CID is primarily within the City of South Fulton with the portion north of I-20 in the City of Atlanta and Fulton County Airport remaining in unincorporated Fulton County²². The City of South Fulton is in the process of developing its first comprehensive plan; it currently relies on the 2035 Fulton County Comprehensive Plan developed in 2016. The comprehensive plans of neighboring jurisdictions (e.g., Cobb County and Douglas County) were also examined to understand their potential impacts on the CID. Where available, the existing land use analysis uses a jurisdiction's designated character areas or other classifications that characterize the common form of development and land use patterns. Zoning data is used when this data is not available.

As shown in Figure 60²³, the existing land use in the CID is predominantly industrial or heavy industrial. Many of the CID's industrial properties are used for warehousing and distribution centers. Despite many of the CID's industrial properties being older developments not well-suited for modern logistics needs, feedback from stakeholders indicate that these properties are being renovated for those purposes due to the CID's desirable location near multiple regional centers (e.g., Downtown Atlanta, Cumberland). Much of the CID's commercial development is clustered around the I-20 interchange with SR 70/Fulton Industrial Boulevard.

²² Brasch, B. "South Fulton gets Fulton Industrial, spells end for unincorporated land," Atlanta Journal-Constitution, May 13, 2021, <https://www.ajc.com/news/atlanta-news/south-fulton-gets-fulton-industrial-spells-end-for-unincorporated-land/B7QHR2JLZZAJXF67VIOVS762OQ/>.

²³ Note that Fulton County Airport is zoned as Single Family Dwelling, but Figure 1 depicts the actual land use.

Figure 60: Fulton County Zoning



Source: Fulton County, Department of Public Works

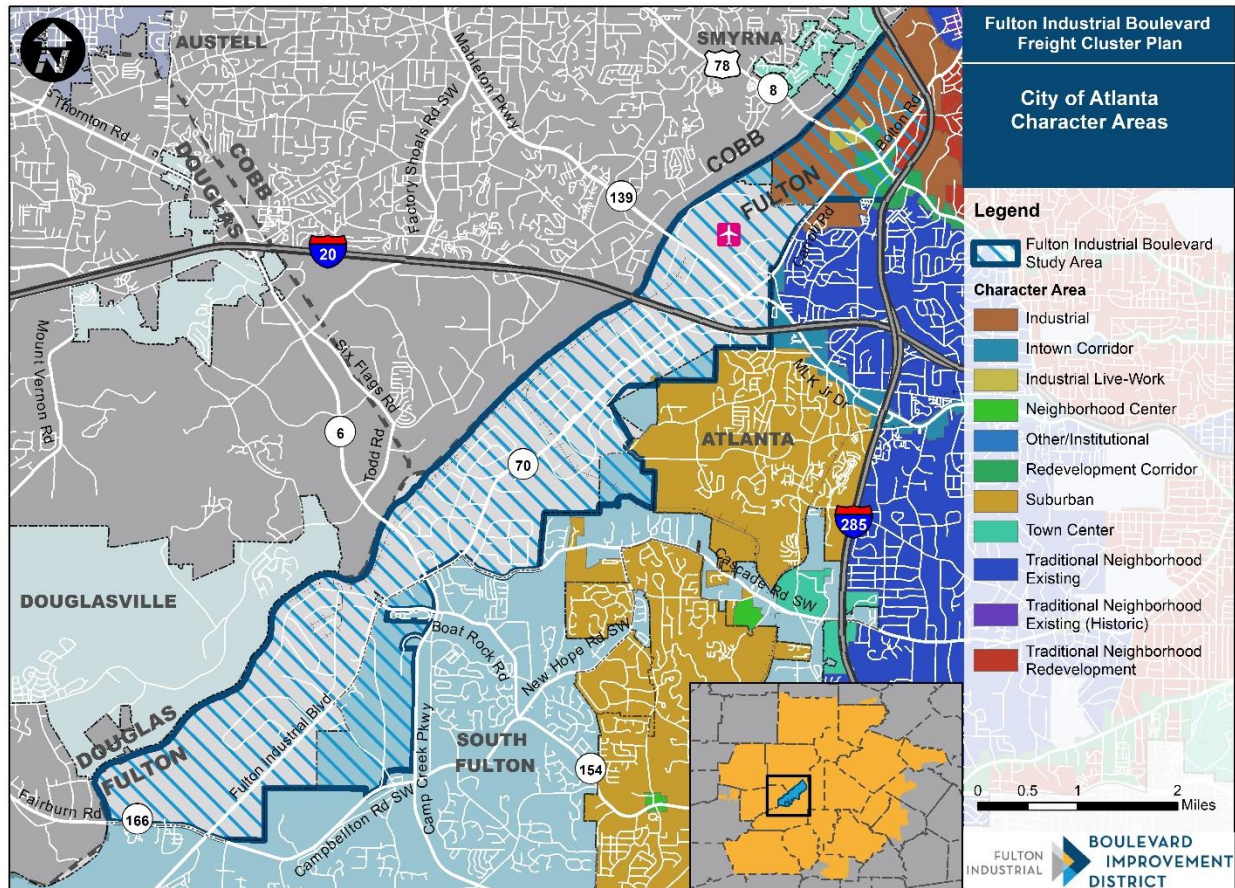
Note: Fulton County Airport is zoned as Single-Family Dwelling, but the actual land use is shown in this map.

Land use in the CID consists almost exclusively of industrial and heavy industrial with limited commercial, and community business. This limits the potential for conflicting or incompatible land uses. The largest concentration of residential land use within the CID is clustered at the northern boundary. The English Park neighborhood of the City of Atlanta is roughly bounded by I-285, Bolton Road, and SR 8/US 78/US 278/Donald L. Hollowell Parkway. The neighborhood primarily consists of detached, single-family residences and is surrounded by industrial or commercial land uses (see Figure 61). Along the CID's eastern boundary, single- and multi-family residential are the predominant land uses with the multi-family portion being concentrated near the intersection of SR 70/Fulton Industrial Boulevard and SR 8/US 78/US 278/Donald L. Hollowell Parkway.

A similar pattern of single-family land use bordering the CID was observed for the City of South Fulton as shown in Figure 62. Towards the southern end of the CID along SR 154/Campbellton Road, large parcels of land bordering the CID are zoned for single-family residential. The same is true of other major corridors that serve as boundaries for the CID, including SR 6/Camp Creek Parkway and Cascade Road. While there

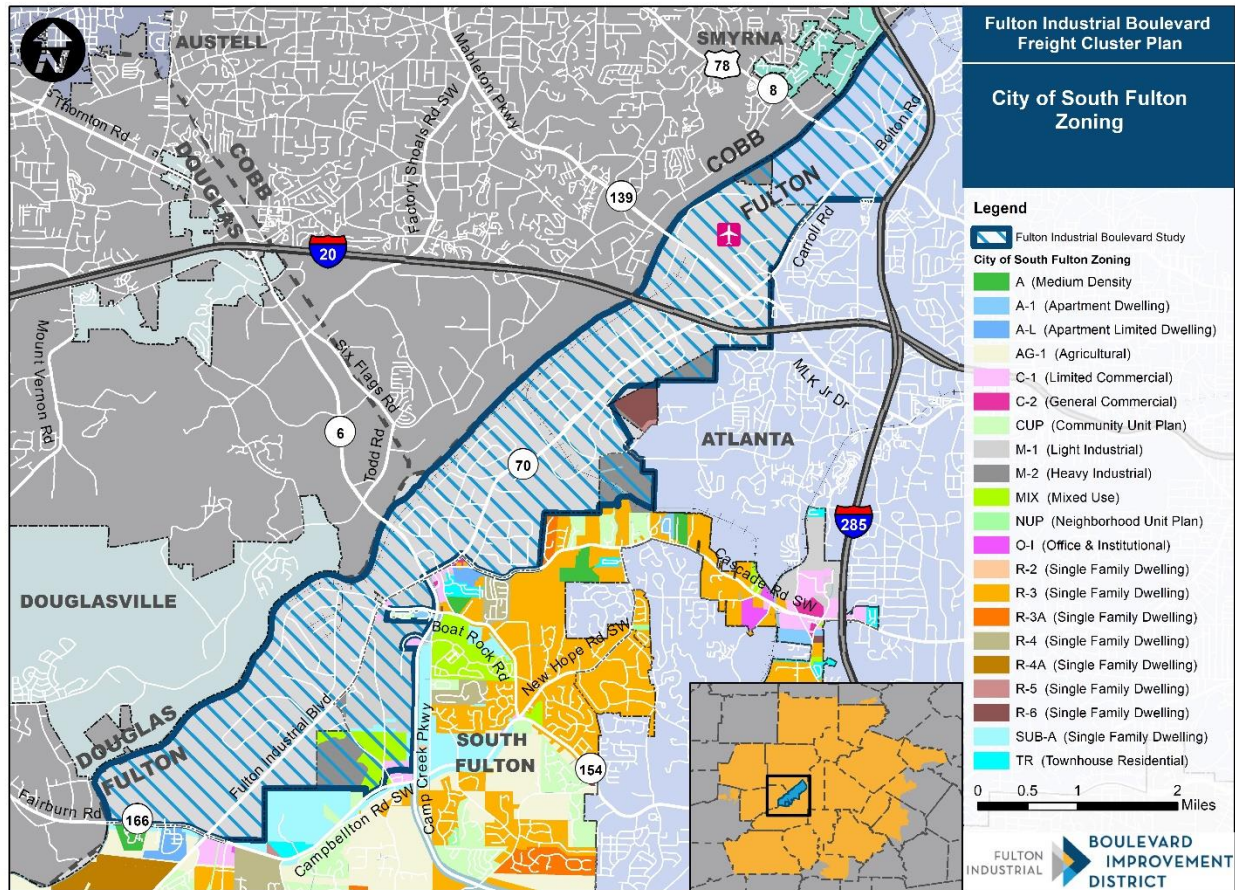
are very few incompatible land uses within the CID, they do exist at its boundaries. This creates conflicts between freight and non-freight vehicles as commuters traverse freight-intensive tracts of land to access residential communities from the study area's main corridors (e.g., SR 70/Fulton Industrial Boulevard, SR 6/Camp Creek Parkway, Cascade Road, etc.).

Figure 61: City of Atlanta Character Areas



Source: City of Atlanta, Office of Zoning and Development

Figure 62: City of South Fulton Zoning



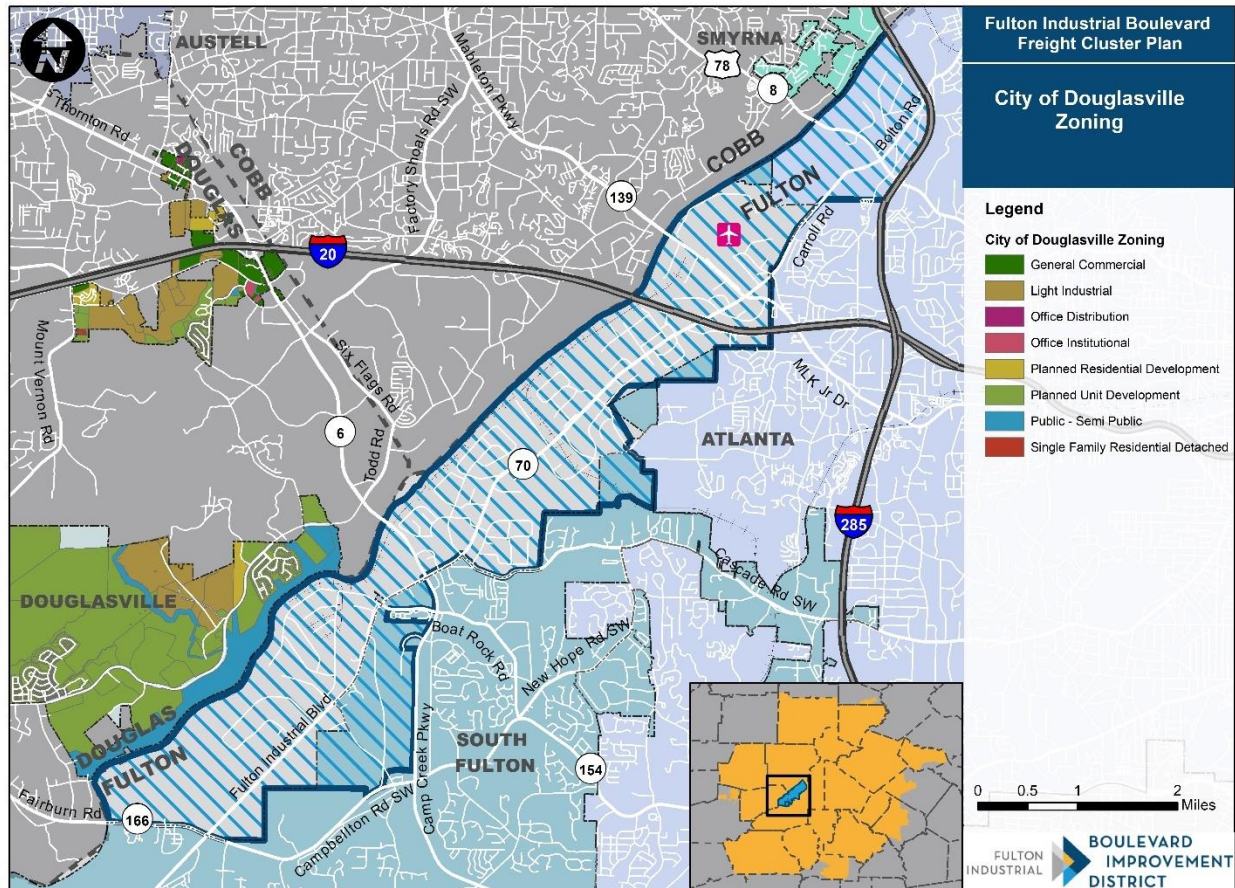
Source: City of South Fulton, Open GIS Site

The existing land uses in neighboring jurisdictions were also examined, including the City of Douglasville, Douglas County, and Cobb County. Though outside of the study area, the land use decisions made in these communities have the ability to impact traffic patterns and development activity within the CID as they share key corridors including SR 6/Camp Creek Parkway, SR 139/Martin Luther King Jr. Drive, SR 154/Campbellton Road, and SR 8/US 78/US 278/Donald L. Hollowell Parkway. A relatively small portion of unincorporated Douglas County borders the CID along SR 6/Camp Creek Parkway and like most of the CID has industrial land uses. As shown in Figure 63, much of the land in the portion of the City of Douglasville that borders the CID is zoned as either public land or planned unit development (PUD). The PUD zoning classification is intended to encourage the best possible site plans and building arrangements under a unified plan of development, rather than under lot-by-lot regulation.²⁴ Generally, this allows for mixed-use development.

²⁴ Code of Ordinances of the City of Douglasville, Appendix A, Section 4.03.

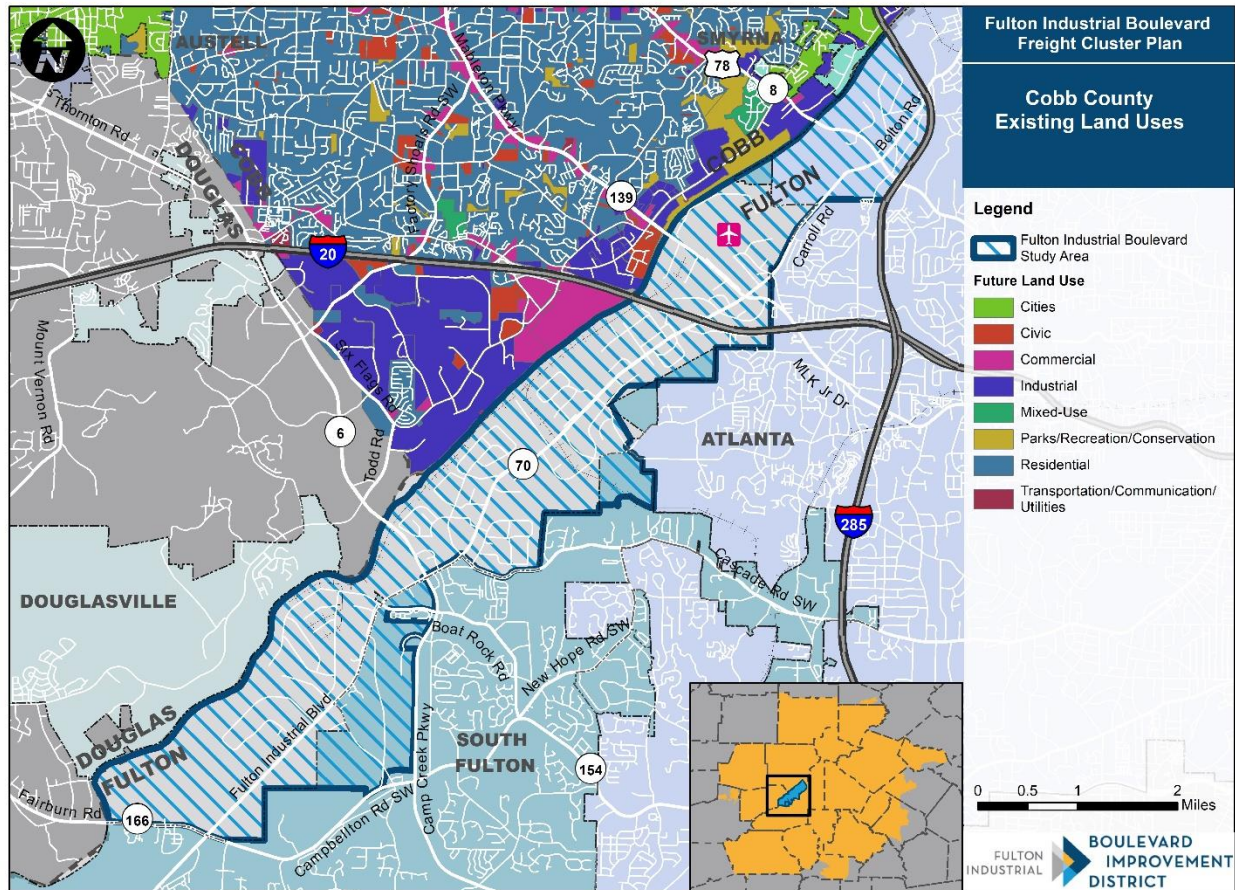
For the portion of Cobb County that borders the CID, existing land uses are largely industrial (see Figure 64). This is primarily the case for the unincorporated area of Cobb County bounded by I-20, the Chattahoochee River, and the Cobb-Douglas County line. Industrial land uses are also present in Cobb County north of I-20 along the Chattahoochee River, but residential land uses also become more prevalent.

Figure 63: City of Douglasville Zoning



Source: Douglas County Planning and Zoning Department; Consultant analysis

Figure 64: Cobb County Existing Land Uses



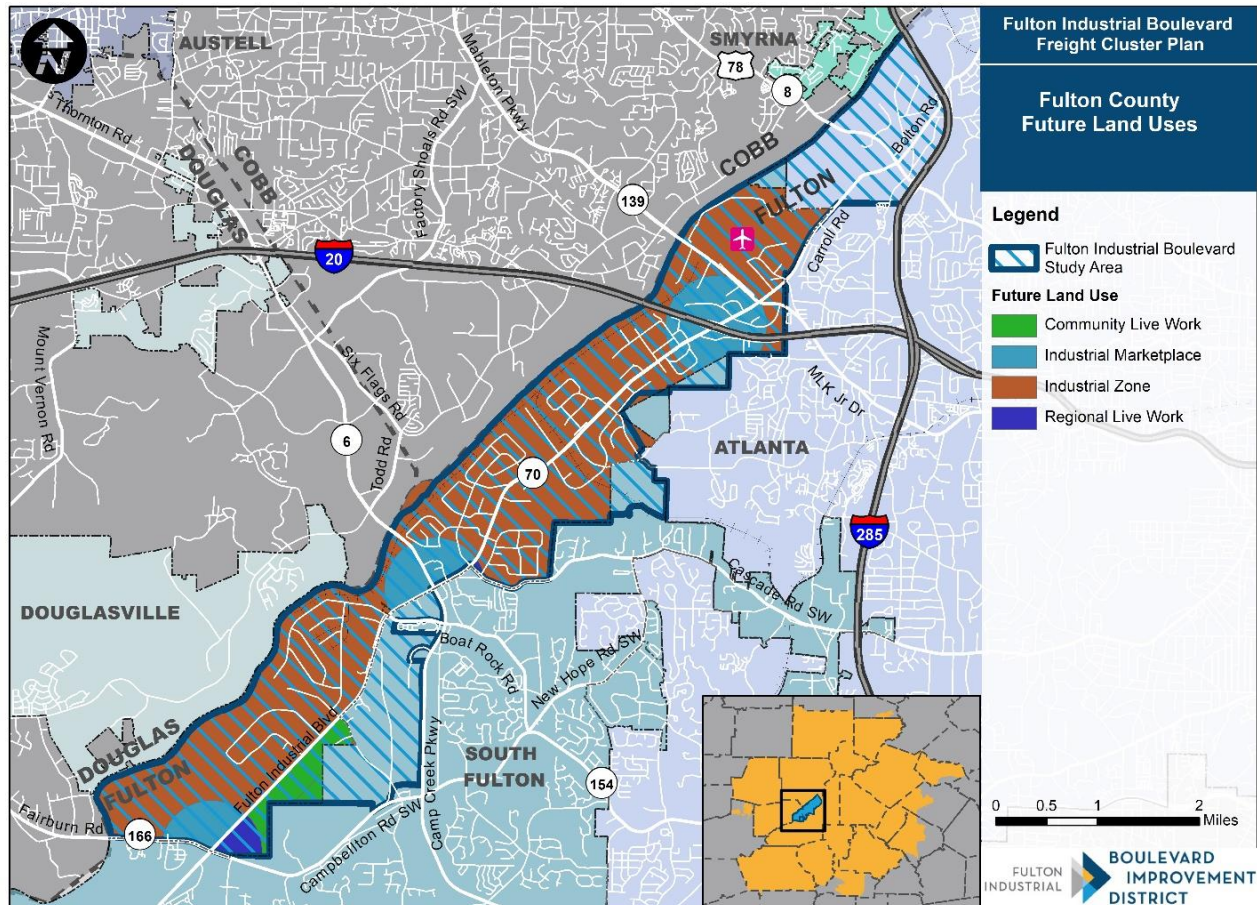
Source: Cobb County, Office of Community Development

4.10.2 Future Land Uses

The CID's municipal partner comprehensive plans were also examined to understand how land uses may evolve over time. In addition to the comprehensive plans, a number of subarea plans that include portions of the CID and address land use have been conducted over the years. These include the Neighborhood Planning Unit H (NPU-H) Master Plan, the Boulevard CID Master Plan, Fulton County Executive Airport Technical Assistance Panel Report, and the Chattahoochee Riverlands Greenway Study. These plans provide insight at the neighborhood scale into the types of developments that may characterize future land use in the CID study area and have an impact on freight mobility.

As shown in Figure 65, the long-term vision for the portion of the CID in unincorporated Fulton County is consistent with current development patterns. The CID is shown as an industrial zone which includes manufacturing, warehousing, and other economic activities that are characteristic of current land uses. At key nodes along the SR 70/Fulton Industrial Boulevard corridor (at I-20, SR 6/Camp Creek Parkway, and SR 154/Campbellton Road), an industrial marketplace is shown as future land use. The industrial marketplace character area designation is intended to concentrate commercial activity at certain nodes along the SR 70/Fulton Industrial Boulevard corridor to serve the needs of employees and nearby residential neighborhoods.

Figure 65: Fulton County Future Land Uses



Source: Fulton County, Department of Public Works

The industrial marketplace character area designation is consistent with many of the long-term land use recommendations in the Fulton County Executive Airport Technical Assistance Panel (TAP) Report and the Chattahoochee Riverlands Greenway Study. The TAP Report focused on market opportunities at Aviation Circle and the intersection of SR 139/Martin Luther King Jr. Drive and SR 70/Fulton Industrial Boulevard. Some of the TAP Report's recommendations included adding a mix of office or flex-type uses to the airport campus, developing land around the airport to create a Main Street or Town Center, and providing convenience retail and amenity space (e.g., grocery, fitness center, pocket park).

The Chattahoochee Riverlands Greenway Study focused on identifying the actions needed to improve the ecological health of the Chattahoochee River and to create a network of linear greenways along its banks in Metro Atlanta. Within the CID study area, the greenway (e.g., multi-use trail) would have a public access point at the northern boundary of the CID and also connect to the Proctor Creek Trail (see Figure 66). The development of a greenway in the CID study area would provide a common space and active transportation amenity for the area's businesses and residents. In addition, the use of greenspace as a buffer between industrial and non-industrial land uses is generally viewed as a best practice for mitigating freight-related

conflicts. However, steps would need to be taken to facilitate safe pedestrian and bicyclist access to the greenway at points where the greenway and freight network intersect.

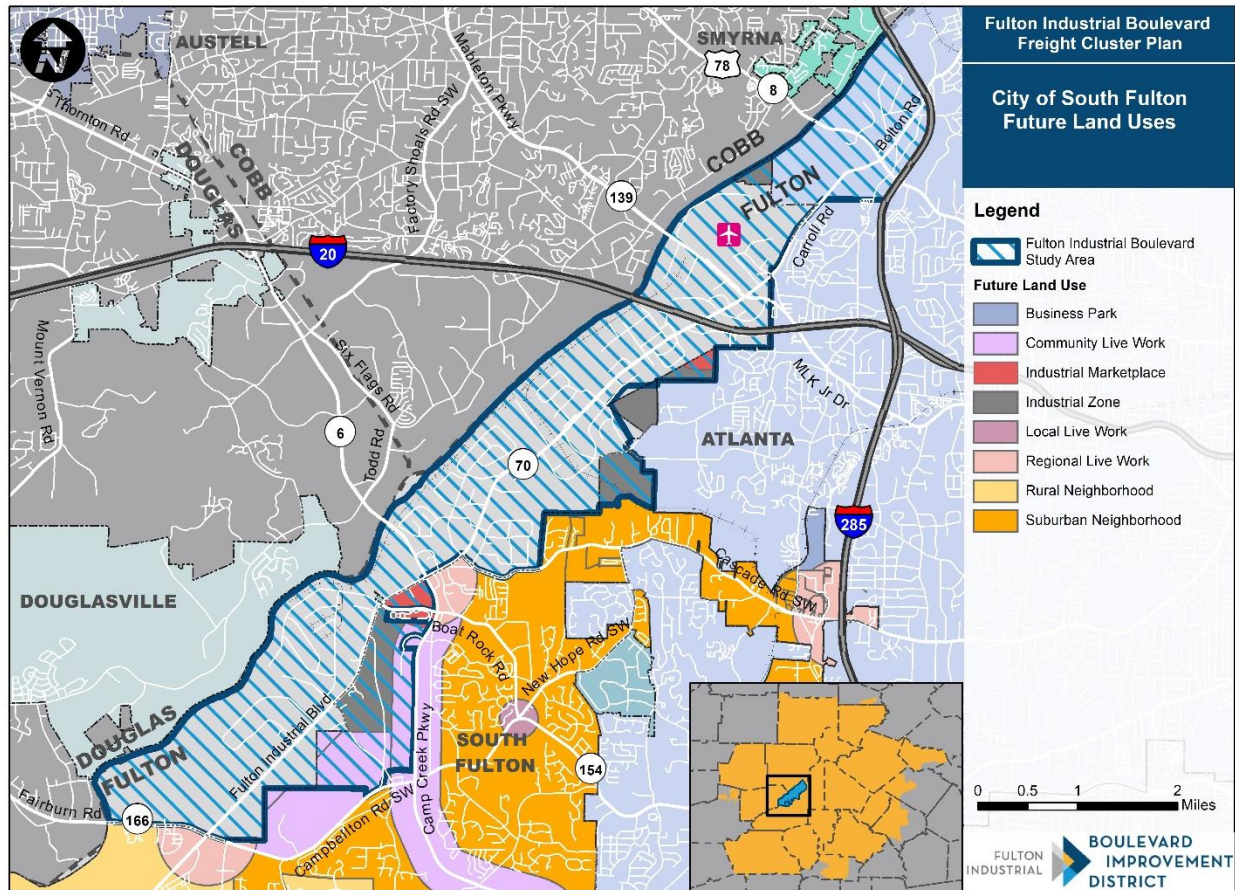
Figure 66: Proctor Creek Trail Extension



Source: *Chattahoochee RiverLands Greenway Study, 2020*

Future land uses for the City of South Fulton are shown in Figure 67. Overall, the long-term vision for land that borders the CID is to develop in a manner that can be described as suburban neighborhood or community live work in character. The intent of the suburban neighborhood character area is to provide a wide diversity of housing types and affordability while preserving the surrounding natural, agricultural, and rural areas. The intent of the community live work character area is to provide a mix of commercial, office, and residential uses at intersections and along corridors. It allows the vertical and horizontal mixing of uses, which includes medium and high-density residential housing, such as duplexes and townhomes. Commercial services, such as banks, drug stores, offices, and multi-tenant shopping centers, are also allowed. The community live work designation along major corridors such as SR 6/Camp Creek Parkway and SR 154/Campbellton Road encourages much more commercial and higher density residential development than currently exists.

Figure 67: City of South Fulton Future Land Uses



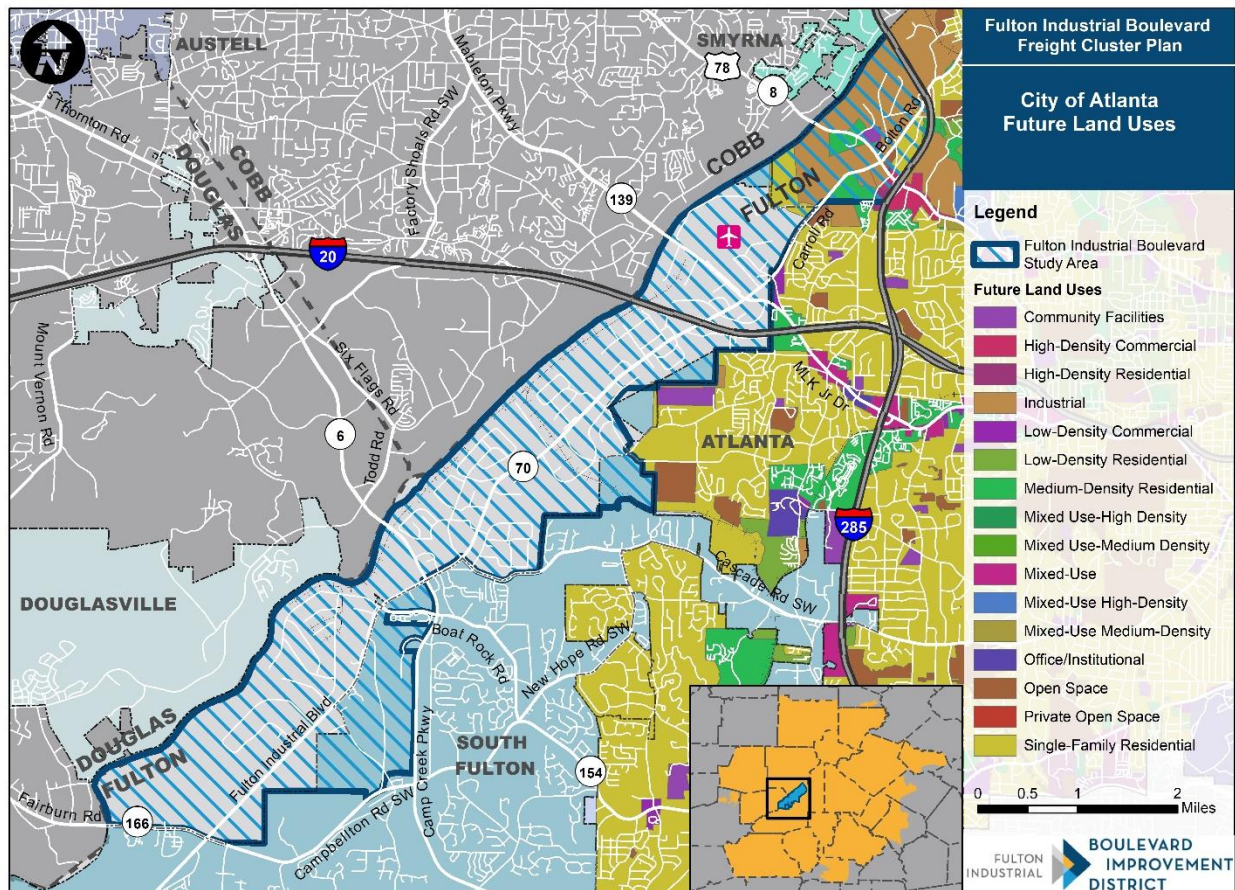
Source: City of South Fulton, Open GIS Site

The long-term vision for future land use in the areas of the City of Atlanta that border the CID are largely consistent with existing land uses, which is primarily single-family residential (see Figure 68). However, there is encouragement of some medium- and high-density residential near the SR 8/US 78/US 278/Donald L. Hollowell Parkway and Bolton Road node at the northern end of the CID. Also at this node, the future land use designation denotes high-density commercial and mixed-use for parcels just outside the CID along SR 8/US 78/US 278/Donald L. Hollowell Parkway (see Figure 69). Notably, a portion of the Petro travel center at this location is designated as high-density commercial for a future land use while the remainder is designated as industrial. The high-density land use designation at this site would allow for commercial uses such as retail, restaurants, office, and services with building heights over 3 stories being typical.

Additional insight into future land uses for areas bordering the CID are drawn from the 2020 NPU-H Master Plan. The NPU-H Master Plan provides the strategy for the growth and development of NPU-H's neighborhoods. This includes areas within the CID (e.g., the United Parcel Service [UPS] Southeast Metropolitan Automated Routing Terminal [SMART] Hub) and multiple neighborhoods along its borders. Land use was a core component of the master plan.

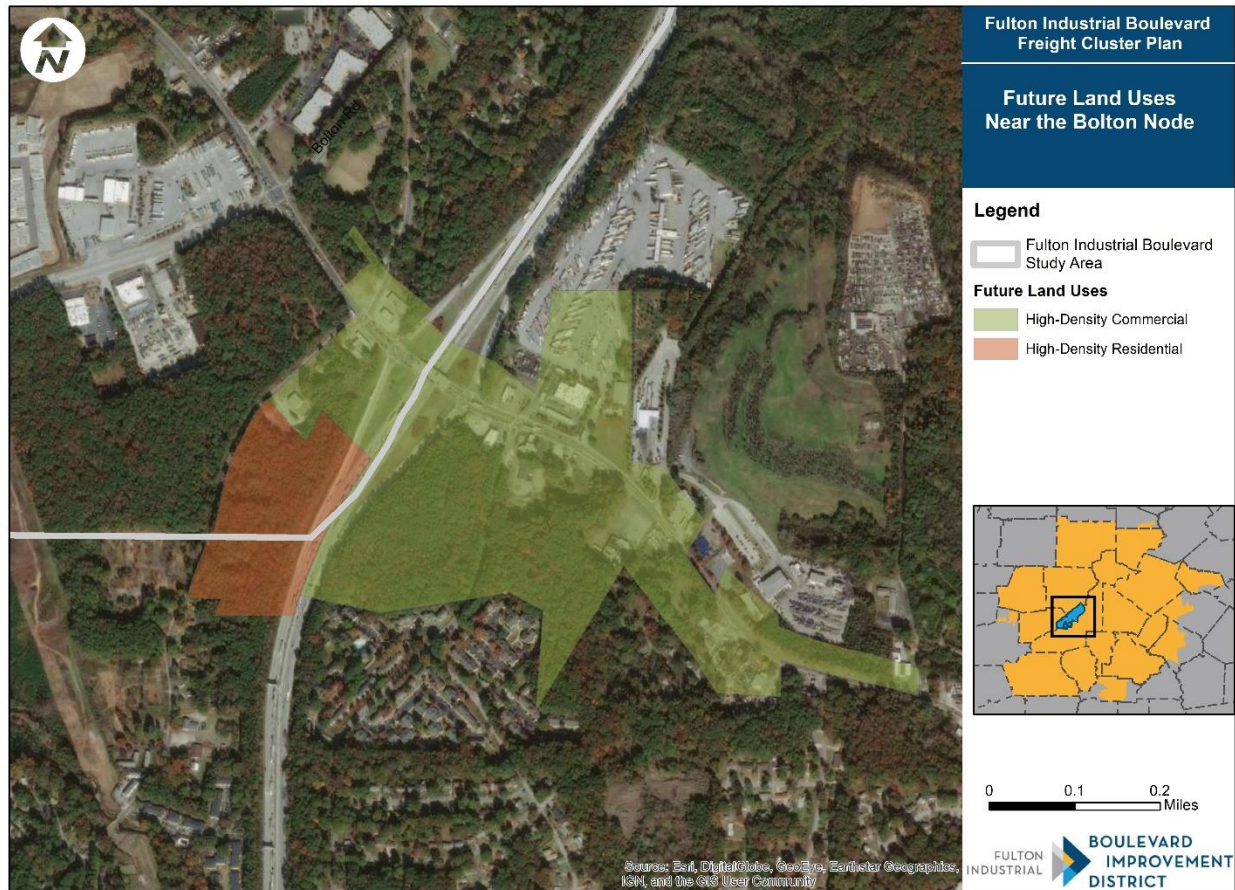
Notably, the NPU-H Master Plan recommended changing the future land use along Bolton Road between SR 8/US 78/US 278/Donald L. Hollowell Parkway and Sandy Creek, which is east of the CID's boundaries. At this node, the master plan recommended that future land use be changed from medium-density residential to a combination of high-density residential and mixed-use. As shown in Figure 70, the intent of this recommendation was to encourage a mix of housing types and mixed-use development that could include office and retail uses. In addition, the recommendation called for preserving landscape buffers for I-285 and the Fulton County Airport-Brown Field and developing multi-use trails along Sandy Creek on the land owned by Fulton County.

Figure 68: City of Atlanta Future Land Uses



Source: City of Atlanta, Office of Zoning and Development

Figure 69: City of Atlanta Future Land Uses Near the Bolton Node



Source: City of Atlanta, Office of Zoning and Development

Figure 70: NPU-H Master Plan Future Land Uses Along Bolton Road

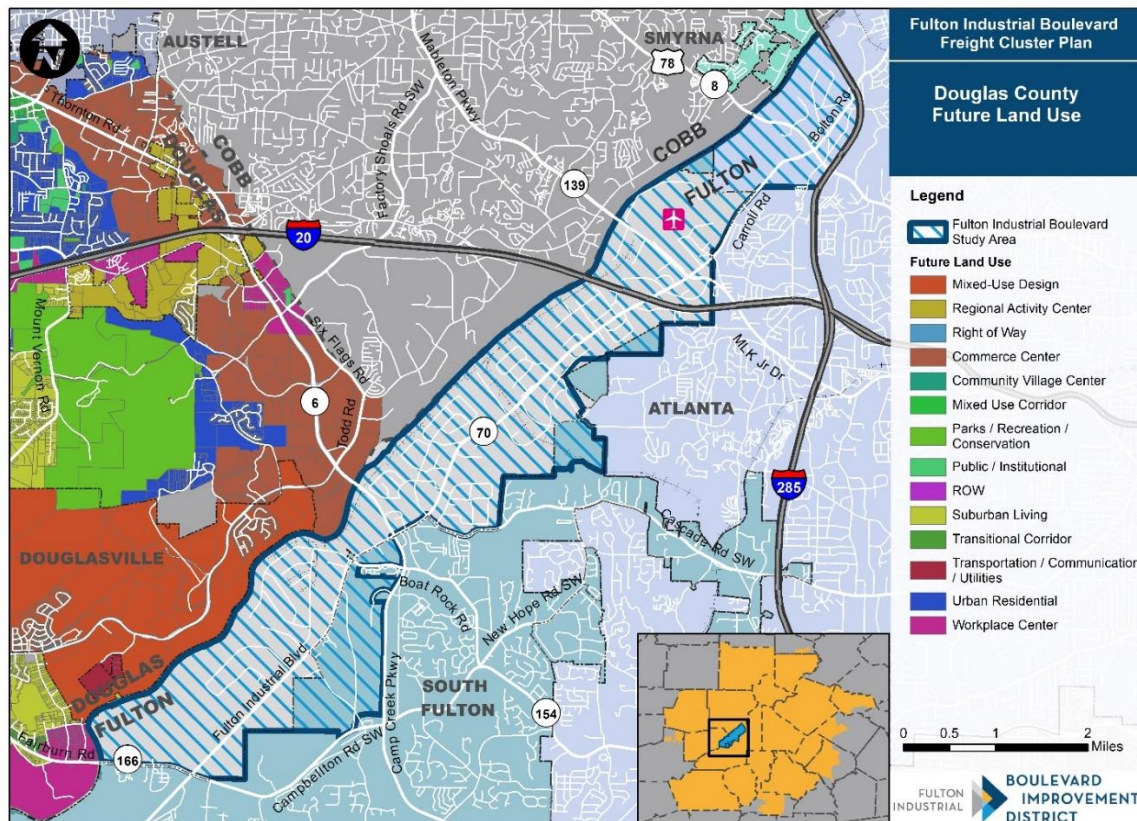


Source: City of Atlanta, NPU-H Master Plan, October 2020

Future land uses in neighboring jurisdictions, namely the City of Douglasville and Cobb County, were also examined in order to understand their potential impacts on the CID. The long-term vision for the portion of the City of Douglasville bordering the CID (e.g., the Sweetwater area which is roughly between SR 6/Thornton Road to SR 154/Fairburn Road) is outlined in the 2018 Comprehensive Plan Update and the Sweetwater Master Plan. The plans encourage future land uses that emphasize greenspace, reduce conflicts between freight and non-freight transportation modes, and provide amenities to residents and employees. The future land use is designated as mixed-use (see Figure 71), which is intended to encourage innovative designs that include at least two types of land use that are otherwise not allowed together in order to promote unique solutions to growth issues. In the Sweetwater area, mixed-use calls for a combination of residential, hospitality, retail, and industrial.

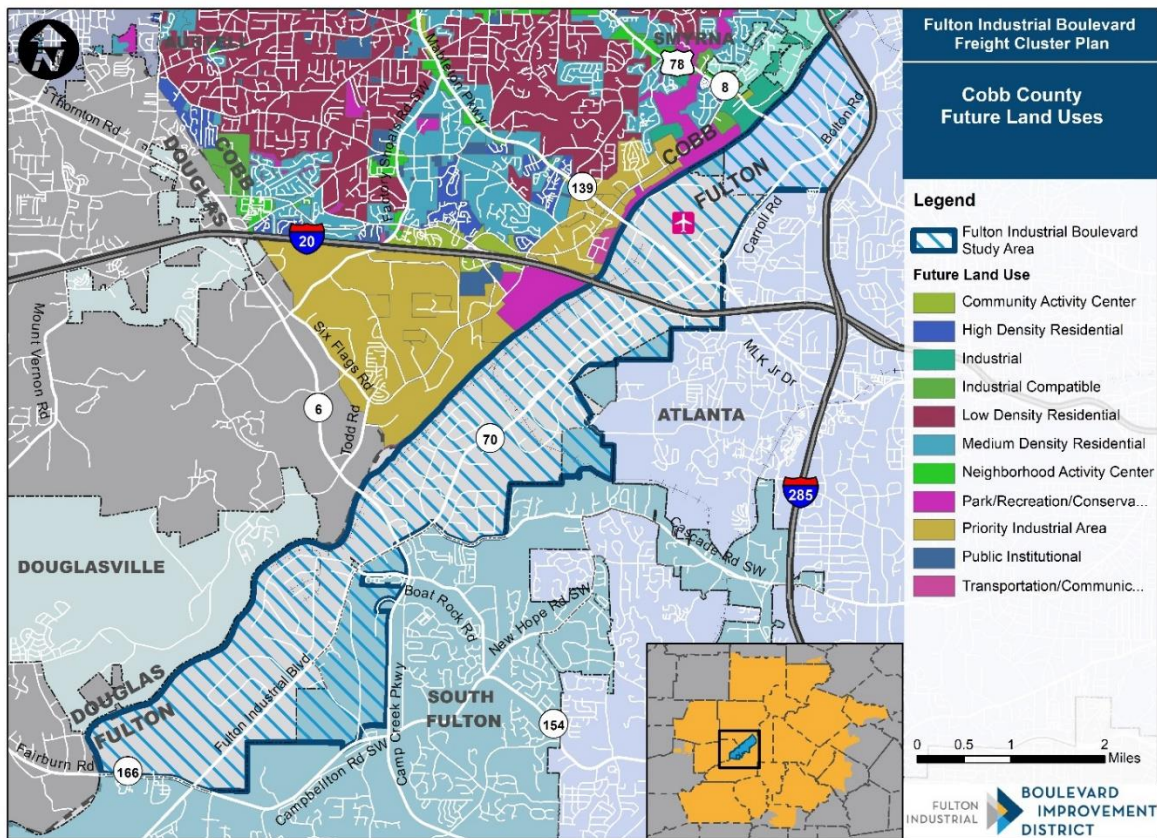
For the portion of Cobb County that borders the CID, proposed future land uses are largely consistent with existing land uses (see Figure 72). Much of the portion of the unincorporated area of Cobb County that borders the CID has a priority industrial area (PIA) future land use designation. The PIA category strategically protects the most important industrial and industrial compatible land areas in unincorporated Cobb County. Increased development throughout the County has resulted in the conversion of industrial properties to other land uses. Under the PIA designation, more stringent criteria must be considered in attempts to alter the land use. Criteria include the estimated impact to jobs and tax base, viability of the new land use, cost of transitioning to a new land use, and potential negative impacts to adjacent industrial areas.

Figure 71: Douglas County Future Land Uses



Source: Douglas County, Planning and Zoning Department

Figure 72: Cobb County Future Land Uses



Source: Cobb County Cobb Open GIS Data Library

4.10.3 Land Use Considerations for the CID Study Area

Detailed recommendations for addressing challenges related to land use will be developed as part of Task 6. Some issues to consider include the following:

- The majority of land within the CID is industrial, which is a positive attribute as it limits the potential for conflicts resulting from incompatible land uses. However, the CID is surrounded by predominantly single-family residential land uses. Incompatible land uses at the CID's boundaries can create challenges in the form of freight and non-freight vehicle conflicts along the study area's main corridors, such as SR 70/Fulton Industrial Boulevard.
- Fulton County is expected to add over 462,000 residents by 2050 relative to the 2015 baseline.²⁵ The areas surrounding the Boulevard CID are likely to share in that growth, implying more residents in its neighboring communities. This further implies growth in commuter traffic volumes as those

²⁵ Atlanta Regional Commission, ARC Series 16 Forecast Dashboard, <https://33n.atlantaregional.com/arc-series-16-forecast>.

residents will use shared corridors with the CID (e.g., Cascade Road, SR 154 Campbellton Road, SR 70/Fulton Industrial Boulevard) to access jobs, shopping, and their homes.

- Related to expected growth in residential development in the communities surrounding the Boulevard CID is corresponding growth in e-commerce home deliveries to those areas. Discussed in greater detail in the Emerging Freight Trends section, the Boulevard CID is currently (and expected to continue) a prime target for the development of e-commerce logistics facilities. Much of the e-commerce traffic activity to serve those growing communities could emanate from the Boulevard CID.
 - The long-term vision for high-density commercial and mixed-use future land uses at certain locations (e.g., Bolton Road at the northern end of the CID, SR 8/US 78/US 278/Donald L. Hollowell Parkway at the northern end of the CID, Fulton County Airport) in or near the CID may create conflicts unless steps are taken to mitigate them. Potential mitigation steps could be taking action to preserve industrial land uses, creating buffer zones to separate industrial and non-industrial land uses, and operational strategies that work to separate freight and non-freight traffic on different corridors, among others.
 - Though the development of publicly owned land along the Chattahoochee River does not represent a conflict in land use, it does reinforce the importance of pedestrian infrastructure throughout the CID to facilitate access to this future amenity. It also reinforces the importance of supporting investments in environmental infrastructure, such as bioswales to concentrate and convey stormwater runoff.
-

5 TRENDS AND EXPECTED CHANGES

This section of the report identifies emerging trends and issues that are impacting, or could potentially impact, drivers of freight demand and logistics patterns. Trends that increase or alter how goods move could result in a larger volume of freight moving in the CID study area, create new challenges, and/or exacerbate existing challenges. Changes in transportation cost (due to labor, regulatory, economic, technological, or other factors) could induce additional freight travel demand if the cost trends downward, or limit growth in freight demand if costs increase significantly. Understanding how trends could impact freight demand and mobility is important for determining investment needs and ultimately identifying solutions.

5.1 Growth in Electronic Commerce

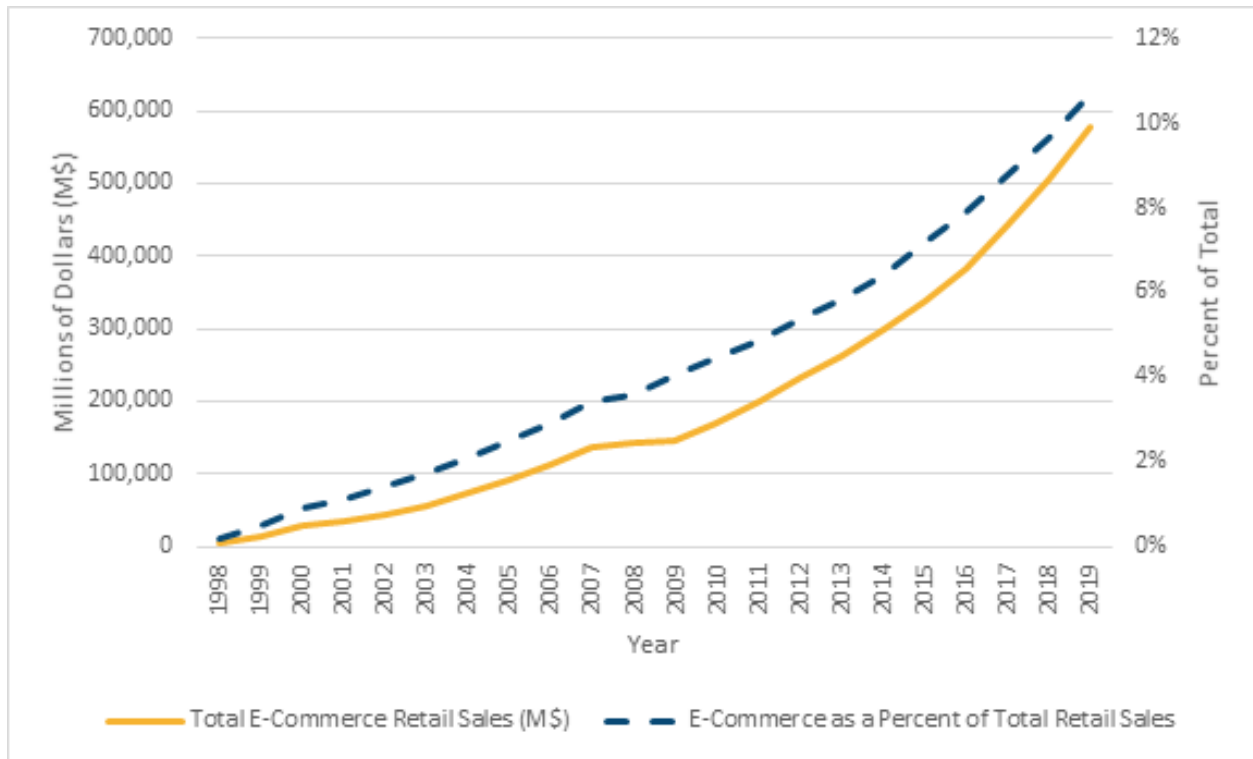
Electronic commerce (e.g., e-commerce) is the use of electronic devices and technologies to conduct commerce and trade, including purchasing goods and services on the internet with electronic banking. E-commerce increased from about 4 percent of total retail activity in 2010 to approximately 11 percent of total retail sales, nearly \$579 billion, in 2019 (see Figure 73).²⁶ Preliminary data from 2020 indicates that e-commerce's market share has grown to over 13 percent of total retail sales.²⁷ Non-store retailers account for the vast majority of e-commerce retail sales, comprising 86 percent of total sales (nearly \$499 billion) in 2019.²⁸ Motor vehicles and parts dealers are the second largest category, accounting for over 7 percent (nearly \$43 billion) of online purchases. However, as e-commerce has more broadly infiltrated the overall economy in recent years, the market segments with the largest growth in sales have been the smaller categories of clothing, food and beverage, and furniture stores. Between 2010-2019, annual growth in these three segments was 32 percent, 23 percent, and 23 percent, respectively, far outpacing the overall 2010-2019 annual growth rate of 15 percent for e-commerce sales.

²⁶ U.S. Census Bureau, "Estimated Annual U.S. Retail Trade Sales – Total and E-Commerce: 1998-2019," Annual Retail Trade Survey: 2019.

²⁷ U.S. Census Bureau, U.S. Census Bureau News, "Quarterly Retail E-Commerce Sales 4th Quarter 2020," February 19, 2021, https://www.census.gov/retail/mrts/www/data/pdf/ec_current.pdf.

²⁸ U.S. Census Bureau, "Estimated Annual U.S. Retail Trade Sales – Total and E-Commerce: 1998-2019," Annual Retail Trade Survey: 2019.

Figure 73: Annual E-Commerce Retail Sales, 1998-2019



Source: U.S. Census Bureau, Annual Retail Trade Survey, 2019

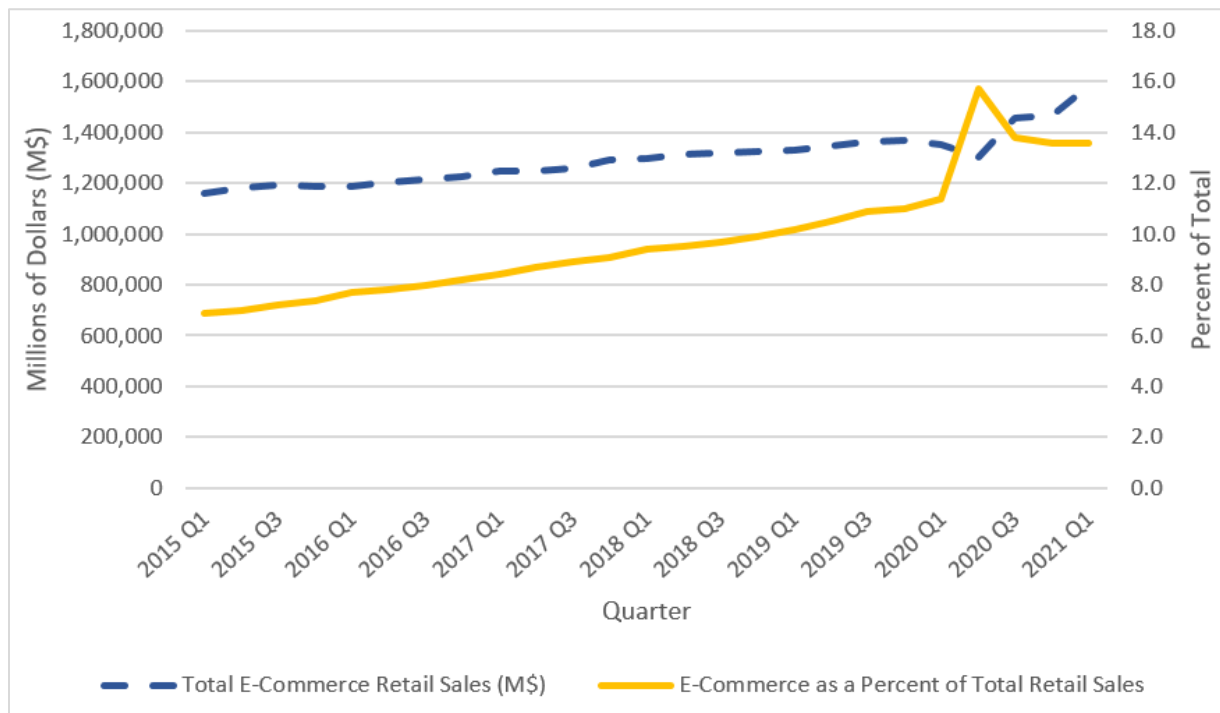
Growth in e-commerce demand appears to have been accelerated over the short-term by the COVID-19 pandemic. This is evident in preliminary quarterly e-commerce data gathered by the U.S. Census Bureau.²⁹ Shelter-in-place orders in the U.S. began late in the first quarter of 2020 with California issuing the first order in the U.S. on March 19³⁰ and Georgia issuing its first order on March 23³¹. As shown in Figure 73, there was a sharp increase in e-commerce retail sales as a percentage of total retail sales between the first and second quarters of 2020. After the peak in demand at the beginning of quarter 2, e-commerce sales as a percentage of total retail sales declined over the remainder of 2020. However, even with the decline e-commerce's 2020 market share of retail sales will likely be well above its 2019 value once the data are finalized.

²⁹ Retail Indicators Branch, U.S. Census Bureau, Estimated Quarterly U.S. Retail Sales (Adjusted): Total and E-commerce, 2021.

³⁰ Executive Department, State of California, Executive Order N-33-20, <https://www.gov.ca.gov/wp-content/uploads/2020/03/3.19.20-attested-EO-N-33-20-COVID-19-HEALTH-ORDER.pdf>.

³¹ State of Georgia, Executive Order 03.23.20.01, <https://gov.georgia.gov/executive-action/executive-orders/2020-executive-orders>.

Figure 74. Quarterly E-Commerce Retail Sales, 2015-2021



Source: U.S. Census Bureau, Retail Indicators Branch, 2021

Some of the long-term demographic factors driving e-commerce growth include total population, population density, a relatively high population of millennials, families with young children, higher than median household incomes, and higher disposable incomes. The steady growth of e-commerce as a preferred method for purchasing consumer goods has impacted freight traffic and land use patterns in metropolitan regions, including Metro Atlanta. Proximity to the urban core as well as suburban populations drive last-mile demand, particularly for regions that are geographically spread out. Areas like the Boulevard CID are proximate to both urban and suburban areas, making it a desirable location for fulfillment center facilities.

5.2 Warehouse/Distribution Center Design and Urban Infill

The development of high-cube warehouses and urban infill logistics facilities are two related trends accompanying the growth of e-commerce as the preferred method for purchasing consumer goods. High-cube warehouses are generally considered to be buildings with at least 200,000 gross square feet of floor area, with a ceiling height of 24 feet or more, and are used primarily for the storage and/or consolidation of goods before their distribution to retail locations or other warehouses. Their high ceilings allow them to take advantage of greater storage volumes on a smaller footprint bringing cost savings and operational efficiencies to supply chains, hence their burgeoning popularity. The use of technology and automation facilitate the efficient storage and retrieval of goods at such heights, where previously these buildings would need to operate over a larger footprint. The scarcity of land, especially near urban cores, results in larger footprints being costly and, in some cases, infeasible as additional land is simply not available. Fulfillment centers for e-commerce are considered a type of high-cube warehouse along with transload facilities, short-term storage, cold storage, and parcel hubs.

Despite the preference for high-cube warehouses and newer facilities that are typically built as part of greenfield developments away from the urban core, retailers have become sensitive to the unintended consequences of this supply chain strategy. These include the impacts of distance, congestion, and poor travel time reliability on meeting consumer expectations for same-day and next-day delivery. As a result, a common practice is to position fulfillment centers close to populations centers with good access to major highways. This contrasts with previously observed trends of industrial land uses generally sprawling away from city centers. Achieving this requires existing urban infill industrial facilities to be re-purposed or rehabilitated to meet modern e-commerce logistics needs.

Both trends have already impacted the Boulevard CID and will continue to do so as growth in e-commerce demand continues. For example, UPS opened its SMART Hub, a 1.2 million square foot high-speed processing facility capable of processing approximately 100,000 parcels per hour, in the CID in 2018. Other companies have re-purposed or rehabilitated older buildings in the CID, raising ceilings and making other improvements, so that they may serve e-commerce demand. Also, in 2020 Amazon opened in the CID a more than 1.1 million square foot fulfillment center along SR 154/Campbellton Road with 40-foot minimum clear heights.³² As the CID is less than 1 hour from the core of the Metro Atlanta region and is also proximate to other regional centers, such as Perimeter Center and Cumberland, it will continue to be attractive for this type of development. As the population density and economic activity of Metro Atlanta grows, so too will the demand for goods delivered via e-commerce channels; this will result in the continued demand for land and buildings that can be repurposed to meet this growing need.

5.3 Advances in Supply Chain Operations and Design

Related to the trend of e-commerce and urban infill is the advancement of supply chain operations and design. Emerging trends in this area include warehouse automation, the use of big data and analytics for siting freight facilities (i.e., selecting an ideal location for meeting demand while meeting other objectives such as minimizing costs), and the Internet of Things. Both traditional warehouses and e-commerce fulfillment centers are becoming more automated. Despite the high cost of the initial investment, automated warehouses can result in cost savings over time. Fully automated warehouses can operate nonstop. Additionally, automated warehouses can increase throughput (the amount of goods processed per square foot) as aisles between storage racks can be narrower and the height of the racks taller due to the absence of forklifts. Automated warehouses allow more product to be handled and stored horizontally and vertically, incentivizing building designs with high ceiling heights (24 feet or more) to take advantage of the ability of equipment to reach higher heights. Amazon opened its first automated fulfillment center, an 855,000 square foot facility with 13 miles of conveyance, in St. Peters, MO in 2019.³³ In 2020, the company opened a 640,000 square foot robotics fulfillment center in Gwinnett County near Stone Mountain.³⁴ As the cost of

³² <https://www.connectcre.com/atlanta/amazon-expands-atlanta-footprint-with-1-1m-sf-logistics-deal/>

³³ Kukuljan, S. "Inside Missouri's first Amazon fulfillment center." St. Louis Business Journal, June 26, 2019, <https://www.bizjournals.com/stlouis/news/2019/06/26/inside-missouris-first-amazon-fulfillment-center.html>.

³⁴ Yeomans, C., "Amazon preparing to open first robotics fulfillment center in south Gwinnett County", Gwinnett Daily Post, September 1, 2020, https://www.gwinnettdaily.com/local/amazon-preparing-to-open-first-robotics-fulfillment-center-in-south-gwinnett-county/article_002c6fa6-ec71-11ea-9a3a-bf7f9f5ddd63.html.

automation technology declines over time, warehouses that deploy it will become more pervasive throughout the U.S., including Metro Atlanta.

Another trend is the use of big data and analytics to make freight facility location decisions. These data and analytics are being used as part of supply chain modeling and optimization tools. Supply chain modeling and optimization involves the application of mathematical models to determine the ideal locations of supply chain facilities (e.g., warehouses, distribution centers), inventory levels at those locations, and other operational aspects for the purpose of minimizing operational costs. In the 2020 iteration of an annual survey of third-party logistics (3PL) services conducted by the Pennsylvania State University, 39 percent of shippers indicated that network modeling and optimization were capabilities they looked for in 3PL providers, while 62 percent of 3PL providers indicated that they offer those capabilities.³⁵ As noted in the Technology Association of Georgia's 2020 State of Georgia's Supply Chain/Logistics Technology Ecosystem report, the application of big data and analytics to supply chains includes artificial intelligence.³⁶ The predictive capabilities of artificial intelligence in network planning are allowing markets to become more proactive, for example, by estimating how many freight vehicles are needed at specific locations based on demand.

The Internet of things (IoT) is another emerging trend that is relevant for freight planning. IoT, or the "Physical Internet," describes the network of physical objects – or "things" – that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the Internet. The potential for IoT to positively impact the transport, handling, and storage of goods and other supply chain management activities is substantial. IoT's core abilities of allowing physical objects to connect and exchange data complements supply chain management's main objectives of tracking and monitoring cargo, inventory, and assets.³⁷ For example, a shipment of medications can communicate to a supply chain manager or connected thermostat that its temperature has gone outside its acceptable range; a truck enabled with a predictive maintenance application can alert a fleet manager that a repair is needed before breakdown occurs; a retail store outfitted with IoT sensors can automate in-store inventory levels and provide customers with no-contact payment options, such as the fully automated Amazon Go Grocery store³⁸. Other key areas of supply chain management impacted by IoT include real-time location tracking, storage condition monitoring (e.g., goods that must be stored at certain temperature ranges), forecasting product movement and arrivals, goods location in the warehouse, improved asset management, automation, and improved resource management, among others. Overall, for the private sector IoT could enable better on-time delivery performance, lower supply chain costs, and reduced prices for end consumers.

This trend is relevant to public sector freight planning because these connected devices can also be leveraged to improve conditions on public roadways and reduce environmental impacts. A critical component of IoT is its ability to interact with smart infrastructure. For example, IoT devices that

³⁵ <http://3plstudy.com/3plindex.php>

³⁶ https://www.tagonline.org/wp-content/uploads/2020/01/2019-Supply-Chain-Report_compressed.pdf

³⁷ Ceurstemont, S. "How the 'physical internet' could revolutionise the way goods are moved", Horizon Magazine, February 15, 2021, <https://horizon-magazine.eu/article/how-physical-internet-could-revolutionise-way-goods-are-moved.html>

³⁸ Golden, H., "'Just walk out': Amazon debuts its first supermarket with no checkout lines", The Guardian, February 27, 2020, <https://www.theguardian.com/us-news/2020/feb/25/amazon-go-grocery-supermarket-seattle-technology>.

communicate with connected infrastructure (e.g., smart traffic signals, dynamic message signs, weigh-in-motion stations) could provide more accurate corridor-level estimates of freight travel times and volumes, allowing traffic conditions on those corridors to be better managed. Improved management could be achieved through freight signal priority, truck parking information systems, and other freight-specific operational strategies (refer to the Transportation Data and Operational/Management Technologies for more details on these applications). Overall, IoT devices have the potential to provide transportation engineers, planners, and other professionals more abundant and improved data on freight operations which would allow them to better develop strategies for addressing current and future needs. This, of course, assumes that the data from IoT devices is shared with the public sector as it is privately owned.

5.4 Connected and Autonomous Freight Vehicles

While much of the attention on connected and autonomous vehicle technology has focused on passenger cars, an increasing number of trucks are utilizing these technologies including sensors, communications, and/or processing software technologies for both steering and braking assistance. Due to ongoing industry challenges to attract new drivers and the continued need to improve safety, the benefits of greater vehicle automation to the trucking industry are substantial. The Society of Automation Engineers' automation levels classification scheme is the industry standard in terms of measuring the degree of automation in a vehicle (see Table 11). Currently, there are no viable commercial systems for fully autonomous trucks. The highest level of truck automation commercially available is "advanced driver assistance" (Level 1). Partial and conditional automation are in the pre-commercial stage, and high and full automation are in research and development and are not likely to be available over the medium-term.

Table 11: Society of Automation Engineers (SAE) Automation Levels

Level	Title	Description
0	No Automation	Zero autonomy; the driver performs all driving tasks.
1	Driver Assistance	Vehicle is controlled by the driver, but some driving assist features may be included in the vehicle design.
2	Partial Automation	Vehicle has combined automated functions, like acceleration and steering, but the driver must be ready to take control of the vehicle at all times with notice.
3	Conditional Automation	Driver is a necessity, but is not required to monitor the environment. The driver must be ready to take control of the vehicle at all times with notice.
4	High Automation	The vehicle is capable of performing all driving functions under certain conditions. The driver may have the option to control the vehicle.
5	Full Automation	The vehicle is capable of performing all driving functions under all conditions. The driver may have the option to control the vehicle.

Source: Society of Automation Engineers

Advanced driver assistance systems (ADAS) enhance the safety, efficiency, or experience of driving by assisting in or automating real-time functions traditionally performed by the driver. They use a variety of internal and external sensors (such as GPS, video, radar, and lidar) to provide information to drivers about navigation and potential conflicts. ADAS form the foundation of autonomy and represent a significant

advance in vehicle safety even without full autonomy. Multiple studies have found these technologies to be effective at reducing truck crashes.^{39,40,41,42,43} Examples of these systems include:

- Electronic stability control (ESC) and roll stability control (RSC) which use real-time information such as weight, speed, acceleration, and steering to detect the potential for a vehicle rollover or loss of steering control.
- Forward collision warning (FCW) systems which provide a warning to the driver if the distance or time to the lead vehicle falls below a certain threshold (or a series of escalating warnings as the risk of a collision increases).
- Autonomous emergency braking (AEB) which allows the vehicle to brake independently of the driver to avoid or mitigate an imminent rear-end collision. AEB is often integrated with FCW as a forward collision avoidance system (FCAS).

There are multiple companies actively engaged in the development of fully autonomous trucks. On a per-mile basis, labor and fuel are the two highest operational costs for the trucking industry. In theory, if drivers could be replaced then autonomous trucks would significantly reduce both of these costs. Other potential benefits include reduced driver stress, fewer accidents, less congestion, and lower carbon emissions. Thus, given the trucking industry's tight profit margins and the ongoing labor challenge of recruiting new drivers, some have predicted that autonomous trucks will outpace autonomous passenger vehicles in terms of widespread commercial adoption.^{44, 45, 46} Nevertheless, the prevailing view in the motor carrier industry is that autonomous operations will not find public acceptance until autonomous automobiles become common.

An example of one company pushing the trend towards autonomous trucks is Embark. Embark is currently testing a system that automates the freeway portion of a truck's journey and allows the driver to take over to navigate the more complex local roads. The approach is designed to enable truck drivers to complete more journeys per day, while spending less time actually driving. Another example company is TuSimple, which has been performing depot-to-depot test runs in Phoenix, Tucson, Dallas, El Paso, Houston, and

³⁹ Hickman, J. et al., "Onboard Safety Systems Effectiveness Evaluation Final Report," Federal Motor Carrier Safety Administration, FMCSA-RRT-12-012, 2013, <https://rosap.nhtl.bts.gov/view/dot/10>.

⁴⁰ Woodroffe, J. et al., "Safety Benefits of Stability Control Systems for Tractor-Semitrailers," National Highway Traffic Safety Administration, DOT HS 811 205, 2009, <https://deepblue.lib.umich.edu/handle/2027.42/64283>.

⁴¹ Federal Motor Carrier Safety Administration, "Benefit-Cost Analyses of Onboard Safety Systems," Tech Brief, FMCSA-RRT-09-023, February 2009

⁴² National Transportation Safety Board, "The Use of Forward Collision Avoidance Systems to Prevent and Mitigate Rear-End Crashes," 2015, <https://www.nts.gov/safety/safety-studies/Documents/SIR1501.pdf>.

⁴³ Belzowski, B. et al., "Tracking the Use of Onboard Safety Technologies Across the Truck Fleet," Federal Motor Carrier Safety Administration, DTMC75-07-C-00004, 2009, <https://rosap.nhtl.bts.gov/view/dot/24615>.

⁴⁴ Deloitte, "Autonomous trucks lead the way," February 17, 2001, <https://www2.deloitte.com/us/en/insights/focus/future-of-mobility/autonomous-trucks-lead-the-way.html/#endnote-sup-6>

⁴⁵ Reuters, "Daimler takes 'reality check' on robotaxis," November 14, 2019, <https://www.reuters.com/article/us-daimler-autonomous/daimler-ceo-says-robotaxis-business-is-not-realistic-idUSKBN1XO1FM>.

⁴⁶ Naughton, K., "Waymo CEO Sees Driverless Trucking Catching on Faster than Taxis," Bloomberg, October 28, 2019, <https://www.bloombergquint.com/business/waymo-ceo-driverless-cargo-delivery-may-arrive-before-taxi-cabs>.

San Antonio⁴⁷. Other companies with promising pilot programs include Waymo (a subsidiary of Google's parent Alphabet), Aurora, Locomotion, and Plus.ai.

Another motivating factor behind the emerging trend of autonomous trucks is that it provides the ability for fleet operators to deploy trucks in platoons. Truck platoons use vehicle-to-vehicle (V2V) communications and autonomous vehicle control technology to electronically "tether" tractor-trailers together in a convoy formation.⁴⁸ These vehicles automatically maintain a set, close distance between each other while connected (about 20 to 75 feet⁴⁹). The truck at the head of the platoon acts as the leader, with the trailing vehicles reacting and changing in its movement. Early phases of truck platooning are expected to still use drivers, though at SAE Level 5 autonomy platoons could operate with a driver only in the lead vehicle with the remaining vehicles being automated. One of the primary benefits of platooning is greater fuel efficiency (and the associated cost savings), which stems from reduced aerodynamic drag on the following vehicle(s). One study estimated that the lead truck may experience fuel savings of up to nearly 5 percent while trailing trucks may experience savings of up to nearly 10 percent.⁵⁰ Another potential benefit is safety as braking is automatic and immediate with connected trailing vehicles only needing a fraction of the time it would require for a human to react.

While the private sector has been leading the development of connected and autonomous vehicle technology, the government has also been investing. Investments in smart infrastructure and developing policies and regulations to support connected and autonomous vehicle technology have been made at the federal, state, and regional level. At the federal level, USDOT has funded the Ann Arbor Connected Vehicle Environment, Connected Vehicle Pilots Program, and the Advanced Transportation and Congestion Management Technologies Deployment Program to advance vehicle communications technologies.⁵¹ USDOT also released its Federal Automated Vehicle Policy in 2016, the Automated Driving Systems 2.0: Vision for Safety in 2017, and Preparing for the Future of Transportation: Automated Vehicle 3.0 in 2018, which provides more detailed guidance and best practices in terms of testing and deployment of automated technologies. At the statewide level, GDOT is engaged in the Statewide Connected Vehicle Deployment Experience and Plan. The goal of this program is to develop infrastructure, network, and business processes to support V2I infrastructure applications that would improve safety and mobility.⁵² The program includes pilot projects to deploy roadside units on SR 141/Peachtree Street and SR 8/Ponce de Leon Ave. Regional initiatives include the Atlanta Regional Commission's Connected Vehicle Project and the Gwinnett County Connected Vehicle Technology Master Plan. These initiatives involve installing 1,700 roadside units

⁴⁷ Ackerman, E. "This Year, Autonomous Trucks Will Take to the Road With No One on Board," IEEE Spectrum, January 4, 2021.

⁴⁸ European Automobile Manufacturers Association, https://www.acea.be/uploads/publications/Platooning_roadmap.pdf.

⁴⁹ Lammert, M., Duran, A., Diez, J., Burton, K. et al., "Effect of Platooning on Fuel Consumption of Class 8 Vehicles Over a Range of Speeds, Following Distances, and Mass," SAE Int. J. Commer. Veh. 7(2):2014, doi:10.4271/2014-01-2438

⁵⁰ Ibid.

⁵¹ <https://www.transportation.gov/sites/dot.gov/files/docs/policy-initiatives/automated-vehicles/320711/preparing-future-transportation-automated-vehicle-30.pdf>

⁵² <https://traffic.transportation.org/wp-content/uploads/sites/26/2018/07/GDOT-Connected-Vehicles.pdf>

(RSU) that communicate with dedicated short-range communications (DSRC) and cellular technology along and near smart corridors.

5.5 Commercial Vehicle Electrification

While passenger cars have generated the most sales of electric vehicles, electric trucks are seen as vital to reducing business costs and the overall environmental impact of the transportation sector. For example, fuel typically represents the second highest cost to motor carriers (about 24 percent of total cost), behind driver wages, on a per mile basis.⁵³ Historically, electricity prices have been lower and more stable than gasoline and diesel prices and thus electricity offers the opportunity for an industry characterized by tight profit margins to achieve considerable cost savings. In addition, studies have estimated that the total cost of ownership of battery electric day cab tractors is lower than their diesel counterparts over the long-term.⁵⁴,⁵⁵ Day cabs for regional operations (i.e., an operating range of 250 to 300 miles) are expected to be the first application for electric trucks.

Besides the ability of freight vehicle electrification to reduce business costs, the potential to mitigate the negative externalities attributed to goods movement is a motivating factor. For example, while medium- and heavy-duty vehicles represented only about 5 percent of registered vehicles in 2018, they were responsible for over 26 percent of the U.S. transportation sector's fuel consumption⁵⁶ and 23 percent of the sector's greenhouse gas (GHG) emissions⁵⁷. Electrification would also help to address an important transportation equity challenge related to public health. Respiratory diseases attributed to tailpipe emissions disproportionately affect disadvantaged communities due to their proximity to major highways, rail yards, trucking terminals, and other freight-intensive land uses.⁵⁸ Because of the potential economic and environmental benefits of electrification, several operators of private (e.g., Walmart and Amazon) and for-profit fleets (e.g., Knight-Swift and Dependable Highway Express) have made investments to achieve electric and zero-emission fleets.⁵⁹

⁵³ American Transportation Research Institute, *Operational Costs of Trucking*, 2019.

⁵⁴ California Air Resources Board, "Advanced Clean Trucks Total Cost of Ownership Discussion Document: Preliminary Draft for Comment," February 22, 2019, https://ww2.arb.ca.gov/sites/default/files/2020-06/190225tco_ADA.pdf.

⁵⁵ Phadke, A. et al., "Why Regional and Long-Haul Trucks are Primed for Electrification Now," March 2021, Lawrence Berkeley National Laboratory, https://eta-publications.lbl.gov/sites/default/files/updated_5_final_ehdv_report_033121.pdf.

⁵⁶ FHWA, Table VM-1 - Highway Statistics 2018 – Policy: Federal Highway Administration, <https://www.fhwa.dot.gov/policyinformation/statistics/2018/pdf/vm1.pdf>.

⁵⁷ Environmental Protection Agency – Office of Transportation and Air Quality, *Fast Facts: U.S. Transportation Sector Greenhouse Gas Emissions 1990-2018*, <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P100ZK4P.pdf>.

⁵⁸ American Lung Association, *American Lung Association Energy Policy Development: Transportation Background Document*, 2015, www.lung.org/getmedia/10333ba7-8f6f-472e-8392-1388cd5fd754/transportation-backgroundunder.pdf.pdf.

⁵⁹ Ronan, D., "Trucking Industry Making Strides Toward Electrification," *Transport Topics*, March 11, 2021, <https://www.ttnews.com/articles/trucking-industry-making-strides-toward-electrification>.

Despite the potential for electrification to generate industry cost savings and positive environmental and transportation equity impacts, it is not without its challenges. This is evidenced by the low market penetration of electric freight vehicles. Only about 600 electric heavy-duty vehicles are estimated to have been sold in the U.S. and Canada in 2019.^{60,61} Some of the key barriers to heavy-duty vehicle electrification include⁶²:

- **Higher Upfront Vehicle Costs.** High vehicle purchase price is perceived as one of the largest barriers to freight electrification. Electric trucks may be as much as 3.5 times the average cost of a diesel truck.⁶³ Batteries are the most expensive component of an electric vehicle. High upfront costs particularly impact smaller carriers and owner-operators as they are not likely to have the capital or confirmed client demand to invest in electric vehicles.
- **Costly and Complex Charging Infrastructure Processes.** The planning and installing of electric vehicle infrastructure are one of the largest barriers to deploying an electric truck fleet. Electric vehicle charging stations vary in the speed (and subsequently cost) with which they can fully charge a vehicle. Aside from selecting and purchasing the stations, motor carriers must deal with the complexity and cost associated with siting, planning, commercial utility interconnection requirements, construction permitting, and final installation. To address this barrier, some automotive, utility, and infrastructure companies are testing technology that allows electric vehicles to charge while in-motion via under-road pads that wirelessly transmit electricity to receivers mounted underneath vehicles or using overhead wires.⁶⁴ The process, known as dynamic charging, could reduce the cost of charging infrastructure for motor carriers if they could rely on a publicly available source of energy to supplement their own investments.
- **Commercial and Industrial Electricity Rate Structures.** Electricity charging costs in the U.S. are on average much lower than comparative diesel fueling costs.⁶⁵ However, the combination of substantial electricity demand requirements, limited down time to charge larger class vehicles, and utility market rate structures can greatly reduce the financial savings of electricity over diesel. Heavy-duty vehicles must be able to charge at reasonably priced rates that meet their operational needs. Without greater flexibility in rate structures, it may be financially challenging for fleet operators to consider electrifying their fleets.

⁶⁰ Environmental Defense Fund, *Race to Zero*, October 2020, https://www.edf.org/sites/default/files/documents/Race%20to%20Zero-ICCT_EDF_PQ-FINAL.pdf

⁶¹ The Environmental Defense Fund report defines heavy-duty vehicles are defined as those with gross vehicle weight ratings of 7,716 lbs. or more.

⁶² Electrification Coalition, *Electrifying Freight: Pathways to Accelerating the Transition*, <https://www.electrificationcoalition.org/wp-content/uploads/2020/11/Electrifying-Freight-Pathways-to-Accelerating-the-Transition.pdf>.

⁶³ This estimate is based on 2018 average capital costs for heavy-duty diesel and electric trucks presented in the 2019 California Air Resources Board "Advanced Clean Trucks Total Cost of Ownership Discussion Document: Preliminary Draft for Comment" report.

⁶⁴ Hodari, D., "These Companies Want to Charge Your Electric Vehicle as You Drive," *Wall Street Journal*, January 18, 2021.

⁶⁵ "Fuel Prices." Alternative Fuels Data Center: Fuel Prices, U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy's Vehicle Technologies Office, afdc.energy.gov/fuels/prices.html.

- **Limited Availability of Certified Service Centers and Technicians.** Without certified facilities and technicians, many fleet operators may be resistant to electrify their fleets until they can be assured that timely repairs can be made to their vehicles in order to protect against extended periods of downtime. Commercial vehicle fleets have very demanding operational requirements that require close monitoring to ensure optimal operational efficiency and minimal disruptions to fleet operations. While diesel trucks have a large network of highly capable and knowledgeable service centers and technicians to support their operation, this is not the case for heavy-duty electric vehicles.
- **Concerns with Grid Resiliency.** As electric truck fleets become more common, there is concern that without significant investments in utility upgrades to current grid infrastructure, local grid networks may be pushed beyond their current distribution capacity. This can create disruptions to services or a slowdown of fleet electrification efforts. Electric trucks have very high electrical demand requirements, and their widespread deployment would create large new demand for electricity. Evaluating the need for increasing grid distribution capacity is therefore essential to providing sufficient reliability to support a fully electrified freight transportation system.

Local initiatives to promote the adoption of electric vehicle technology are an opportunity for the CID, potentially in the form of a pilot program aimed at commercial vehicles. For instance, Georgia Power allows customers to apply for funding to assist in the installation of the infrastructure required to support electric transportation charging systems at their facilities.⁶⁶ This includes businesses that operate vehicle fleets, such as a motor carrier. In interviews for this study, Georgia Power expressed confidence that the electric grid in the region can be adapted to the expected new demand.

5.6 Transportation Data and Operational/Management Technologies

The intersection of technology innovation and transportation continues to influence freight movement. Technology advancements can be used to address freight transportation needs and issues; support future growth in freight volume and flow; improve freight mobility across all modes in terms of safety, efficiency, and reliability; and foster increased economic growth through reduced transportation cost and enhanced productivity. The trend of applying transportation data and operational/management technologies to freight transportation challenges will continue to persist as alternative improvements, such as large-scale capacity enhancements, can be costly and take much longer to implement.

There are multiple intelligent transportation system (ITS) technologies that may be applied to freight mobility. These include smart roadside and virtual weigh-in-motion (WIM) applications that allow for wireless roadside inspections, automated electronic clearance at roadside check facilities, and automated

⁶⁶ Georgia Power, Make Ready Electric Transportation Program, <https://www.georgiapower.com/business/products-programs/business-solutions/electric-transportation-business-programs.html>.

commercial vehicle safety inspections at roadside check locations. Examples of ITS technologies that are particularly relevant to the CID include the following:

- **Dynamic Route Guidance.** This ITS application provides advanced route planning and guidance that is responsive to current conditions. It includes technologies that incorporate real-time traffic and roadway conditions, allowing drivers to make re-routing decisions to a more optimal route. The INRIX Artificial Intelligence (AI) Traffic tool is an example of dynamic route guidance. It detects changes in road conditions and alerts drivers instantaneously via a mobile application. This application can be used to inform drivers about slowdowns, incidents, and weather conditions allowing them to make dynamic routing decisions.
- **Freight Signal Priority.** This application provides traffic signal priority for freight vehicles with the objectives of reducing delays, increasing travel time reliability, and improving safety at intersections. It includes vehicle-to-infrastructure (V2I) technologies that allow freight vehicle on-board equipment to communicate with traffic signal control equipment for the extension of green phases or other actions to enhance freight mobility and overall transportation safety. An example of this is SR 6/Thornton Road in Douglas and Cobb Counties. The project integrated roadway geometric and capacity improvements with freight ITS elements to create a truck friendly corridor. The technology elements included dilemma zone protection for trucks and traffic responsive signal timing based on sensing mix of vehicles and adjusting for heavy truck volumes.
- **Commercial Vehicle Parking.** This ITS application provides parking information to motor carriers both pre-trip and enroute. It is commonly referred to as a Truck Parking Information Management Systems (TPIMS). Parking availability information is collected from truck parking areas using technologies such as closed-circuit television (CCTV) cameras, in-ground sensors, above-ground radar, and side laser scanners. The raw data is processed and supplied to fleet managers, mobile devices used by commercial vehicle operators, to dynamic message signs (DMS) on the roadway, or directly to in-vehicle systems. The Florida DOT's Truck Parking Availability System (TPAS) is an example of this ITS application. The FDOT TPAS uses CCTV, microwave vehicle detection, and in-ground sensors in the truck spaces at interstate rest areas, welcome centers, and weigh stations to monitor the number of available truck parking spaces. That information is used to inform drivers of truck parking availability using the State's FL511 website and mobile application, third-party mobile applications, and roadside DMS.
- **Smart Work Zones.** Any construction on or adjacent to one of the CID's major corridors has the potential to limit mobility throughout the study area. This ITS application manages work zones by controlling traffic in areas of the roadway where maintenance, construction, and utility work activities are underway. Traffic conditions are monitored using CCTV cameras and controlled using field devices such as dynamic message signs (DMS), Highway Advisory Radio (HAR), and gates and barriers. Information on work zone speeds and delays are provided to the motorists prior to entering the work zones. In addition, this application can provide warnings to personnel within a work zone about potential hazards such as a vehicle moving in a manner that appears to create an unsafe condition (e.g., moving at high speed or entering the work zone).

Building on the trend of applying technology to freight transportation operational challenges, the cumulation of large datasets and their real-time application to operational decisions is also being leveraged as a tool

for improvement. In some technology applications, such as dynamic route guidance and freight signal priority, these datasets are key inputs to operational strategies. The Denver region's Enterprise Data Management Ecosystem (EDME) is an example application of using large, real-time datasets to meet freight transportation and other challenges. The EDME is a processing engine that gathers information from multiple disparate data sets (including sensors, detection devices, and other ITS field devices) for use by the various components that comprise the region's smart city program. The Intelligent Vehicles component of Denver's smart city program is particularly relevant to the CID. It includes the Freight Efficiency Corridor Program which uses dedicated short-range communications (DSRC) to improve freight travel time reliability along key truck corridors. This type of approach to improve freight mobility and safety could be deployed on SR 70/Fulton Industrial Boulevard and other major freight corridors in the study area.

5.7 Emerging Freight Trends Considerations for the CID Study Area

Some issues related to emerging freight trends to consider as recommendations are developed as part of Task 6 include the following:

- **E-Commerce and Urban Infill.** Areas like the Boulevard CID, which are proximate to both urban and suburban centers of demand for e-commerce goods, are desirable for fulfillment center and other e-commerce facilities. As the population density and economic activity of Metro Atlanta grows, so too will the demand for goods delivered via e-commerce channels; this will result in the continued demand for land and buildings in the CID that can be repurposed to meet this growing need. This highlights the importance of investments to not only support freight mobility, but also those to support employees that must access the CID.
 - **Advances in Supply Chain Operation and Design.** Trends in advances in supply chain operation and design are related to the trend in e-commerce and urban infill, especially warehouse automation. This is relevant for the CID as automation can result in a higher intensity use of a parcel (i.e., greater volumes of trucks and other vehicles), though the underlying land use has not changed. The increase in intensity is due to the ability of automated warehouses to increase throughput. As a result, the CID's transportation needs may evolve more quickly as this supply chain practice becomes more widespread.
 - **Connected and Autonomous Freight Vehicles.** Given the role played by SR 70/Fulton Industrial Boulevard as a regional freight corridor and the prevalence of freight-intensive land uses throughout the CID, a potential opportunity for the CID is to serve as a pilot site for the continued development of these technologies. This is supported by the 2020 Southern Fulton Comprehensive Transportation Plan which identified SR 70/Fulton Industrial Boulevard as one of a few "smart corridors" on which to focus innovative technology investments.
 - **Commercial Vehicle Electrification.** Commercial vehicle electrification is another trend that represents an opportunity as a pilot site for the CID. There are multiple businesses within the CID that operate fleets of commercial vehicles that operate over consistent ranges and working hours. These types of businesses are potentially ideal for commercial vehicle electrification. Ongoing
-

efforts by Georgia Power and other regional stakeholders to promote the adoption of this technology represent a partnership opportunity for the CID.

- **Transportation Operations Technologies.** Emerging technologies in the transportation operations field provide options for addressing the CID's freight transportation challenges, particularly as it relates to mobility and truck parking. ITS technologies such as dynamic route guidance and freight signal priority would help to improve travel time reliability on corridors such as SR 70/Fulton Industrial Boulevard. Commercial vehicle truck parking ITS technologies could help to alleviate staging and other parking challenges in the CID by providing motor carriers with advanced information on the availability of parking spaces and corridor travel times.

6 OPPORTUNITIES AND NEEDS ASSESSMENT

An assessment was conducted to identify opportunities and needs relative to the objectives of the Boulevard CID. This data-driven assessment relied primarily on the findings of the previous sections of this report (Inventory and Assessment). Stakeholder feedback will be considered further in Task 6 where specific solutions are developed. While emphasis was placed on identifying existing opportunities and needs, the assessment also considered deficiencies that are likely to arise in the coming decades from expected trends and changes in roadway infrastructure.

6.1 Capacity and Congestion

The reduction of roadway congestion and elimination of bottlenecks is a key objective of the Boulevard CID, as it makes trucking transportation more efficient and reliable, improving the competitiveness of local businesses. The analysis of roadway performance showed that truck congestion in the Boulevard CID concentrates at major intersections, including intersections that lead to on/off ramps to access the interstates. The metrics used to quantify truck congestion considered both where speeds slow down the most and where truck volumes are the highest. As expected, the highest truck volumes can be found along Fulton Industrial Boulevard, with volumes peaking on the intersection of this road with Camp Creek Parkway and also peaking on the stretch bounded by I-20 and Selig Drive. The other cross-streets with the highest truck volumes are:

- Westgate Parkway
- Great Southwest Parkway
- Phillip Lee Drive
- Wharton Drive
- Patton Drive
- Martin Luther King Jr. Drive
- Donald L. Hollowell Parkway

Within the CID, congestion was found to be the highest at the following locations:

- The intersection of Fulton Industrial Boulevard and Camp Creek Parkway, which accumulated the most congestion.
-

- The intersection of Fulton Industrial Boulevard and on/off ramps of I-20.
- The intersection of Fulton Industrial Boulevard and Martin Luther King Jr. Dr.

Outside of the study boundaries there are several locations that also generated significant congestion, which affects trucks heading to or coming from the Boulevard CID. This included:

- The intersection of Fulton Industrial Boulevard and Donald Lee Hollowell Parkway
- The intersection of Thornton Road and on/off ramps on I-20
- The intersection of Donald Lee Hollowell Parkway and on/off ramps on I-285 West

A traffic analysis will be conducted in Task 5 that evaluates the causes of congestion and makes recommendations for cost-effective solutions.

Several trends are likely to worsen congestion in the Boulevard CID over the coming decade:

- Growth of e-commerce and fulfillment activities in the CID (e.g. Amazon, UPS, etc.) will likely increase truck volumes considerably (GPS data show that the CID is already a hub for medium-duty truck trips throughout metro Atlanta region)
- Growth of population in surrounding neighborhoods, especially if high-density mixed-use developments are pursued
- Shift towards urban warehousing close to population concentrations (urban infill)
- Advances in supply chain design and warehousing automation that are increasing the intensity of freight activities at facilities (taller and faster warehouses), increasing truck volumes

6.2 Safety

Roadway safety is a key priority for the Boulevard CID, just like it is a priority for all planning agencies in metro Atlanta. Minimizing the frequency and severity of crashes is important not just because of the loss of life and property damage involved, but also because crashes are a key contributor to roadway congestion and unreliability. Unexpected slowdowns could lead trucks to miss their delivery windows, having downstream effects along the supply chain, including on production.

A crash in the Boulevard CID was found to be 450% more likely to involve a truck than elsewhere in Georgia. This reflects both the higher truck volumes in this area and higher crash risks. An analysis found that many roadways in the CID had higher crash rates than statewide averages for similar roads. This finding, combined with the high proportion of truck-involved crashes, suggests that mitigation measures are warranted to improve the safety of truck operations. The roads with higher crash rates than average were:

- I-20 in the CID Boundaries (31% higher than state average)
 - I-285 West in the CID Boundary (67% higher than state average)
 - Fulton Industrial Boulevard between Martin Luther King Jr. Dr. and I-20 (263% higher than state average)
 - Fulton Industrial Boulevard between I-20 to Mendel Dr./Wharton Dr. (48% higher than state average)
 - Fulton Industrial Boulevard between James Aldredge Blvd. to Camp Creek Pkwy (31% higher than state average)
 - Boat Rock Blvd. between Fulton Industrial Blvd. to western terminus (125% higher than state average)
 - Bolton Road between Donald L. Hollowell Pkwy and East Boundary of CID (20% higher than state average)
-

- Great Southwest Pkwy (240% higher than state average)

Pedestrian safety is also an area of concern for the Boulevard CID. From 2016 to 2020 there were 58 crashes involving a pedestrian within the CID, resulting in 13 fatalities. Most of these crashes and fatalities occurred on Fulton Industrial Boulevard, likely from transit users crossing this wide and high-speed road, sometimes not through designated pedestrian crossings. Several pedestrian crashes occurred on portions of Fulton Industrial Boulevard without signalized crossings (3.6 mile stretch between Camp Creek Parkway and Commerce Circle SW). Pedestrian safety issues were not found to be truck related, as trucks were only involved in 2 of the pedestrian crashes and they were non-fatal. The area of highest risk for pedestrian crashes is the 1.75-mile stretch of Fulton Industrial Boulevard from SR 139/Martin Luther King Jr. Drive and Mendel Drive/Wharton Drive, which accounted for 60 percent of pedestrian crashes.

Bike safety is also important, as some workers in the Boulevard CID use bikes to get from bus stops to their workplaces (although in outreach for this study, employers reported little bike activity). There were only 5 bike crashes from 2016 to 2020 and none of them involved trucks.

Safety issues were found influenced by:

- **Density of access points:** Along Fulton Industrial Boulevard there exists a high density of driveways and intersecting roads, which create multiple conflict points among vehicles and between vehicles with other users. As several of the CID's main corridors are already median-separated, other access management solutions should be explored such as driveway consolidation and inter-parcel access.
- **Roadway and intersection geometry:** Sideswipe same direction crashes accounted for a significant share of total crashes over the analysis period. As previously discussed, lane width and inadequate pavement markings are a common contributing factor to this type of crash. Potential mitigation solutions include widening lane widths where possible, re-striping corridors where pavement markings have become worn, and adding or replacing raised reflective pavement markers. Striping is also an aid to the lane-keeping technology increasingly common in automobiles and trucks.
- **Visibility:** The prevalence of truck traffic throughout the CID can limit the visibility of passenger vehicles that trail them in the traffic stream. At intersections, this can obscure a driver's visibility of a traffic signal and other vehicles, which can contribute to rear end and angle collisions. To improve visibility, some agencies use side-mounted signals in addition to overhead traffic signals. Visibility can also be improved with better lighting, signage and markings.

Specific projects that address these safety issues will be recommended in Task 6 of this study.

In the short-term, it is likely that advances in truck connectivity and driver aids have the potential to reduce truck involved crashes in the Boulevard CID. While likely, this has yet to be verified by national research on how these technologies are deployed and used in trucking. In the long-term, many opportunities exist for technology to improve truck safety.

6.3 Condition

The pavement condition on state routes (Fulton Industrial Boulevard and major cross-streets) was generally Good, as evidenced by the IRI measure. However, Poor or Fair pavement conditions were present on:

- The approaches to intersections, as frequent vehicle decelerations (especially trucks) affect pavements.

- Bolton Road on the eastern end of the Boulevard CID has Poor condition from Donald L. Hollowell Parkway to I-285 West.

The pavement condition on non-state routes ranged from Good to Poor according to the PSR measure, with no road rating as Very Poor. The roadways that rated Poor on this metric were:

- Robinson Drive
- Tradewater Parkway
- Kendall Park Lane

Several intersections in the study area were observed to have cracked curbs or off-road ruts, indicating these curbs are often mounted by turning trucks, which could signify a problem with the turning radii at these intersections. Most of the intersections with observed curb cracking or off-road rutting are along SR 70/Fulton Industrial Boulevard. One explanation for this phenomenon is that trucks turning onto local roads from SR 70/Fulton Industrial Boulevard are transitioning from a high speed onto a narrow road, resulting in a maneuver that may be difficult to complete without mounting the curb.

All 22 bridges in the Boulevard CID were found to have adequate load ratings of between 25 to 35 tons, and none had posted weight restrictions. Most of these bridges were also found to have adequate Sufficiency Ratings. The bridges with the lowest sufficiency ratings (between 60 to 70) were:

- Bolton Road bridge over I-285/Proctor Creek
- I-20 over SR 70/Fulton Industrial Boulevard, I-20 over the Chattahoochee River
- SR 70/Fulton Industrial Boulevard over Utoy Creek.

6.4 Truck Parking

There are two types of truck parking needs in the Boulevard CID:

- **Staging parking:** The need for truck drivers to meet delivery schedules leads them to park near their destination (industrial or commercial facilities). Some of these drivers will park at commercial truck parking facilities in and around the CID, but many of them find it cumbersome to find a space at these facilities and prefer to park in undesignated locations throughout the CID. Because of the lack of shoulders in the CID, this often involves parking on travel lanes. This dispersed type of parking represents a safety risk for all vehicles and can disrupt traffic operations. Field observation and an analysis of GPS data identified 23 locations in the Boulevard CID where undesignated truck parking is common, with 7 of these locations representing a clear safety issue for other vehicles. To reduce undesignated parking, a pilot program could be explored where industrial facilities provide accommodation for trucks arriving just before their delivery appointments. Some jurisdictions in the U.S. have implemented regulations requiring truck parking accommodation.
 - **Overnight parking:** Truck drivers must adhere to regulations around their rest requirements, which leads to a demand for long-term parking along major freight routes, often overnight. The availability of overnight parking was not a major concern in the Boulevard CID, as this general area of metro Atlanta was found to have the best availability of these types of spaces according to an analysis by the ARC. The largest truck parking facility in metro Atlanta, Petro travel center, is located just north east of the CID boundary, and there are several other public and commercial parking facilities in and around the CID.
-

The City of Atlanta has designated part of the Petro travel center parking as high-density commercial in their future land use maps. If implemented, this change could drastically reduce the availability of truck parking adjacent to the Boulevard CID, likely increasing undesignated parking.

6.5 ITS

Emerging technologies in the transportation operations field provide options for addressing the CID's freight transportation challenges, particularly as it relates to mobility and truck parking. ITS technologies such as dynamic route guidance and freight signal priority would help to improve travel time reliability on corridors such as SR 70/Fulton Industrial Boulevard. Much of the Fulton Industrial Boulevard has fiber optic cable connectivity that would allow for advanced signal coordination, particularly during peak hours of the day. The analysis of GPS data showed that truck activity peaks at different times than regular commuting peak hours. Advanced signal timing could consider these patterns, by type of truck, to facilitate certain types of truck moves, particularly at the start and end of tour shifts to supply the metro Atlanta region.

Commercial vehicle truck parking ITS in the main private parking facilities could help to alleviate staging and other parking challenges in the CID by providing motor carriers with advanced information on the availability of parking spaces and corridor travel times.

6.6 Land Use and Zoning

Presently, there do not exist major land use challenges in the Boulevard CID, with most of the land being zoned as industrial, limiting conflicts with incompatible land uses. However, there are two minor challenges that should be tracked and potentially addressed:

- **Incompatible land uses at boundary:** The CID is surrounded by predominantly single-family residential land uses. Incompatible land uses at the CID's boundaries can create challenges in the form of freight and non-freight vehicle conflicts along the study area's main corridors, such as SR 70/Fulton Industrial Boulevard, potentially increasing safety risks.
- **Lack of commercial services:** The CID currently offers limited commercial services and amenities such as restaurants. This affects both workers in the CID and nearby residents. This challenge is partially caused by the lack of commercial zoning in the CID.

Looking to the future, there are two major land use challenges that have the potential to have a significant impact on the Boulevard CID:

- **Rapid population growth:** Fulton County is expected to add over 462,000 residents by 2050 relative to 2015.⁶⁷ The areas surrounding the Boulevard CID are likely to share in that growth, implying more residents in its neighboring communities. This further implies growth in commuter traffic volumes as those residents use shared corridors with the CID (e.g., Cascade Road, SR 154 Campbellton Road, SR 70/Fulton Industrial Boulevard), creating additional conflicts with the CID's freight traffic. This growth is also likely to put pressure on land values and zoning within the CID. The population growth surrounding the CID, combined with the increase in e-commerce activity, make the CID an ideal location for fulfillment center facilities.
- **Conflicts with high-density commercial and mixed-use vision:** The long-term vision for high-density commercial and mixed-use future land uses at certain locations in or near the CID (e.g.,

⁶⁷ Atlanta Regional Commission, ARC Series 16 Forecast Dashboard, <https://33n.atlantaregional.com/arc-series-16-forecast>.

Bolton Road at the northern end of the CID, SR 8/US 78/US 278/Donald L. Hollowell Parkway at the northern end of the CID, Fulton County Airport) may create conflicts unless steps are taken to mitigate them. Potential mitigation steps could be taking action to preserve industrial land uses, creating buffer zones to separate industrial and non-industrial land uses, and operational strategies that work to separate freight and non-freight traffic on different corridors, among others.

6.7 Work Force Accessibility

The ability of businesses in the Boulevard CID to access a skilled and diverse work force is imperative to ensure competitiveness. This not only involves roadway access, but also transit, bicycle, and pedestrian connectivity. The following needs were identified in the Boulevard CID:

- **Transit service and quality:** There are currently 3 bus routes that cover most of the CID (especially areas of employment concentration) with headways of 20 to 65 minutes. Opportunities exist to expand this service to cover more areas of the CID (including south of the CID) and improve headways. Bus stop spacing is typical of the region, however rationalizing stop locations and improving bike-ped infrastructure could improve travel times and service. Field observation indicated that all bus stops could be improved along at least one of the following dimensions: shelters, benches, lighting, sidewalk connectivity, pedestrian crossing, signage and trash receptacles. Promotion of Georgia Commute Options within the CID encourage further transit use. A broader challenge not unique to the Boulevard CID is that the locations where employees live do not match up well with the availability of transit routes serving the CID.
 - **Limited bike and pedestrian infrastructure:** Most minor streets in the CID do not have sidewalks, and there are significant areas of the CID with no sidewalk connectivity. There are no bike lanes in the CID. There are nine signalized pedestrian crossings on the 12mile+ corridor of Fulton Industrial Boulevard, with the 3.6mile stretch between Camp Creek Parkway and Commerce Circle SW not having any. While it is unrealistic to expect the whole Boulevard CID area to be covered by an extensive pedestrian and bike network, steps should be taken to add links to the existing network that connect transit stops to major employers to commercial activities.
 - **Limited lighting:** The CID currently has limited lighting on existing sidewalks, including bus stops. This represents a safety and security risk at night.
-

7 CONCLUSION

Since its founding in 2010 and subsequent Master Plan, the Boulevard CID and its partners have made great strides in returning the district to preeminence. As the largest industrial corridor in the Southeast, this accomplishment has significance to the Atlanta metropolitan region, the State of Georgia, and to the nation. The CID's program has made a robust approach to safety a paramount objective, tackling crime and the conditions enabling it as well as vehicular and pedestrian hazards. This has been accompanied by improvements to the physical appearance of the landscape, associated branding, and upgrades to roadway conditions. The district's geographic location already is superb, situated at the edge of Atlanta's perimeter and interstate system, in ready range of Hartsfield International Airport, major rail intermodal terminals, and the city itself. The CID's improvements have mitigated detriments that could offset its attractions and allowed it to compete as a business location with new and established developments elsewhere. The fact that a world-class UPS facility and a spacious Amazon fulfillment center now sit at either end of the Fulton Industrial corridor speaks volumes to the success of the program. Even the historical issue of obsolescence among legacy buildings has receded, because the innate quality of the location has demonstrably overridden such concerns amidst the continuing surge in demand for e-commerce properties.

A competitive market position remains competitive through continuing investment in performance, access, facilities, technology and brand. The findings of this technical memorandum have determined a range of needs and opportunities through which this can be done, enabling the Boulevard CID to build on its strengths and prepare for the future. The next step is to establish recommendations and priorities for physical and policy initiatives based on these findings, and on inputs from the stakeholders of the district.



FREIGHT CLUSTER PLAN

Executive Summary

PROJECT OVERVIEW

The Fulton Industrial Boulevard Community Improvement District (Boulevard CID) Freight Cluster Plan (FCP) is a planning study led by the Boulevard CID and supported by the Atlanta Regional Commission (ARC) that focuses on freight movement in the Fulton Industrial District (FID). The purpose of the FCP is to assess existing and anticipated freight conditions and propose projects and policies to ensure the FID's continued economic prominence and competitiveness. As one of seven major freight clusters identified in ARC's 2016 Atlanta Regional Freight Mobility Plan Update, understanding and solving freight-related challenges in the FID is of major importance for the entire region.

The Boulevard CID was created in 2010 to enhance the economic vitality of the FID, the largest industrial corridor in the eastern United States. The FID is located ten miles west of downtown Atlanta, roughly bordered by the Chattahoochee River to the west, I-285 to the north, and SR 154/SR 166/Campbellton Road to the south, with SR 70/Fulton Industrial Boulevard acting as its spine. A majority of the industrial facilities in the FID are located on roads branching from this ten-mile stretch of SR 70/Fulton Industrial Boulevard. The FID's location provides unparalleled access to major transportation assets, including direct access to Interstates 285 and 20, the Fulton County Railway, and the Fulton County Airport. Additionally, the Hartsfield-Jackson Atlanta International Airport is located only nine miles from the FID, and two Class I railroads, CSX and Norfolk Southern, have nearby intermodal yards.

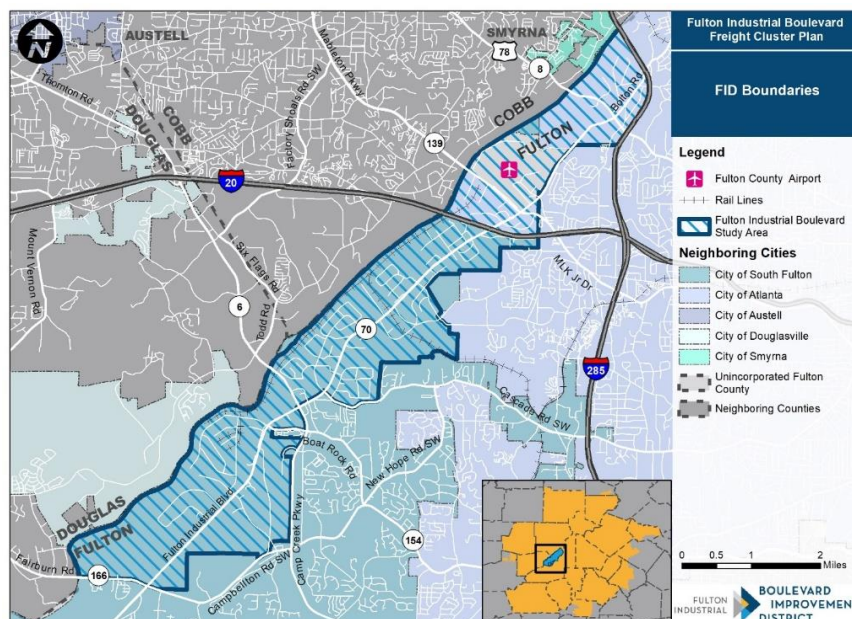
The FID has over **52 million square feet** of industrial space

More than **28,000 workers** are employed in over **1,000 businesses** in the FID

The FID generates **\$11 billion** of direct economic output annually

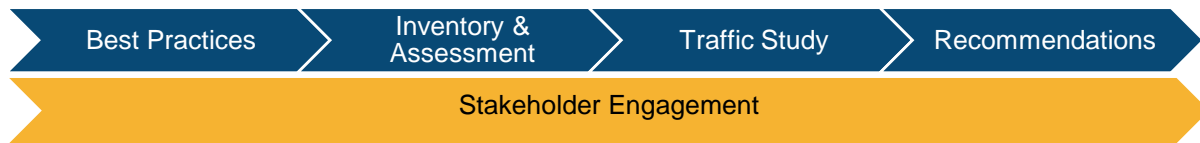
\$18 billion of metro Atlanta's Gross Regional Product can be traced back to the FID

Figure 1. Study Area



STUDY PROCESS

The process of developing this FCP consisted of a best practices review, an inventory and assessment of existing conditions, a traffic study, and the development of final recommendations. Throughout the entire process, the project team continuously engaged stakeholders and acquired feedback to ensure a comprehensive perspective on investment needs in the FID.



Stakeholder Engagement

The primary goal of the stakeholder outreach efforts for this project was to consult with local business members of the CID, the CID Board, and local and regional agencies to gather their ideas and support for transportation investments. This process relied heavily upon local knowledge and experience, and, as such, it was essential to target local businesses who engage in freight activities. This process also accounted for the CID's role in the region and sought input from regional partner agencies.

A Stakeholder Advisory Committee (SAC) of representatives from organizations located in or with vested interest in the FID was assembled to meet and give feedback on the FCP.

Stakeholder Advisory Committee

A project website was created to allow the public to keep up to date with the project. This website had information regarding the project timeline and upcoming events, project materials, and a way for users to provide input or ask questions to the project team.

Project Website

The project team undertook interviews with a number of stakeholders to understand the specific needs of industries, jurisdictions, and utilities operators within the FID.

Interviews

The project team attended multiple Quarterly CID Board of Directors meetings to present project updates and collect input.

Boulevard CID Board of Directors

The Regional Freight Advisory Task Force, established by the ARC, meets periodically throughout the year to provide a dialogue between the freight community and the public sector on freight and goods movement issues. The project team attended three Task Force meetings to give an update on the project and receive input.

Regional Freight Advisory Task Force

Key themes that arose from the stakeholder engagement activities included:

- ▶ Increased Traffic Congestion
- ▶ Increased Truck Traffic
- ▶ Truck Parking
- ▶ E-commerce Real Estate
- ▶ Electric Vehicle Infrastructure
- ▶ Public Transit Expansion
- ▶ Amenities for Employees (e.g. retail and restaurants)
- ▶ Pedestrian Facilities

Best Practices Review

The Best Practices Review examines existing notable practices in freight planning and assessed the degree to which data, tools, and processes meet the technical needs of the FID. The best practices review provides examples of freight planning efforts at the subregional level that have taken place across the country. The most effective efforts include a combination of technologies, policies, and operational and design approaches. Practices found to be most relevant to the FID were noted and used in developing the project recommendations where applicable.

Inventory and Assessment

The Inventory and Assessment Report presents a detailed picture of the existing conditions within the study area and an assessment of which areas should be improved to better support the freight network. The existing conditions analysis utilized INRIX Trip Path data products to determine spatial and temporal patterns of freight demand both on a regional and intra-district scale. Additional existing conditions analysis identified multi-modal infrastructure conditions throughout the FID, including roadways, bridges, transit stops, bike infrastructure, and sidewalks. Other key existing conditions included crash analyses by location, severity, and vehicle type, truck parking inventory, locations of Intelligent Transportation Systems (ITS) such as connected signals and work zone safety, job access, alternative fuel facilities, and land use and zoning patterns. The key findings from the Inventory and Assessment Report are described below.

Traffic Congestion

Within the FID, congestion is the highest at the intersection of SR 70/Fulton Industrial Boulevard and SR 6/Camp Creek Parkway, the intersection of SR 70/Fulton Industrial Boulevard and on/off ramps of I-20, and the intersection of SR 70/Fulton Industrial Boulevard and SR 139/Martin Luther King Jr. Drive. Truck congestion concentrates at the SR 6/Camp Creek Parkway intersection and along SR 70/Fulton Industrial Boulevard between I-20 and Selig Drive.

Several trends are likely to worsen congestion in the FID over the coming decade:

- ▶ Growth of e-commerce and fulfillment activities in the CID (like the over 1.1 million square foot Amazon fulfillment center that opened in 2020 along SR 154/SR 166/Campbellton Road, and the 1.2 million square foot high-speed UPS SMART Hub parcel processing facility opened in 2018) will likely increase truck volumes considerably.
- ▶ Growth of population in surrounding neighborhoods, especially if high-density mixed-use developments are pursued.
- ▶ A shift towards urban warehousing close to population concentrations (termed “urban infill”).

- ▶ Advances in supply chain design and warehousing automation that increase the intensity of freight activities per square foot at warehousing and fulfillment facilities, leading to increased truck volumes.

Truck Parking

Most truck parking issues within the FID are likely related to staging, which stems from the need of truck drivers to meet specific delivery and pickup timeframes. The most common instances of undesignated truck parking take place on driveways leading up to industrial facilities and on narrow roadway travel lanes. Parking in the driveways has a minimal effect on traffic movement; however, parking on the roadway in narrow travel lanes can cause traffic disruptions and potential safety risks as vehicles must shift into oncoming travel lanes to pass.

Figure 2. Undesignated Truck Parking



Safety

Crashes in the FID are 450 percent more likely to involve a truck than elsewhere in Georgia due to both higher truck volumes and higher crash risks. Crashes on major corridors in the study area account for 77 percent of truck-involved crashes and 75 percent of all other crashes within the FID from 2016 to 2020. During the same time period, 49 percent of crashes resulting in fatalities and incapacitating injuries occurred on SR 70/Fulton Industrial Boulevard. There are seven roadway segments in the FID with crash rates that exceed the statewide average.

Figure 3. Cracked Curb and Off-Road Rutting



Pavement Condition

Pavement conditions within the study area are generally good; locations with poor pavement condition are primarily located along Bolton Road and SR 70/Fulton Industrial Boulevard near major intersections and on several side streets, primarily in the southern portion of the FID.

Some intersections in the study area were observed to have cracked curbs or off-road ruts, indicating frequent mounting by turning trucks and the potential need for increased turning radii. Most instances of cracked curbs and/or off-road rutting are along SR 70/Fulton Industrial Boulevard.

Pedestrian/Bicycle Infrastructure

There are nine signalized pedestrian crossings with crosswalks along SR 70/Fulton Industrial Boulevard; sidewalks are discontinuous north of I-20 and south of Riverside Drive but are largely absent between Riverside Drive and I-20. There is no dedicated bicycle infrastructure within the study area.

Public Transit

There are three bus routes (73- Fulton Industrial, 50- Donald Lee Hollowell Parkway, and 850- Carroll Heights/Fairburn Heights) that provide transit service within the study area. There are 80 bus stops in the corridor, 28 percent of which have sidewalk connections, 13 percent of which have safe pedestrian crossings, and 21 percent of which have lighting.

Employees who work in the FID primarily reside in southern Fulton County, Douglas County, and southern Cobb County where they do not have access to transit service. The rate of employees who drive alone to work is five percent higher than the regional average.

Land Use

The majority of land within the FID is industrial and is predominantly surrounded by single-family residential land uses. This implies that while there are few incompatible land uses within the FID (e.g., a residential development surrounded by industrial parcels), incompatible land uses do exist at the FID's boundaries. This can create challenges in the form of freight and non-freight vehicle conflicts along the study area's main corridors.

Freight Trends and Changes

A number of trends and expected changes are impacting, or could potentially impact, drivers of freight demand and logistics patterns. These include the steady increase of the e-commerce industry, which has spurred development of high-cube warehouses – those with at least 200,000 gross square feet of floor area and a ceiling height of 24 feet or more – and urban infill in repurposed or rehabilitated industrial facilities.

Related to the trend of e-commerce and urban infill is the advancement of supply chain operations and design. Emerging trends in this area include warehouse automation, the use of big data and analytics for siting freight facilities (i.e., selecting an ideal location for meeting demand while meeting other objectives such as minimizing costs), and the Internet of Things.

The nature of truck fleets is gradually shifting as new vehicle technologies emerge; while much of the attention on connected and autonomous vehicle technology has focused on passenger cars, an increasing number of trucks are utilizing these technologies, encompassing sensors, communications, and/or processing software technologies for both steering and braking assistance. Freight vehicle electrification is another emerging trend that can reduce business costs and the overall environmental impact of the transportation sector. As a result, there will likely be forthcoming demand for electric grid expansion and high-capacity electric vehicle charging locations.

Finally, there are multiple ITS technologies that may be applied to freight mobility. These include smart roadside and virtual weigh-in-motion (WIM) applications that allow for wireless roadside inspections, automated electronic clearance at roadside check facilities, and automated commercial vehicle safety inspections at roadside check locations. Examples of ITS technologies that are particularly relevant to the CID include:

- ▶ Dynamic Route Guidance
- ▶ Freight Signal Priority
- ▶ Commercial Vehicle Parking
- ▶ Smart Work Zones

Traffic Study

The Traffic Study analyzed the existing and future conditions of the vehicular traffic in the study area. Traffic data was collected for 28 intersections in the FID and eight segments along SR 70/Fulton Industrial Boulevard and classified by type of vehicle. The Traffic Study evaluated the delay and level-of-service at each of these locations for current conditions and for conditions in the year 2031 using a 1.5 percent annual growth rate. Based on this analysis, the Traffic Study produced recommended improvement projects to address locations that are currently or will in the future be facing traffic congestion issues.

PROJECT PRIORITIZATION PROCESS

Project Identification and Screening

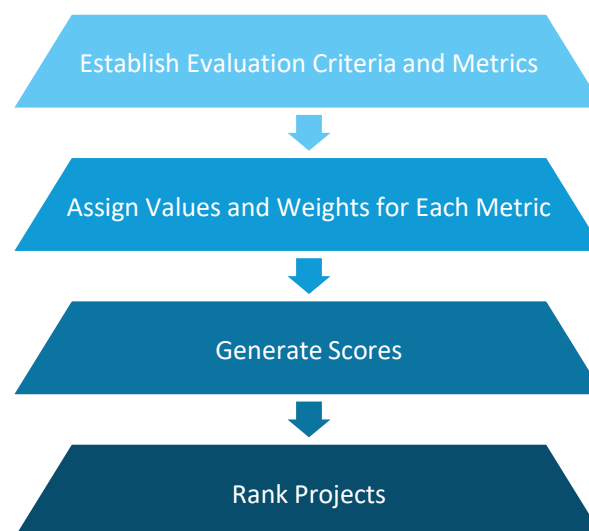
In order to establish a final list of recommendations for the Freight Cluster Plan, the project team first developed a list of all potential projects for the area, known as the Universe of Projects. These projects were identified through multiple avenues, including:

- ▶ Previously identified projects in plans at the local, regional, and state level
- ▶ The Inventory and Assessment Report
- ▶ The Traffic Study
- ▶ Stakeholder Input

The Universe of Projects was screened based on factors such as feasibility, necessity, and support from potential partners and the public. The screening process resulted in a list of 40 projects.

Project Evaluation and Prioritization

The project team took a location-based approach to project prioritization to help normalize the list of projects, which varied in terms of type and scale. Rather than using the metrics to directly evaluate each project, the district's roadway system was divided into sections and each section was evaluated. The team identified which sections were addressed by each project, and the sum of the scores of these segments determined the score for the project. Certain projects, such as policy-oriented projects, aren't associated with a specific physical location. These projects were scored solely on qualitative evaluation criteria, as described below.



To help establish metrics for evaluating projects, the team identified eight project categories of importance to the district, and developed evaluation criteria and metrics within each project category. The project categories are:

- | | |
|---------------------------------|---------------------------------|
| ▶ Access Management | ▶ Maintenance |
| ▶ Access to Jobs | ▶ Safety |
| ▶ Economic Development/Land Use | ▶ Smart Corridor/ITS Technology |
| ▶ Intersection Improvements | ▶ Transit |

The evaluation criteria were divided into quantitative and qualitative categories based whether or not their metrics were directly measurable. In addition to the eight project categories above, Public Input was included as a qualitative project category.

After finalizing the list of criteria and their associated metrics, the project team determined a range of values to measure how each location scored under each metric. The point system assigned higher scores to projects deemed to be the highest priority; as such, the values for each metric ranged from the highest value, corresponding to the worst condition under each metric, to the lowest value (usually zero), corresponding to the best condition under each metric.

During the third Stakeholder Advisory Committee meeting, attendees were asked to rank the project categories by level of priority. This input was then used to weigh each project category.

Table 1. Project Category Weight Assignments

Project Category	SAC Ranking	Score Weight (Out of 1)
Intersection Improvements	1 st	1
Safety	2 nd	0.90
Transit	3 rd	0.80
Access to Jobs	4 th	0.73
Access Management	5 th	0.68
Maintenance	6 th	0.56
Smart Corridor/ITS Technology	7 th	0.54
Economic Development/Land Use	8 th	0.50

As mentioned above, each segment of the project area and intersection with SR 70/Fulton Industrial Boulevard was given a value for each of the 17 metrics. Final project scores were determined by multiplying each criterion score by its associated weight, then summing the resulting values for each section or intersection addressed by the project in question. Subsequently, the projects were ranked based on their total score, with higher scores receiving a higher rank.

RECOMMENDATIONS

Based on the findings throughout the entire project, the FCP proposes 53 total recommendations to be conducted in the FID. These recommendations are in the form of both projects and policies that will benefit the FID and help maintain its economic competitiveness. These projects are divided into nine categories.



The recommendations are divided into timeframes for implementation based on prioritization results and anticipated revenue availability. The Financially Feasible Short-Term Action Plan includes projects that can be implemented within a 10-year timeframe and is based primarily on anticipated revenue for the Boulevard CID. It is further divided into projects with a timeframe of either one to five years or six to ten years. This Plan does not assume that the projects will be completed in these timeframes; rather, these projects can be started or at the very least funding can be secured for these projects in the timespan. The Long-Term Vision Recommendation List is fiscally unconstrained and includes projects that will be initiated past the 2031 horizon.

Table 2. Short-Term Action Plan (Years 1-5)

ID	Project Type	Project Name
FIB-1	Intersection Improvement	Intersection Improvement at Fulton Industrial Boulevard and Donald L. Hollowell Parkway
FIB-2	Intersection Improvement	Intersection and Operational Improvements at Fulton Industrial Boulevard and Westgate Parkway (North and South)
FIB-3	Intersection Improvement	Intersection Improvements at Fulton Industrial Boulevard and I-20 Ramps
FIB-4	Intersection Improvement	Intersection Improvements at Fulton Industrial Boulevard and Tradewater Parkway/Riverside Drive

ID	Project Type	Project Name
FIB-5	Intersection Improvement	Intersection Improvements at Fulton Industrial Boulevard and Westpark Place/Villanova Drive
FIB-6	Intersection Improvement	Intersection Improvements at Fulton Industrial Boulevard and Patton Drive
FIB-7	Intersection Improvement	Intersection Improvements at Fulton Industrial Boulevard and Martin Luther King Jr. Drive
FIB-8	Intersection Improvement	Intersection Improvements at Fulton Industrial Boulevard and Wendell Drive
FIB-9	Intersection Improvement	Intersection Improvements at Fulton Industrial Boulevard and Wharton Drive/Mendel Drive
FIB-10	Intersection Improvement	Intersection Improvements at Fulton Industrial Boulevard and Phillip Lee Drive
FIB-11	Intersection Improvement	Intersection Improvements at Fulton Industrial Boulevard and Eagle Vista Drive/Kendall Park Lane
FIB-12	Intersection Improvement	Intersection Improvements at Fulton Industrial Boulevard and James Aldredge Boulevard
FIB-13	Intersection Improvement	Intersection Improvements at Fulton Industrial Boulevard and Bucknell Drive
FIB-14	Intersection Improvement	Intersection Improvements at Fulton Industrial Boulevard and Marvin Miller Drive
FIB-15	Smart Corridor/ITS	Connected Vehicle Infrastructure on Fulton Industrial Boulevard
FIB-16	Smart Corridor/ITS	Smart Work Zones Adjacent to Major Roadway Projects
FIB-17	Pedestrian Safety/ Workforce Supportive	Pedestrian Infrastructure on Fulton Industrial Boulevard Between I-20 and Selig Drive
FIB-25	Transit	Extend Marta Bus Route 73 South to Campbellton Road
FIB-26	Transit	Pedestrian Crossings for MARTA Bus Route 73 Extension
FIB-27	Intersection Improvement	Supplemental Signal Heads on Fulton Industrial Boulevard
FIB-39	Economic Development/ Land Use	Gateway/Wayfinding Signage
FIB-56	Pedestrian Safety/ Workforce Supportive	Speed Limit Reduction on Fulton Industrial Boulevard
Policies		
FIB-34	Policy/Programming	Expand Electric Vehicle Charging
FIB-35	Policy/Programming	Emergency Procedures for Critically Vulnerable Transportation Assets
FIB-41	Policy/Programming	Branding to City Officials and Stakeholders
FIB-43	Policy/Programming	Participate in Regional Off-Peak Initiatives
FIB-44	Policy/Programming	Introduction of Amenities to Support Workforce
FIB-45	Policy/Programming	Encourage the Development of Ghost Kitchens in the FID
FIB-46	Policy/Programming	Sponsor Restaurant Events in the FID
FIB-47	Policy/Programming	Solar Panel Showcase
FIB-51	Policy/Programming	Commute Assistance Program
FIB-52	Policy/Programming	Carpool/Vanpool Programs
FIB-53	Policy/Programming	Discounted MARTA Passes

Table 3. Short-Term Action Plan (Years 6-10)

ID	Project Type	Project Name
FIB-18	Pedestrian Safety/ Workforce Supportive	Pedestrian Infrastructure on Fulton Industrial Boulevard Between Selig Drive and Camp Creek Parkway
FIB-19	Pedestrian Safety/ Workforce Supportive	Pedestrian Infrastructure on Fulton Industrial Boulevard Between Camp Creek Parkway and Tradewater Parkway/Riverside Drive
FIB-20	Pedestrian Safety/ Workforce Supportive	Pedestrian Infrastructure on Fulton Industrial Boulevard Between Tradewater Parkway/Riverside Drive and Campbellton Road
FIB-22	Pedestrian Safety/ Workforce Supportive	Pedestrian Infrastructure Connections to Employment Hubs Off of Fulton Industrial Boulevard
FIB-30	Smart Corridor/ITS	Truck Parking Wayfinding Signage

Table 4. Long-Term Vision Recommendation List

ID	Project Type	Project Name
FIB-21	Pedestrian Safety/ Workforce Supportive	Pedestrian Infrastructure on Fulton Industrial Boulevard Between I-285 and I-20
FIB-23	Pedestrian Safety/ Workforce Supportive	Pedestrian Infrastructure Connections to Fulton Industrial Boulevard
FIB-24	Pedestrian Safety/ Workforce Supportive	Pedestrian Infrastructure Connections to Fulton Industrial Boulevard
FIB-28	Intersection Improvement	Increase Intersection Turning Radii at Patton Drive and Mills Place
FIB-29	Intersection Improvement	Increase Intersection Turning Radius at Wendell Drive and Interchange Drive
FIB-31	Maintenance	Tradewater Parkway Resurfacing
FIB-32	Maintenance	Robinson Drive Resurfacing
FIB-33	Maintenance	Kendall Park Lane Resurfacing
FIB-36	Transit	Bus Stop Upgrades
FIB-38	Capacity/Widening	Truck Staging Lanes on Shoulder
FIB-54	Access Management	Connect Atlanta Industrial Way to Bolton Road
FIB-55	Capacity/Widening	Bus Pull-Out Lanes on Fulton Industrial Boulevard
FIB-57	Intersection Improvement	Intersection Realignment at Fulton Industrial Boulevard and Fulton Industrial Circle/Commerce Drive
Policies		
FIB-37	Policy/Programming	Driveway Consolidation Along Fulton Industrial Boulevard
FIB-40	Policy/Programming	Create a Sense of Place Around the Fulton County Airport
FIB-42	Policy/Programming	Identify Potential Locations for Truck Parking Facilities
FIB-48	Policy/Programming	Planning Considerations for Chattahoochee River Greenway, Proctor Creek Trail Extension, and Pedestrian Connections
FIB-49	Policy/Programming	Microtransit for Last-Mile Connections from Bus Stops
FIB-50	Policy/Programming	Micromobility for Last-Mile Connections from Bus Stops

IMPLEMENTATION

This plan, conducted through ARC's Freight Cluster Plan program, sets the framework for improvements in the area for years to come. The increase in freight traffic in the area, resulting from low vacancy rates and the addition of warehouse square footage, is putting pressure on the existing infrastructure of the FID and creating numerous challenges. The variety of project types is aimed at solving these challenges, ranging from projects that directly improve freight movement on roadways to policy changes that improve commuting experiences for employees in the area. Additionally, this Plan includes a number of projects that will introduce various new technologies to the area, thereby pushing the FID to the forefront of freight logistics.

The next step for the Boulevard CID is to meet with the City of South Fulton to review the project list and strategize a timeline for the projects they want to pursue. The Financially Feasible Short-Term Action Plan was created to help the Boulevard CID and its partners visualize a timeframe for projects in the FID and anticipate what is needed to move these projects from plan to construction. Meetings with other agencies, such as the City of Atlanta, GDOT, and Fulton County, are needed to secure funding and develop a strategy for delivery of project. And, as projects progress, it will be important to continually engage stakeholders and the public to receive input throughout the planning, design, and construction phases.

Funding Strategies

Project funding is a prerequisite for implementation, and some funding sources are more relevant to certain project types, scopes, and scales than others. The project team considered a range of funding opportunities to develop an implementation strategy for the FCP. While many recommendations may be funded by the CID in partnership with Atlanta and/or the City of South Fulton, there is a wide range of federal and state grant and financing opportunities that can heavily supplement local contributions. When identifying funding sources for a particular project, the CID can seek opportunities to leverage multiple funding sources, including partnerships with public and private agencies such as MARTA, the State Road and Tollway Authority (SRTA), GDOT, and ARC.





FREIGHT CLUSTER PLAN

Recommendations Report

CONTENTS

1	Introduction	4
1.1	Project Overview and Background	4
1.1.1	Goals & Objectives	5
1.1.2	Impact of COVID-19	6
1.2	Process Overview	6
1.2.1	Stakeholder Engagement	6
1.2.2	Best Practices	8
1.2.3	Inventory and Assessment	9
1.2.4	Traffic Study	15
1.2.5	Report Organization	17
2	Project Identification & Prioritization	18
2.1	Project Identification Overview	18
2.1.1	Inventory and Assessment	18
2.1.2	Traffic Study	18
2.1.3	Previously Identified Projects	18
2.1.4	Stakeholder Input	18
2.2	Phase 1: Screening	19
2.3	Phase 2: Prioritization	19
2.3.1	Establishing Evaluation Criteria and Metrics	19
2.3.2	Assigning Values and Weighing Metrics	21
2.3.3	Scoring and Ranking Projects	22
3	Funding Strategies	23
3.1	Overview	23
3.2	Potential Funding Sources	23
3.2.1	Federal Resources	24
3.2.2	State Resources	31
3.2.3	Locally Allocated Resources	33
3.2.4	Public-Private Partnerships	34
3.3	Revenue Forecasting	34
3.4	Competitive Projects for Grant or Formula Funding	35

3.4.1	Potentially Competitive Projects.....	35
4	Recommendations.....	48
4.1	Recommendation Categories.....	48
4.2	Suggested Funding Source and Potential Project Champion.....	50
4.3	Financially Feasible Short-Term Action Plan (Years 1-10).....	50
4.3.1	Short-Term Action Plan (Years 1-5).....	51
4.3.2	Short-Term Action Plan (Years 6-10).....	58
4.4	Long-Term Vision Recommendation List.....	61
5	Implementation Strategy.....	65

TABLES

Table 2-1.	Quantitative Evaluation Criteria and Metrics	20
Table 2-2.	Qualitative Evaluation Criteria	21
Table 2-3.	Sample Point Values for Scoring Metrics	21
Table 2-4.	Project Category Weight Assignments	21
Table 3-1.	Federal Funding Sources	25
Table 3-2.	Recommended Critical Urban Freight Corridors	29
Table 3-3.	State Funding Sources	31
Table 3-4.	Locally Allocated Funding Sources.....	33
Table 3-5.	CID Project Budget Forecast	34
Table 4-1.	Recommendations for Short-Term Action Plan Years 1-5	51
Table 4-2.	Recommendations for Short-Term Action Plan Years 6-10	58
Table 4-3.	Long-Term Vision Recommendation List	61

FIGURES

Figure 1-1.	Truck Trips Originating in the FID.....	4
Figure 1-2.	Study Area Overview	5
Figure 1-3.	Project Website Landing Page:	7
Figure 1-4.	Truck Volumes in the FID	10
Figure 1-5.	Undesignated Truck Parking on Westlake Parkway	11

Figure 1-6. Curb Rutting at Patton Drive/Mills Place (Left) and Curb Cracking at Wendell Drive/Interchange Drive (Right)	12
Figure 1-7. Roadways in the FID with Crash Rates Above State Average	13
Figure 1-8. Level of Service Definitions	16
Figure 2-1. Overview of Prioritization Process.....	19
Figure 3-1. Recommended Critical Urban Freight Corridors	30
Figure 3-2. Proposed Streetscape Improvements at Fulton Industrial Boulevard and Donald L. Hollowell Parkway.....	36
Figure 3-3. Location Map of Proposed Intersection Improvements along Fulton Industrial Boulevard	42
Figure 3-4. Proposed Improvements at the Tradewater Parkway/Riverside Drive Intersection (FIB-1.1) ..	43
Figure 3-5. Proposed Improvements at the Patton Drive Intersection (FIB-1.3)	43
Figure 3-6. Proposed Improvements at the Martin Luther King Jr. Drive Intersection (FIB-1.4)	44
Figure 3-7. Proposed Improvements at the Wendell Drive Intersection (FIB-1.5).....	44
Figure 3-8. Example Section of Proposed Pedestrian Infrastructure on Fulton Industrial Boulevard at Villanova Drive/Westpark Place (Part of FIB-7B)	47
Figure 3-9. Proposed RCUT and Signal at Westgate Parkway North and South	Error! Bookmark not defined.
Figure 4-1. Project Recommendation Categories and Breakdown	49
Figure 4-2. Short-Term Action Plan Projects for Years 1-5	57
Figure 4-3. Short-Term Action Plan Projects for Years 6-10	60
Figure 4-4. Long-Term Vision Intersection Improvement, Pedestrian Safety/Workforce Supportive, and Maintenance Projects.....	64

APPENDICES

Appendix A. Potential Funding Matrix

Appendix B. Project Sheets

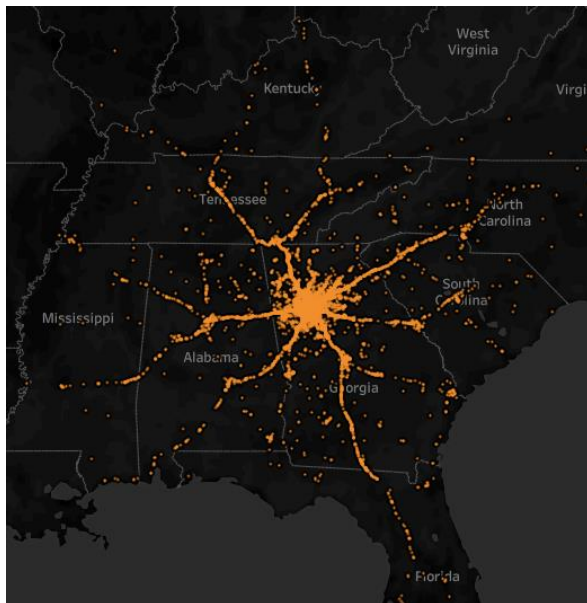
Appendix C. Scoring Matrix

1 INTRODUCTION

1.1 Project Overview and Background

The Fulton Industrial District (FID, or District), which follows the boundaries of the Fulton Industrial Boulevard Community Improvement District (Boulevard CID) and is the study area for this plan. The FID is the largest industrial corridor in the eastern United States with over 52 million square feet of existing industrial space. Vacancy rates are currently at historic lows. The FID is a major contributor to the regional Atlanta economy; there are more than 28,000 workers directly employed in over 1,000 businesses in the area with an average salary of \$81,000. The FID generates \$11 billion of direct economic output annually.

Figure 1-1. Truck Trips Originating in the FID



Source: Consultant analysis of INRIX Data

Including additional business indirectly triggered by activity within the FID, \$18 billion of metro Atlanta's Gross Regional Product can be traced back to the FID.

The success of the FID can be attributed, in large part, to its excellent location and unparalleled access to transportation assets. The District has direct access to Interstate 20 and is near Interstate 285, is nine miles from Hartsfield-Jackson Atlanta International Airport, is ten miles from downtown Atlanta, has on-site rail access, and is proximate to two rail intermodal yards operated by Class I railroads, CSX and Norfolk Southern. **Figure 1-1** shows the regional distribution of truck trips that originate in the FID, demonstrating its service across the U.S. Southeast.

The Boulevard CID was created in 2010. It is dedicated to enhancing the economic vitality of the Fulton Industrial District through investments in transportation infrastructure improvement, public safety, and

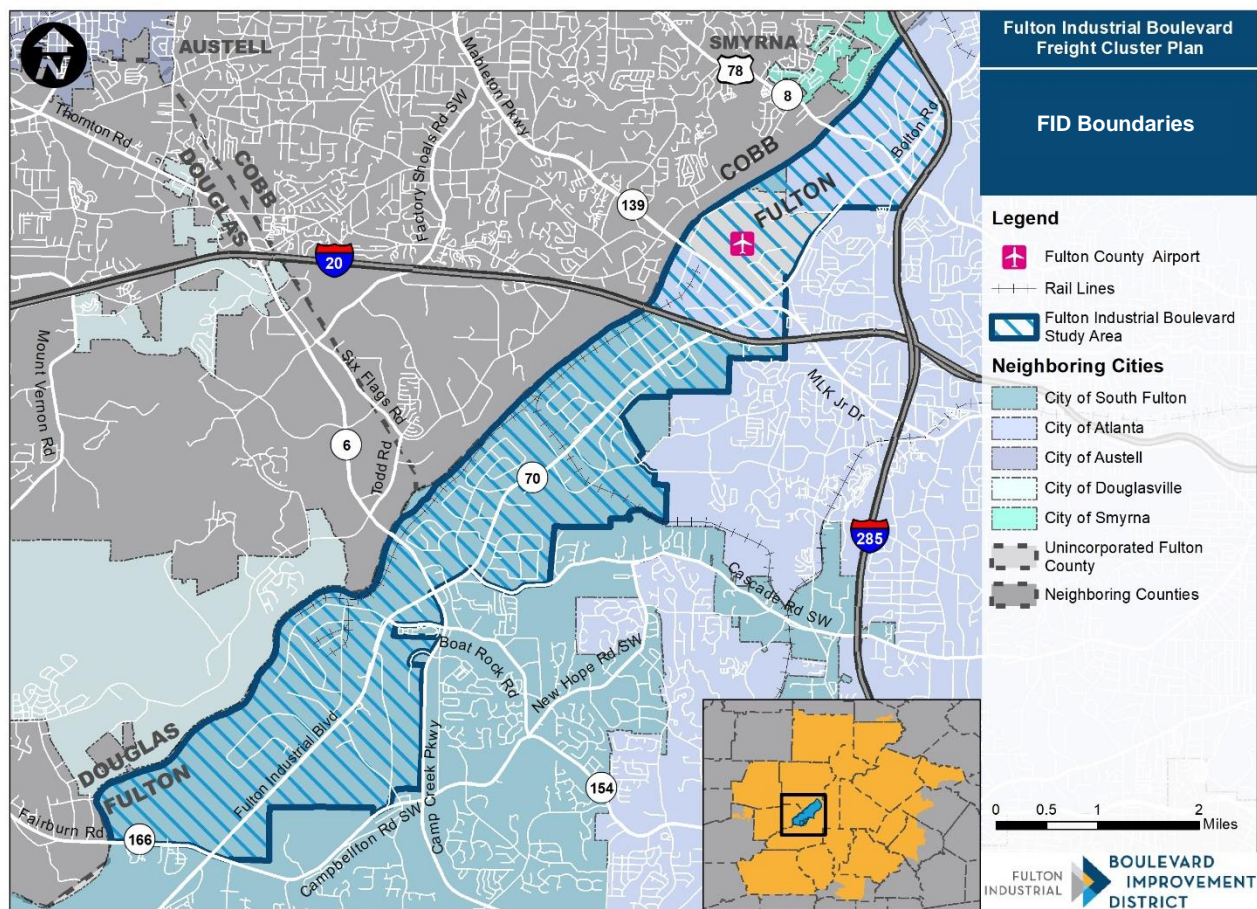
landscaping and beautification. The Boulevard CID completed its first Master Plan in 2013 in partnership with the Atlanta Regional Commission (ARC) through a first of its kind innovation Grant. The Master Plan has been the source for the CID's work program for the past 5+ years.

A number of changes have occurred since 2013 prompting the need for the Freight Cluster Plan. The Boulevard CID boundary has expanded to the north, adding new properties near the intersection of SR 8/US 78/US 278/Donald L. Hollowell Parkway and SR 70/Fulton Industrial Boulevard, including the new UPS SMART hub. On the southern end of the District, a new 1.1 million square foot Amazon distribution center is indicative of the e-commerce boom driving demand for fresh or repurposed FID facilities. The City of South Fulton recently incorporated the entirety of the FID south of I-20 and currently there are several new greenfield developments which will add millions of industrial square feet to the southern portions of the District around Riverside Drive, SR 154/SR 166/Campbellton Road, and SR 70/Fulton Industrial Boulevard.

This Freight Cluster Plan assesses existing and anticipated freight conditions and proposes projects and policies that aim to ensure the FID's continued economic prominence and competitiveness. Recommendations include upgrades to the transportation system that maintain and enhance efficient freight movement, improve multimodal employment access, and address safety issues. Coordination with the regional planning process helped to ensure that the plan is based on both regional goals and sound technical analysis. This document defines transportation goals and project priorities and will become the basis for a future CID transportation work program, guiding activities for the near- and mid-term future.

Figure 1-2 shows the study area for this plan, which encompasses the FID, located within the City of South Fulton, the City of Atlanta, and a small portion of unincorporated Fulton County. The study area includes property on both sides of SR 70/Fulton Industrial Boulevard from SR 154/SR 166/Campbellton Road in the south to I-285 in the north. The western border of the study area is the Chattahoochee River.

Figure 1-2. Study Area Overview



Source: ARC

1.1.1 Goals & Objectives

The primary goal of this Freight Cluster Plan is to ensure that the FID maintains economic competitiveness as a local and regional industrial center through upgrades to the transportation system. System

improvements will enhance freight movement efficiency, improve multimodal employee access, address safety issues, and heighten the attractiveness of the FID for business location and job creation.

The objective of this plan is to study freight movements within the study area to address infrastructure conditions and needs, assess dependencies on current facilities, and anticipate future needs related to safety, traffic congestion, and intermodal access. Major topics for analysis include truck parking availability, multimodal job accessibility options for employees, travel conditions on designated truck routes, intersection capacity, safety, and the area's appeal to employers, workers, and communities in respect to aesthetics and amenities.

1.1.2 Impact of COVID-19

The COVID-19 pandemic has had a major impact around the world, creating uncertainty and disrupting the status quo of most industries, especially the freight industry. As a result of individuals limiting their time out of the house, e-commerce demand significantly increased in 2020, accelerating an already rapidly-growing sector. It is likely that the e-commerce sector will retain a significant portion of its market share and grow now from a greater base, so the resulting trends, such as increased demand for warehouses that allow for rapid deliveries, are likely to continue and become more prevalent in the FID. This trend is further discussed in Section 1.2.3.

The pandemic also affected the development of the Freight Cluster Plan – specifically how the project team collected feedback from stakeholders. Stakeholder engagement was conducted virtually throughout much of the project. The project team was able to successfully engage with numerous stakeholders and receive meaningful input through virtual video meetings and other online engagement tools, such as the Mentimeter polling software, which allowed for real-time feedback during these meetings. When possible, the project team provided in-person presentations and engaged in subsequent discussions with the CID Board of Directors. In-person meetings occurred three times throughout the project.

1.2 Process Overview

The planning process for this Freight Cluster Plan included several key tasks:

- ▶ Stakeholder Engagement
- ▶ Best Practices Review
- ▶ Existing Conditions Inventory and Assessment
- ▶ Traffic Study
- ▶ Recommendations Development

While these tasks were largely sequential, Stakeholder Engagement took place throughout the planning process in the form of meetings, interviews, and presentations.

1.2.1 Stakeholder Engagement

The primary goal of the stakeholder outreach efforts for this project was to consult with local business members of the CID, the CID Board, and local and regional agencies and officials to gather their ideas and support for transportation investments. This process relied heavily upon local knowledge and experience,

and, as such, it was essential to target local businesses who engage in freight activities. This process also accounted for the CID's role in the region and sought input from regional partner agencies.

Stakeholder Advisory Committee (SAC)

A group of stakeholders was contacted to voluntarily give input and feedback to the project team as part of the Stakeholder Advisory Committee (SAC). Organizations that were located in or have some vested interest in the FID were chosen to be part of the SAC. Organizations represented in the SAC included a number of companies with locations in the FID, City of South Fulton, City of Atlanta, City of Atlanta Department of Transportation (ATLDOT), Georgia Department of Transportation (GDOT), Fulton County, Cobb County, Douglas County, ARC, and the CID Board of Directors. The SAC met three times during the planning process, on March 31, May 25, and August 25, 2021. Each meeting consisted of a project update, presentation of new data/findings, and a feedback session where SAC members could give input and ask questions.

Project Website

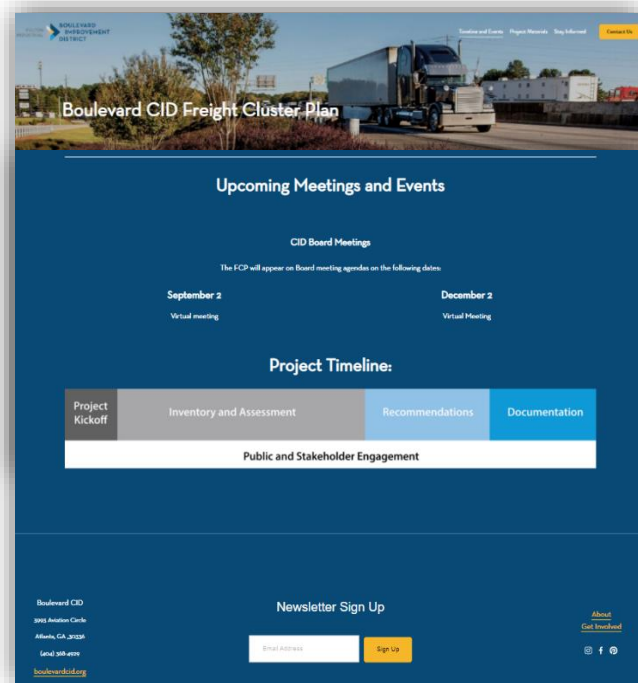
A project website allowed the public to keep up to date with the project's progress. This website was linked to the Boulevard CID's main website and had information regarding the project timeline/upcoming events and a webpage with project materials, including technical memoranda and SAC meeting PowerPoint presentations (see [Figure 1-3](#)). Additionally, users could contact the project team through the website to provide input or ask questions. Information from this website will remain available after completion of the Freight Cluster Plan through the Boulevard CID website.

Interviews

The project team undertook interviews with a number of stakeholders to understand the specific needs of industries, jurisdictions, and utilities operators within the District.

- ▶ March 10, 2021 interview with **Prologis** to discuss industrial/warehousing development and leasing with conversation about e-commerce real estate, infrastructure, employee needs.
- ▶ March 12, 2021 interview with Adjunct Principal Research Scientist with **Georgia Tech's Transportation Systems Engineering** department about Electric Vehicles.

Figure 1-3. Project Website Landing Page:
www.boulevardfreightplan.squarespace.com



Source: Boulevard CID Project Website

- ▶ March 12, 2021 interview with **Georgia Power** to discuss community development and research with a focus on development trends and Electric Vehicle infrastructure in the District.
- ▶ March 15, 2021 interview with **Averitt Express** to talk about logistics and delivery companies' needs and challenges.
- ▶ March 16, 2021 interview with **UPS** public relations and engineering about the transit and intersection improvements surrounding the UPS facility as well as the lack of nearby amenities and retail.
- ▶ March 22, 2021 interview with **Trust for Public Lands** and **Atlanta Regional Commission** regarding the Chattahoochee RiverLands plan for land conservation along the Chattahoochee River.
- ▶ June 18, 2021 interview with **Omnitrac** (owned by Broe Group, short line rail operator and real estate company) to discuss development opportunities in the District near the existing Omnitrac rail line.
- ▶ July 27, 2021 interview with the **City of South Fulton** Assistant City Manager and Councilwoman to discuss a general vision for the future role of the District.

Boulevard CID Board of Directors

The project team attended five Quarterly CID Board of Directors meetings on September 2 and December 3, 2020, and on April 1, September 2, and December 2, 2021. In these meetings, the project team presented a project update to the Board and collected input from attendees, which was used to help develop the Freight Cluster Plan.

Regional Freight Advisory Task Force

ARC established the Regional Freight Advisory Task Force in 2003 to provide “a forum of dialogue between the freight community and the public sector on freight and goods movement issues”. The Task Force meets periodically throughout the year, and includes representatives from various sectors including railroad, trucking, airport, Chambers of Commerce, and CIDs. The project team presented at three Task Force meetings on January 20, August 18, and December 15, 2021. The team gave an update on the status of the project and received input from Task Force members on various aspects of the Freight Cluster Plan.

1.2.2 Best Practices

The Best Practices Technical Memorandum examines existing notable practices in freight planning and assesses the degree to which data, tools, and processes meet the technical needs of the FID. The best practices review provides examples of freight planning efforts at the subregional level that have taken place across the country. The most effective efforts will include a combination of technologies, policies, and operational and design approaches. Practices found to be most relevant to the FID are outlined by category below.

Transportation Condition and Performance:

- ▶ **Freight-focused safety analyses.** Include analyses of crashes involving trucks and incorporate analysis of where truck parking needs are a factor of safety challenges.

- ▶ **Freight-focused travel time and congestion analyses.** Analyze levels of service and travel times using truck probe data to highlight the corridors that are important for freight mobility. These corridors may not receive the same attention in a general vehicle analysis as corridors that carry large volumes of both freight and commuter traffic.
- ▶ **Freight asset condition analysis.** Devote attention to the condition of freight assets, particularly pavement and bridge conditions on freight corridors.
- ▶ **Scenario planning for freight.** Develop scenarios for growth in freight activity and/or changes to external factors impacting freight at the cluster level.

Land Use:

- ▶ **Zoning to mitigate freight impacts.** Use zoning regulations to regulate how new developments interact with the public right-of-way and to create buffers between industrial and non-industrial land uses.
- ▶ **Zoning to preserve freight-intensive land uses.** Use tools like overlay districts and performance-based zoning codes to facilitate land development for freight-intensive uses.

Truck Parking and Staging:

- ▶ **Truck Parking Technologies.** Use Intelligent Transportation Systems (ITS) technologies to improve utilization and efficiency of truck parking by providing real-time information on the location and quantity of available truck parking.
- ▶ **Public-private partnerships for truck parking.** Use public-private partnerships to increase the supply of truck parking.
- ▶ **Public truck parking.** Provide public truck parking beyond traditional locations and develop ordinances codifying the allowance of overnight truck parking on specific city streets.

Stakeholder Engagement:

- ▶ **Stakeholder Outreach.** Include stakeholders in the process of identifying and prioritizing investments.

1.2.3 Inventory and Assessment

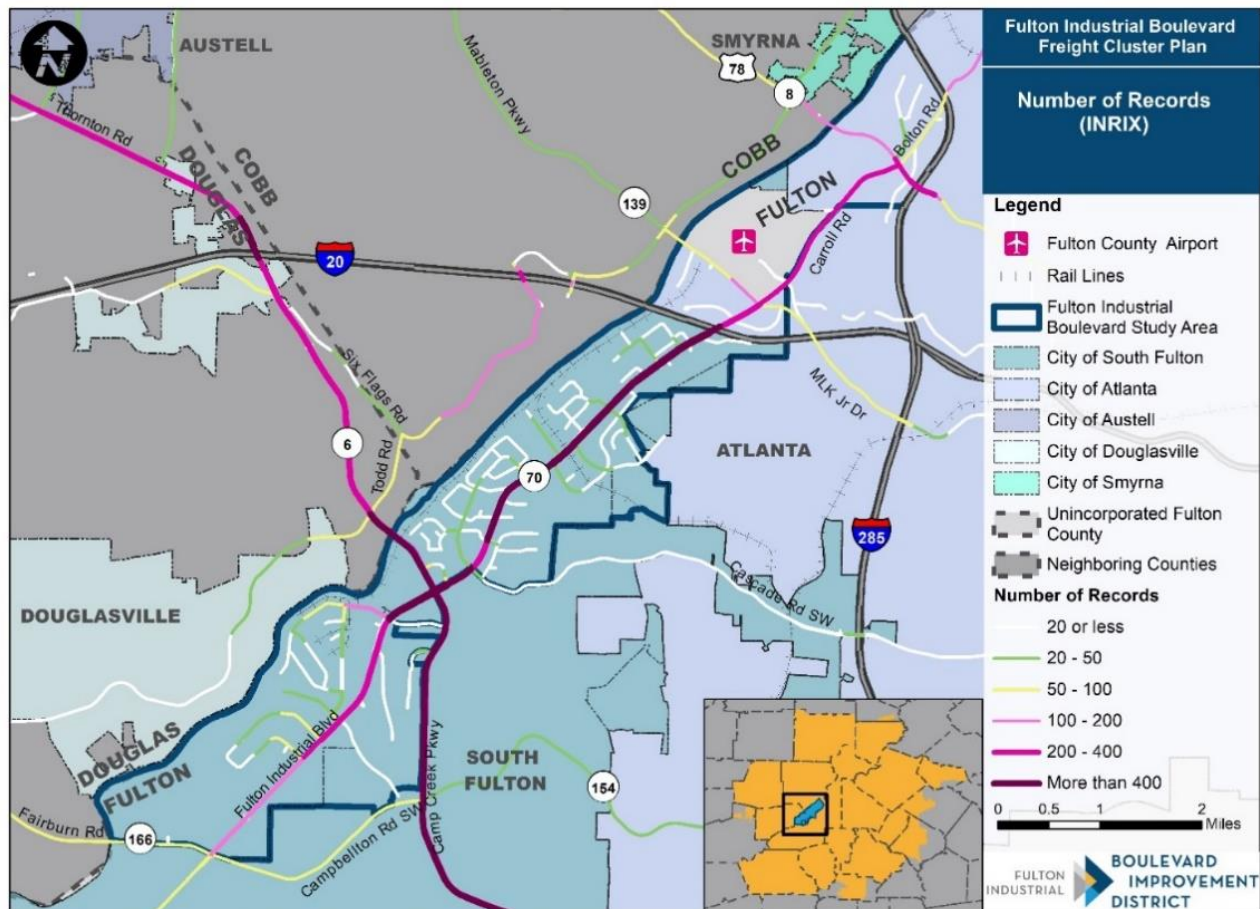
The Inventory and Assessment Report presents a detailed picture of the existing conditions within the study area and an assessment of which areas should be improved to better support the freight network. The existing conditions analysis utilized INRIX Trip Path data products to determine spatial and temporal patterns of freight demand both on a regional and intra-district scale. This database is a powerful tool that describes trucking demand patterns at a level of detail not previously available by connecting trip-level information with route-level detail. The INRIX Trip Path data allowed this study to track how over 1 million trucks that operate in the FID made over 2.5 million trips throughout the Atlanta region and beyond over a six-month, pre-pandemic period in 2019. Additional existing conditions analysis identified multi-modal infrastructure conditions throughout the District, including roadways, bridges, transit stops, bike infrastructure, and sidewalks. Other key existing conditions included crash analyses by location, severity, and vehicle type, truck parking inventory (through both INRIX data and field observation), locations of ITS

such as connected signals and work zone safety, job access, alternative fuel facilities, and land use and zoning patterns.

Key findings from the Inventory and Assessment Report include:

- ▶ Truck congestion in the FID concentrates at major intersections, among them intersections that lead to on/off ramps to access the interstates. The highest truck volumes can be found along SR 70/Fulton Industrial Boulevard, with volumes peaking on the intersection of this road with SR 6/Camp Creek Parkway and also peaking on the stretch bounded by I-20 and Selig Drive. The other cross-streets with the highest truck volumes are Westgate Parkway, Great Southwest Parkway, Phillip Lee Drive, Wharton Drive, Patton Drive, SR 139/Martin Luther King Jr. Drive, and Donald L. Hollowell Parkway.
- ▶ Within the FID, congestion is the highest at the intersection of SR 70/Fulton Industrial Boulevard and SR 6/Camp Creek Parkway, the intersection of SR 70/Fulton Industrial Boulevard and on/off ramps of I-20, and the intersection of SR 70/Fulton Industrial Boulevard and SR 139/Martin Luther King Jr. Drive (see [Figure 1-4](#)).

Figure 1-4. Truck Volumes in the FID



Source: Consultant analysis of INRIX Data

- ▶ Several trends are likely to worsen congestion in the FID over the coming decade:
 - 1) Growth of e-commerce and fulfillment activities in the CID, such as the over 1.1 million square foot Amazon fulfillment center that opened in 2020 along SR 154/SR 166/Campbellton Road and the 1.2 million square foot UPS SMART Hub parcel processing facility that opened in 2018, will likely increase truck volumes considerably.
 - 2) Growth of population in surrounding neighborhoods, especially if high-density mixed-use developments are pursued.
 - 3) A shift towards urban warehousing close to population concentrations (termed “urban infill”).
 - 4) Advances in supply chain design and warehousing automation that increase the intensity of freight activities per square foot at warehousing and fulfillment facilities, leading to increased truck volumes.
- ▶ Most truck parking issues within the FID are likely related to staging, which stems from the need of truck drivers to meet specific delivery and pickup timeframes. The most common instances of undesignated truck parking take place on driveways leading up to industrial facilities and on narrow roadway travel lanes. Parking in the driveways has a minimal effect on traffic movement; however, parking on the roadway in narrow travel lanes can cause traffic disruptions and potential safety risks as vehicles must shift into oncoming travel lanes to pass (see [Figure 1-5](#)).

Figure 1-5. Undesignated Truck Parking on Westlake Parkway



Source: Consultant Field Observation

- ▶ Pavement conditions within the study area are generally good; locations with poor pavement condition are primarily located along Bolton Road and SR 70/Fulton Industrial Boulevard near major intersections and on several side streets, primarily in the southern portion of the FID.
- ▶ Some intersections in the study area were observed to have cracked curbs or off-road ruts, indicating frequent mounting by turning trucks and the potential need for increased turning radii. Most instances of cracked curbs and/or off-road rutting are along SR 70/Fulton Industrial Boulevard (see [Figure 1-6](#)).

- ▶ Crashes in the FID are 450 percent more likely to involve a truck than elsewhere in Georgia due to both higher truck volumes and higher crash risks. Crashes on major corridors in the study area (SR 70/Fulton Industrial Boulevard, I-285, and SR 8/US 78/US 278/Donald L. Hollowell Parkway) account for 77 percent of truck-involved crashes and 75 percent of all other crashes within the FID from 2016 to 2020. During the same time period, 49 percent of crashes resulting in fatalities and incapacitating injuries occurred on SR 70/Fulton Industrial Boulevard.

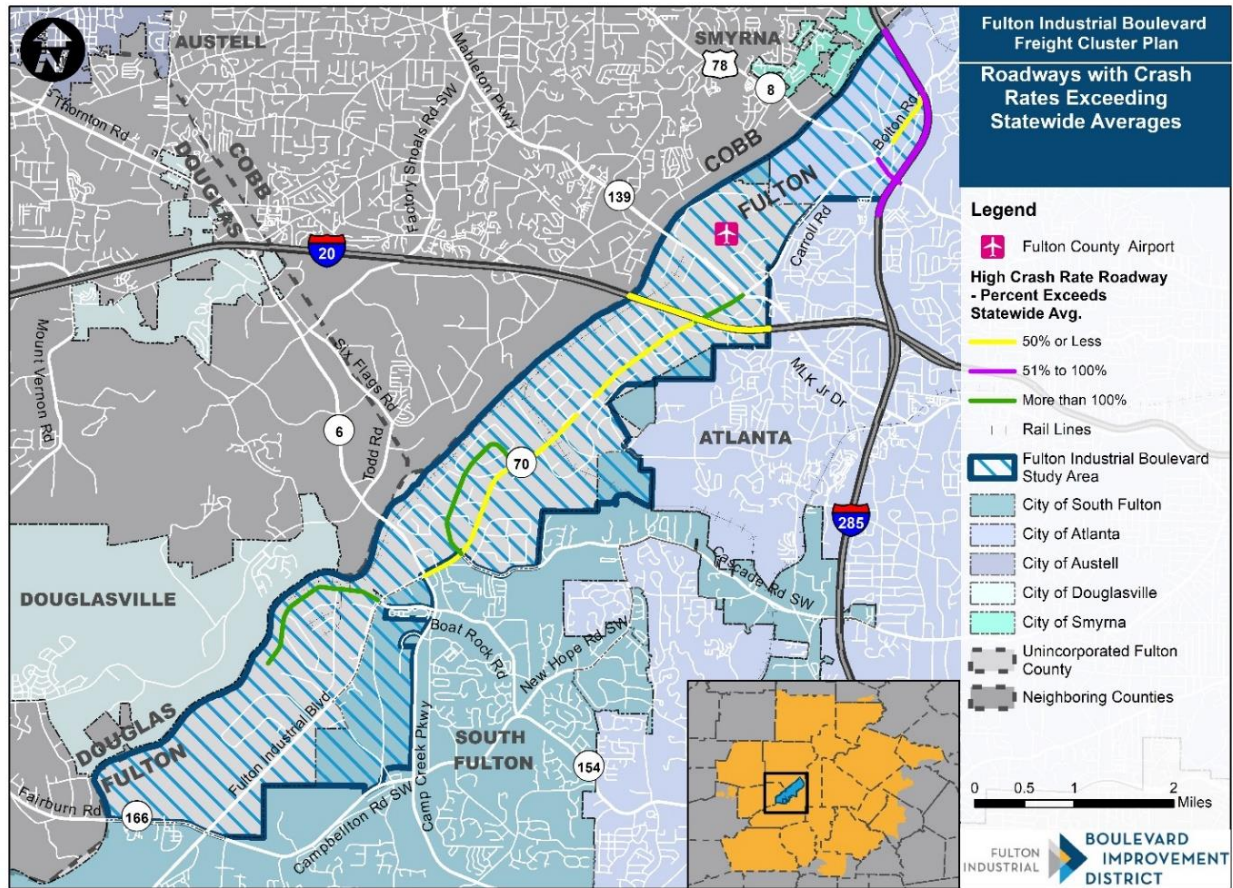
Figure 1-6. Curb Rutting at Patton Drive/Mills Place (Left) and Curb Cracking at Wendell Drive/Interchange Drive (Right)



Source: Consultant Field Observation

- ▶ Roadways with crash rates that exceed the statewide average include I-20 within the FID boundaries, I-285 West within the FID boundary, SR 70/Fulton Industrial Boulevard between I-20 and Mendel Drive/Wharton Drive, SR 70/Fulton Industrial Boulevard between James Aldredge Boulevard and SR 6/Camp Creek Parkway, Boat Rock Boulevard between SR 70/Fulton Industrial Boulevard and the western terminus, Bolton Road between SR 8/US 78/US 278/Donald L. Hollowell Parkway and the east boundary of the FID, and Great Southwest Parkway (see [Figure 1-7](#)).

Figure 1-7. Roadways in the FID with Crash Rates Above State Average



Source: GDOT Crash Reporting Office; GDOT Road & Traffic Data; Consultant analysis

- ▶ A 96-single mode fiber optic cable is installed along the Fulton Industrial Boulevard corridor from Boat Rock Road to the UPS driveway south of SR 8/US 78/US 278/Donald L. Hollowell Parkway.
- ▶ The study area is served by the Fulton County Railway, a Class III railroad owned and operated by Omnitrac that interchanges with the Class 1 railroad CSX and handles approximately 11,500 carloads per year. The railway provides direct service to over 40 customers within the study area; among the chief commodities are food and beverage products, building materials, consumer goods, and paper and plastics.
- ▶ There are three bus routes (73- Fulton Industrial, 50- Donald Lee Hollowell Parkway, and 850- Carroll Heights/Fairburn Heights) that provide transit service within the study area. There are 80 bus stops in the corridor, 28 percent of which have sidewalk connections, 13 percent of which have safe pedestrian crossings, and 21 percent of which have lighting.
- ▶ There are nine signalized pedestrian crossings with crosswalks along SR 70/Fulton Industrial Boulevard; sidewalks are discontinuous north of I-20 and south of Riverside Drive but are largely absent between Riverside Drive and I-20. There is no bicycle infrastructure within the study area.

- ▶ Employees who work in the FID primarily live in southern Fulton County, Douglas County, and southern Cobb County where they do not have access to transit service. According to US Census data, the rate of employees who drive alone to work is five percent higher than the regional average (83 versus 78 percent).
- ▶ The majority of land within the FID is industrial and is largely buffered from residential land uses by the Chattahoochee River, vacant land, and wide roads and highways. The District functions vertically (up and down Fulton Industrial Boulevard) and coexists with nearby residential areas. Still, residential neighborhoods surround the industrial area and can create challenges in the form of freight and non-freight vehicle conflicts along the study area's main corridors.

The Inventory and Assessment Report also discusses trends and expected changes that are impacting, or could potentially impact, drivers of freight demand and logistics patterns. These include the steady increase of the e-commerce industry, which has spurred development of high-cube warehouses – those with at least 200,000 gross square feet of floor area and a ceiling height of 24 feet or more – and urban infill in repurposed or rehabilitated industrial facilities.

Related to the trend of e-commerce and urban infill is the advancement of supply chain operations and design. Emerging trends in this area include warehouse automation, the use of big data and analytics for siting freight facilities (i.e., selecting an ideal location for meeting demand while meeting other objectives such as minimizing costs), and the Internet of Things.

The nature of truck fleets is gradually shifting as new vehicle technologies emerge; while much of the attention on connected and autonomous vehicle technology has focused on passenger cars, an increasing number of trucks are utilizing these technologies, encompassing sensors, communications, and/or processing software technologies for both steering and braking assistance. Freight vehicle electrification is another emerging trend that can reduce business costs and the overall environmental impact of the transportation sector. As a result, there will likely be forthcoming demand for electric grid expansion and high-capacity electric vehicle charging locations.

Finally, there are multiple ITS technologies that may be applied to freight mobility. These include smart roadside and virtual weigh-in-motion (WIM) applications that allow for wireless roadside inspections, automated electronic clearance at roadside check facilities, and automated commercial vehicle safety inspections at roadside check locations. Examples of ITS technologies that are particularly relevant to the CID include:

- ▶ **Dynamic Route Guidance** - advanced route planning and guidance that is responsive to current conditions. It includes technologies that incorporate real-time traffic and roadway conditions, allowing drivers to make re-routing decisions to a more optimal route.
- ▶ **Freight Signal Priority** - vehicle-to-infrastructure technologies that allow freight vehicle on-board equipment to communicate with traffic signal control equipment for the extension of green phases or other actions to enhance freight mobility and overall transportation safety.
- ▶ **Commercial Vehicle Parking** - information to motor carriers both pre-trip and en route. Parking availability information is collected from truck parking areas and is supplied to fleet managers,

mobile devices used by commercial vehicle operators, dynamic message signs on the roadway, or directly to in-vehicle systems.

- ▶ **Smart Work Zones** - controls traffic in areas of the roadway where maintenance, construction, and utility work activities are underway. Information on work zone speeds and delays are provided to the motorists prior to entering the work zones.

1.2.4 Traffic Study

The Traffic Study highlights the existing and future conditions of the vehicular traffic in the study area. Traffic volume data was collected in the form of both average daily traffic (ADT) volumes and turning movement counts (TMCs) at several locations on SR 70/Fulton Industrial Boulevard from SR 8/US 78/US 278/Donald L. Hollowell Parkway to SR 154/SR 166/Campbellton Road. The project team collected TMCs at 12 intersections along the corridor and 48-hour pneumatic tube counts at three other locations. Additionally, data from five GDOT count stations and other recent projects and studies were used to supplement the data to encompass the entire corridor. Overall, data was collected for 28 intersections and eight other locations on the SR 70/Fulton Industrial Boulevard corridor. TMCs included vehicle classification data, separating vehicles into the classes of cars, buses, single unit trucks, and heavy trucks. The existing traffic data were subsequently used to forecast traffic volumes for the future year of 2031, based on a projected growth rate of 1.5¹ percent per year.

Key findings from the Traffic Study include:

- ▶ SR 70/Fulton Industrial Boulevard currently operates at an acceptable Level of Service (LOS) on all segments between intersections. LOS is a measurement used to describe operating conditions on a roadway facility using factors such as speed, travel time, delay, maneuverability, and safety, ranging from LOS A (free-flow conditions) to LOS F (high levels of congestion), as shown in **Figure 1-8**. Generally, LOS D or better is considered acceptable by GDOT. All of these segments currently operate at LOS C or higher except for the southbound segment from SR 8/US 78/US 278/Donald L. Hollowell Parkway to I-20, which has the highest truck percentage along the corridor and operates at LOS D. The future year traffic analysis shows this acceptable LOS throughout the corridor would remain the case over the next ten years. Therefore, the Traffic Study concludes that widening SR 70/Fulton Industrial Boulevard would not be necessary by the year 2031, and if any congestion issue were to arise along the corridor, it would likely be due to issues at intersections, which could be more affordably and directly addressed by intersection upgrades and signal timing adjustments.

¹ E-commerce might push traffic growth higher in especially affected locations, such as near the UPS SMART hub

Figure 1-8. Level of Service Definitions

Level of Service A/B		Free flow traffic, no delays
Level of Service C/D		Some congestion, minimal delays
Level of Service E/F		Near or at capacity, delays

Source: *Quality/Level of Service Handbook*, Florida Department of Transportation (2013)

- ▶ Four unsignalized intersections on the SR 70/Fulton Industrial Boulevard corridor currently have a failing level of service in both the AM and PM peak hours:
 - at Villanova Drive/Westpark Place
 - at Tradewater Parkway/Riverside Drive
 - at Westgate Parkway north and south.

All of these intersections present an LOS F in both the AM and PM peak hours, except for the Westgate Parkway south intersection in the AM peak, which operates at LOS E. These poor LOS values are likely due to a lack of adequate gaps in vehicle traffic on SR 70/Fulton Industrial Boulevard and high side-street volumes, specifically a high percentage of trucks turning onto SR 70/Fulton Industrial Boulevard from these side-streets. As a result, the Traffic Study recommends installing traffic signals at these intersections to improve both LOS and safety for vehicles turning onto SR 70/Fulton Industrial Boulevard. For Westgate Parkway, the Traffic Study comments that a traffic signal at both intersections may not be necessary since the road is a loop, so installing a signal at one intersection will likely entice vehicles to use the signalized intersection.

- ▶ The signalized intersection of SR 70/Fulton Industrial Boulevard and Patton Drive shows current congestion during the AM peak hour, operating at LOS E. Congestion at this intersection is present on SR 70/Fulton Industrial Boulevard, where both northbound and southbound traffic have long thru queues and high delays for left-turning vehicles, and on Patton Drive, where eastbound traffic experiences similar queuing and delays. This congestion is augmented in the 2031 traffic forecast, where the intersection has an LOS F for the AM peak hour. The Traffic Study recommends geometric improvements that include constructing a second left-turn lane on SR 70/Fulton Industrial Boulevard northbound and adding a lane on the Patton Drive eastbound approach to improve operations at this intersection to LOS D in 2031.

- ▶ The signalized intersection of SR 70/Fulton Industrial Boulevard and SR 139/Martin Luther King Jr. Drive has an LOS D for current operations in both the AM and PM peak hour; however, delays of over 60 seconds were observed for certain turning movements, such as the SR 139/Martin Luther King Jr. Drive eastbound right-turning movement. Additionally, in the 2031 traffic forecast, the PM peak hour LOS worsened from LOS D to LOS F. The Traffic Study found that this intersection could be improved to LOS D in 2031 by introducing a third southbound thru lane to SR 70/Fulton Industrial Boulevard.
- ▶ Although the intersection of SR 70/Fulton Industrial Boulevard and SR 154/SR 166/Campbellton Road will continue to perform at an acceptable LOS through 2031, it was observed that during the PM peak hour the westbound through movement on SR 154/SR 166/Campbellton Road operates at an LOS D with 95th percentile queue of 490 feet. This queue may cause difficulty for vehicles exiting the newly built BP gas station on the southeast corner of the intersection and attempting to turn left on SR 154/SR 166/Campbellton Road. If this becomes an issue for drivers, the Traffic Study recommends that the gas station driveway be converted to right-in/right-out only.
- ▶ The other intersections along the corridor operate at an acceptable LOS in both current and future conditions, with the exception of the intersection with the I-20 eastbound ramps, which have a predicted 2031 LOS E in the AM peak. Volumes at this intersection may also be altered as part of the I-285/I-20 West Interchange project.

1.2.5 Report Organization

The remainder of this report is organized as follows:

- ▶ **Section 2** discusses the process and data sources used to identify projects as well as the metrics and process used to prioritize the identified project list.
- ▶ **Section 3** reviews funding strategies and sources that may be relevant to the projects recommended in this plan. These include federal, state, and local funds. This section also highlights specific projects that are most competitive for grant funding.
- ▶ **Section 4** presents an overview of Freight Cluster Plan recommendations for the Fulton Industrial District and includes a short-term action plan and an unconstrained long-term vision project list.
- ▶ **Section 5** concludes this Recommendations Report and discusses next steps for project implementation

2 PROJECT IDENTIFICATION & PRIORITIZATION

2.1 Project Identification Overview

To establish the final list of recommendations for the Freight Cluster Plan presented in Section 4 of this document, the project team first developed a list of all potential projects for the area, known as the Universe of Projects. These projects were identified through multiple avenues, which are described in detail below.

2.1.1 Inventory and Assessment

The Inventory and Assessment document noted any shortcomings in the FID transportation system. As a result, the project team was able to determine areas for improvement and develop a number of projects to address these issues.

2.1.2 Traffic Study

The recommendations that emerged from the Traffic Study were included in the Universe of Projects. These recommended projects were developed in the Traffic Study to specifically address locations operating at LOS E or F or where future traffic issues may arise.

2.1.3 Previously Identified Projects

A number of improvements in the CID have been proposed previously by various organizations, in plans that range from corridor to statewide. Previously identified projects that had not been completed, were not already underway (i.e., in the planning, engineering, or construction phases), and were determined to be beneficial for the CID were included in the Universe of Projects.

2.1.4 Stakeholder Input

The project team also used input from stakeholders to develop the Universe of Projects. During the stakeholder interview process, as well as during the three SAC meetings, participants provided input regarding any issues in the district based on day-to-day experience, and the project team used this input to create projects that would solve these issues. Similar input was gathered during the CID's quarterly Board of Directors meetings.

Some key themes that were brought up during these meetings were:

- ▶ Observed increases in traffic congestion in the area
- ▶ Recent and anticipated increases in warehouse square footage in the area, leading to more truck traffic
- ▶ Interest in extending coverage of public transit for employees in the district
- ▶ Interest in providing more pedestrian facilities to increase safety

After developing the Universe of Projects, the projects were assessed as part of an evaluation process consisting of two phases: screening and prioritization.

2.2 Phase 1: Screening

The screening phase involved evaluating the list of projects based on their practicality; impractical projects were eliminated. A number of factors were considered during this step, including:

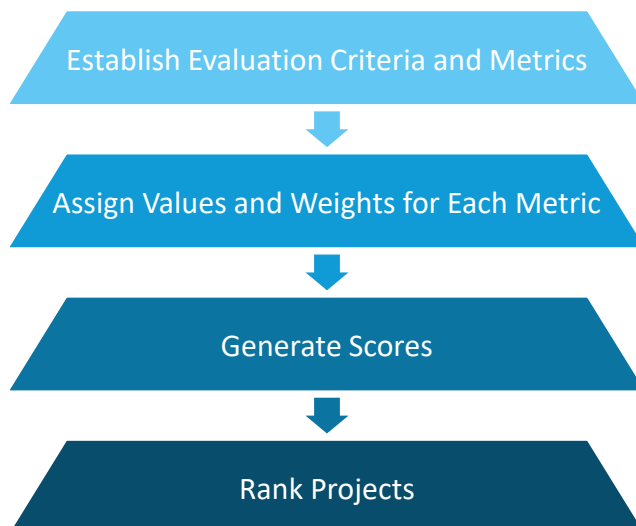
- ▶ Necessity – are the issues solved by this project critical to the function and prosperity of the district?
- ▶ Feasibility – are there components of the project such as cost, right-of-way availability, physical impediments (e.g. utilities, rivers, or railroads), or safety issues that make the project infeasible?
- ▶ Partner Support – will partner agencies such as the Metropolitan Atlanta Rapid Transit Authority (MARTA), GDOT, City of Atlanta, City of South Fulton, or Fulton County endorse the project?
- ▶ Stakeholder/Public Support - have the CID's stakeholders and members of the public expressed support or opposition to the project?

A total of 40 projects remained after the screening phase – the list of projects to be included as the final recommendations. The next step was to prioritize these projects in Phase 2 of the evaluation process.

2.3 Phase 2: Prioritization

The project team developed a robust method of evaluating the projects to determine how they should be prioritized. **Figure 2-1** shows the framework for the prioritization process.

Figure 2-1. Overview of the Prioritization Process



The project team took a location-based approach to project prioritization to help normalize the list of projects, which varied in terms of type and scale. Rather than using the metrics to directly evaluate each project, the district's roadway system was divided into sections and each section was evaluated. The team identified which sections were addressed by each project, and the sum of the scores of these segments determined the score for the project. Certain projects, such as policy-oriented projects, aren't associated with a specific physical location. These projects were scored solely on qualitative evaluation criteria, as described below.

2.3.1 Establishing Evaluation Criteria and Metrics

To help establish criteria and metrics for evaluating projects, the team identified eight project categories of importance to the district, and developed evaluation criteria and metrics within each project category. The project categories are:

- ▶ Access Management
- ▶ Access to Jobs
- ▶ Economic Development/Land Use

- ▶ Intersection Improvements
- ▶ Maintenance
- ▶ Safety
- ▶ Smart Corridor/ITS Technology
- ▶ Transit

The evaluation criteria were divided into quantitative and qualitative categories based on whether or not their metrics were directly measurable, as shown in [Table 2-1](#) and [Table 2-2](#). In addition to the eight project categories above, Public Input was included as a qualitative project category.

Table 2-1. Quantitative Evaluation Criteria and Metrics

Project Category	Criteria	Metric
Access to Jobs	Pedestrian infrastructure (w/in square mile of intersection; total jobs per segment region divided by area in square miles)	Sidewalks absent, >1,500 Jobs per mile
		Sidewalks absent, 500-1500 Jobs per mile
		Sidewalks absent, 0-500 Jobs per mile
		Sidewalks present
Access Management	Undesignated Truck Parking	Safety issues
		No safety issues
Intersection Improvements	2031 LOS	E, F AM and PM peak
		E, F only one peak
		D
		C+
Intersection Improvements	Curb Condition	Cracked curb/rutting
Maintenance	Pavement Condition (Segments Include Adjacent Side Streets)	Very Poor - Poor PSR rating
		Satisfactory - Fair PSR rating
		Good PSR rating
Safety	Vehicle Crashes	Fatal
		Injury
		No injury
Safety	Bike/Ped Crashes	Bicycle/pedestrian-involved crashes
Safety	Crash rates above statewide average	>100%
		51% - 100%
		< 51%
Smart Corridor/ITS Technology	Truck volumes (magnitude)	400+ INRIX Records per segment
		100-400 INRIX Records per segment
		< 100 INRIX Records per segment
Smart Corridor/ITS Technology	Vehicle excess hours of travel	8+ hours per segment
		2-8 hours per segment
		< 2 hours per segment
Smart Corridor/ITS Technology	Vehicle hours of unreliability per mile	20 + hours per segment
		5-20 hours per segment
		< 5 hours per segment
Transit	Bus stop infrastructure	No shelter, no lighting
		No shelter, lighting present
		Shelter present, no lighting
		Shelter and lighting present

Table 2-2. Qualitative Evaluation Criteria

Project Category	Criteria	Description
Public Input	SAC/Board Meeting mention	Stakeholder support
Public Input	Community Conflict (negative score)	Controversial project or location
Economic Development/ Land Use	Future Ready	Located at site of planned/in progress development or prepares for future operations
Economic Development/ Land Use	Gateway Visibility	Located at point of entry to District or enhances physical attractiveness
Economic Development/ Land Use	Economic Development Potential	Makes the District more appealing for future businesses to establish warehouses/offices here

2.3.2 Assigning Values and Weighing Metrics

After finalizing the list of criteria and their associated metrics, the project team determined a range of values to measure how each location scored under each metric. The point system assigned higher scores to recommendations deemed to be the highest priority; as such, the values for each metric ranged from the highest value, corresponding to the worst condition under each metric, to the lowest value (usually zero), corresponding to the best condition under each metric. Both quantitative and qualitative metrics had associated values. An example of values for two metrics are shown in [Table 2-3](#). A full scoring matrix is available in [Appendix C](#).

Table 2-3. Sample Point Values for Scoring Metrics

Project Category	Criteria	Metric	Point Values
Maintenance	Pavement Condition	Very Poor—Poor PSR Rating	4
		Satisfactory—Fair PSR Rating	2
		Good PSR Rating	0
Safety	Crash Rates Above Statewide Average	>100%	6
		51%—100%	4
		< 51%	2

During the third SAC meeting, attendees were asked to rank the project categories by level of priority. This input was then used to weigh each project category. [Table 2-4](#) shows the voting results from the third SAC meeting and how this was translated into category weights.

Table 2-4. Project Category Weight Assignments

Project Category	SAC Ranking	Score Weight (Out of 1)
Intersection Improvements	1 st	1
Safety	2 nd	0.90
Transit	3 rd	0.80
Access to Jobs	4 th	0.73
Access Management	5 th	0.68
Maintenance	6 th	0.56
Smart Corridor/ITS Technology	7 th	0.54
Economic Development/Land Use	8 th	0.50

2.3.3 Scoring and Ranking Projects

As mentioned above, each segment of the project area and intersection with SR 70/Fulton Industrial Boulevard was given a value for each of the 17 criteria. Project scores were determined by multiplying the criterion score by its associated weight, and then summing the resulting values for each project area segment addressed by the project in question. Subsequently, the projects were ranked based on their total score, with higher scores receiving a higher rank.

3 FUNDING STRATEGIES

3.1 Overview

Project funding is a prerequisite for implementation, and some funding sources are more relevant to certain project types, scopes, and scales than others. The project team considered a range of funding opportunities to develop an implementation strategy for the Freight Cluster Plan. While many recommendations may be funded by the CID in partnership with the City of Atlanta and/or the City of South Fulton, there are a wide range of federal and state grant and financing opportunities that can heavily supplement local contributions.

3.2 Potential Funding Sources

A variety of funding sources are potentially available to fund the Freight Cluster Plan project recommendations. These include federal, state, and local sources as well as CID revenues and public-private partnerships. When identifying funding sources for a particular project, the CID can seek opportunities to leverage multiple funding sources, including partnerships with public agencies such as MARTA, the State Road and Tollway Authority (SRTA), GDOT, and ARC, or private entities such as Georgia Power and Omnitrac.

Brief summaries of a range of potential funding sources are provided in this section. A matrix outlining potential applicable funding sources for each recommended project can be found in [Appendix A](#).

3.2.1 Federal Resources

A major funding source for freight related projects in the coming years will be the Bipartisan Infrastructure Law (BIL, also known as the Infrastructure Investment and Jobs Act). The BIL was passed in November 2021 and will provide funding to rebuild roads, bridges and railways, expand access to clean drinking water, ensure access to high-speed internet service, address climate change, and address environmental justice. Dedicated funding for state highway and transportation agencies would increase 21 percent through the Highway Trust Fund. The BIL reauthorizes many of the programs previously offered under the Fixing America's Surface Transportation (FAST) Act with expanded or realigned project priorities.² **Table 3-1** describes federal funding opportunities that the Boulevard CID could leverage when implementing plan recommendations; eligible project

type descriptions focus on new priorities under BIL funding where applicable.

It is important to note that many of these funding opportunities are administered by the ARC through the Transportation Improvement Program (TIP), which is the only way that the CID and local jurisdictions can apply for these funds. The TIP is a work plan with funding allocated to projects to be distributed over specific phases and fiscal years for project implementation. Eligible projects submitted by local governments must be included in the Regional Transportation Plan (RTP). Ideal projects are those that minimize environmental impacts, right-of-way, and other factors that lead to a longer federal review process. The ideal cost for projects funded through the TIP is between \$1 million and \$5 million.

² <https://www.whitehouse.gov/briefing-room/statements-releases/2021/11/06/fact-sheet-the-bipartisan-infrastructure-deal/>

Table 3-1. Federal Funding Sources

Program	Description	Eligible Project Types
BIL: National Highway Performance Program (NHPP) ³	The NHPP provides support for the condition and performance of the National Highway System (NHS), construction of new facilities, and progress towards performance targets established in States' asset management plans. The roadway segments in the FID that are part of the NHS are Donald L. Hollowell Parkway, Camp Creek Parkway, Campbellton Road, I-285, and I-20. The FHWA apportions funding to each state for distribution among programs. Each state's NHPP apportionment is specified by law. Funding comes primarily from the Highway Trust Fund, generated by federal motor fuel taxes.	<ul style="list-style-type: none"> ▶ Construction, reconstruction, resurfacing, restoration, rehabilitation, preservation, or operational improvement of segments of the NHS ▶ Measures that increase resiliency to the impacts of sea level rise, extreme weather, flooding, and other natural disasters* ▶ Projects that reduce the risk of failure of critical National Highway System infrastructure ▶ Bridge reconstruction, resurfacing, restoration, rehabilitation, or preservation on eligible structures on the NHS

³ https://www.fhwa.dot.gov/bipartisan-infrastructure-law/docs/bil_overview_20211122.pdf

Program	Description	Eligible Project Types
BIL: Surface Transportation Block Grant Program (STBG)	<p>The STBG has the most flexible eligibilities among Federal-aid highway programs, and funds can be used to preserve or improve roadway and nonmotorized transportation facilities. The STBG includes a funding set aside for transportation alternatives that has increased in value under the new BIL legislation.</p> <p>A subset of STBG funding is at ARC's discretion and is used to fund the Livable Center Initiative (LCI) program, Freight Cluster program, and Transportation Improvement Program projects.⁴</p>	<ul style="list-style-type: none"> ▶ Construction of highways, bridges, transit capital projects, and truck parking facilities ▶ Operational and safety improvements ▶ Bike/ped facilities, and recreational trails ▶ Surface transportation planning ▶ Electric vehicle charging infrastructure and vehicle-to-grid infrastructure* ▶ Installation and deployment of ITS technologies* ▶ Projects that facilitate intermodal connections between emerging technologies* ▶ Federal-aid highway condition and performance preservation or improvement ▶ Bridge projects on any public road ▶ On- and off-road pedestrian and bicycle facilities ▶ Infrastructure projects that improve non-driver connections to public transportation
BIL: Highway Safety Improvement Program (HSIP)	<p>The HSIP is comprised of three parts:</p> <ul style="list-style-type: none"> ▶ The Strategic Highway Safety Plan (SHSP) is a state-coordinated plan that provides a framework for reducing serious injury and fatalities on public roads. ▶ The State HSIP provides a framework for identifying and reviewing traffic safety issues to identify improvement measures. ▶ The Railway-Highway Crossing Program (RHCP) provides funds to improve safety features at public at-grade railway-highway crossings. 	<ul style="list-style-type: none"> ▶ Non-motorized transportation improvements including: leading pedestrian intervals, traffic calming and vehicle speed reduction features and designs, installations or upgrades of traffic control devices for pedestrians and bicyclists, and roadway separations between vehicles and pedestrians/bicyclists* ▶ Educational and enforcement activities* ▶ Infrastructure safety-related activities

⁴ <https://atlantaregional.org/transportation-mobility/transportation-planning/transportation-improvement-program/>

Program	Description	Eligible Project Types
BIL: Congestion Mitigation and Air Quality Improvement Program (CMAQ)	<p>CMAQ funds are available for projects that help meet the requirements of the Clean Air Act in nonattainment areas (those that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter), and maintenance areas (former nonattainment areas that are now in compliance).</p> <p>The ARC administers CMAQ funds for projects within the Atlanta region, including within the FID.</p>	<ul style="list-style-type: none"> ▶ New eligibility for shared micromobility, including bike and scooter share* ▶ Purchase of medium- or heavy-duty zero emission vehicles and charging equipment* ▶ Transportation project or program likely to reduce air pollution or contribute to ambient air quality standards
BIL: Active Transportation Infrastructure Investment Program	The Active Infrastructure Investment Program is a competitive grant for active transportation investments that provide an active transportation network or spine.	<ul style="list-style-type: none"> ▶ Projects that provide an active transportation network or spine*
BIL: Strengthening Mobility and Revolutionizing Transportation (SMART) Grant Program	The SMART Grant Program provides funding for demonstration projects focused on connected infrastructure and community technologies to improve transportation efficiency and safety.	<ul style="list-style-type: none"> ▶ Projects that demonstrate coordinated automation, connected vehicles, sensor-based infrastructure, systems integration, or smart traffic signal technologies among other infrastructure technology concepts*
BIL: National Highway Freight Program (NHFP)	Improve the efficient movement of freight on the National Highway Freight Network (NHFN). See section below for information about Critical Urban Freight Corridors.	<ul style="list-style-type: none"> ▶ Investing in infrastructure and operational improvements that strengthen economic competitiveness, reduce congestion, reduce the cost of freight transportation, improve reliability, and increase productivity ▶ Improving the safety, security, efficiency, and resiliency of freight transportation in rural and urban areas ▶ Improving the state of good repair of the NHFN ▶ Using innovation and advanced technology to improve NHFN safety, efficiency, and reliability ▶ Improving the efficiency and productivity of the NHFN

Program	Description	Eligible Project Types
Rebuilding American Infrastructure with Sustainability and Equity (RAISE) ⁵	RAISE is a competitive grant program through the USDOT that funds projects that seek to build and repair portions of national freight and passenger transportation networks. State and local entities can apply for funding for multi-modal, multi-jurisdictional projects. RAISE grants can directly provide capital funding to any public entity, making this funding stream more flexible than other federal programs that can only allocate funding to specific groups of applicants.	<ul style="list-style-type: none"> ▶ Road, rail, transit, and port projects on national freight and passenger transportation networks ▶ Projects that create jobs, improve safety, apply transformative technology, and address climate change and advance racial equity
Infrastructure for Rebuilding America (INFRA) ⁶	INFRA is a competitive grant program through the USDOT that seeks to rebuild the nation's infrastructure while creating jobs. Priority projects include highway and rail projects of regional and national economic significance.	<ul style="list-style-type: none"> ▶ Highway and rail projects of regional and national economic significance ▶ Projects that improve local economies and create jobs ▶ Projects that utilize innovative technology
Accelerated Innovation Deployment Demonstration (AID) ⁷	AID funds projects that demonstrate proven innovations in delivering road and bridge projects more cost-effectively.	<ul style="list-style-type: none"> ▶ Road, bridge, and highway construction and repair projects

* New eligibilities and/or areas of emphasis under the BIL

⁵ <https://www.transportation.gov/RAISEgrants/about>

⁶ <https://www.transportation.gov/buildamerica/financing/infra-grants/infrastructure-rebuilding-america>

⁷ <https://www.fhwa.dot.gov/innovation/grants/>

Critical Urban Freight Corridors

During the upcoming update of the Statewide Freight and Logistics Plan, GDOT, in consultation with ARC, has the opportunity to designate a Critical Urban Freight Corridor (CUFC) network under the National Highway Freight Network (NFHN). CUFCs are important freight corridors that provide connectivity to the NFHN, which consists of the Primary Highway Freight System (PHFS) and intermodal connection facilities. It is recommended that the Boulevard CID coordinate with ARC and GDOT to have the FID's major freight corridors added to the CUFC network, as projects that improve the efficient movement of freight on a CUFC are eligible for NHFP and INFRA grant funds. [Table 3-2](#) and [Figure 3-1](#) show the corridors that are strong candidates for inclusion in the Atlanta region's CUFC network.

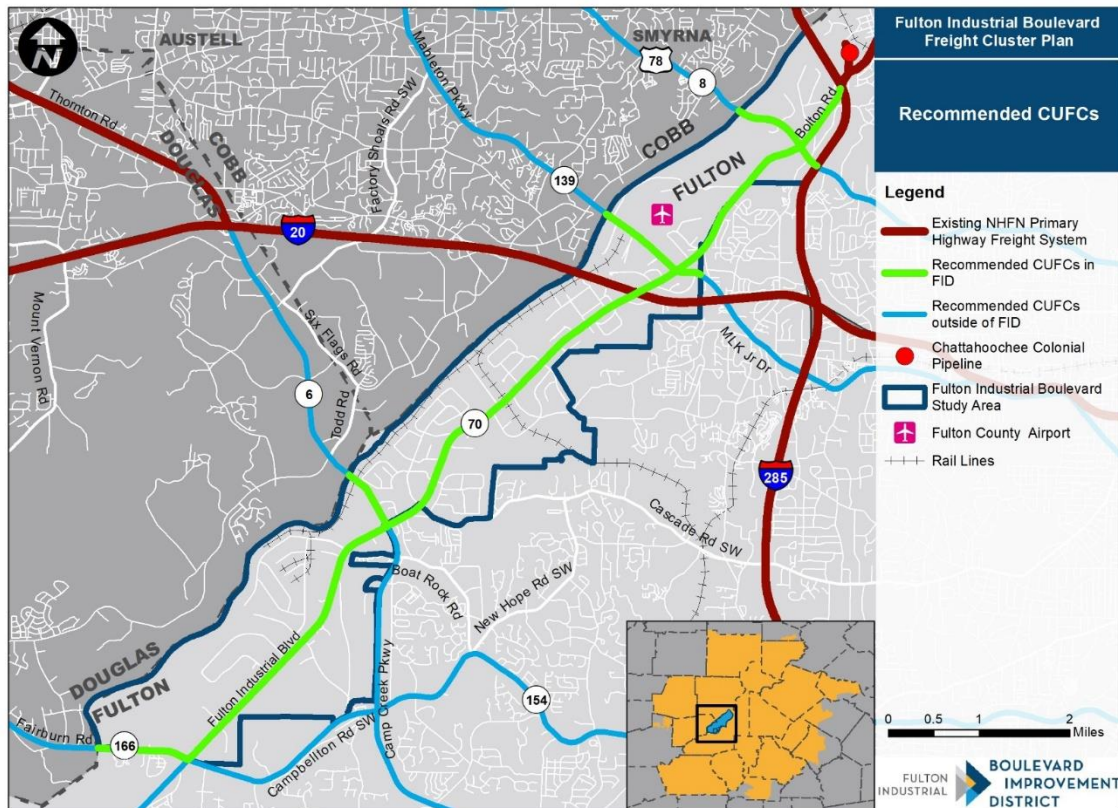
Table 3-2. Recommended Critical Urban Freight Corridors

Roadway	NFHN Connections	CUFC ID*
SR 70/Fulton Industrial Boulevard	I-20, I-285, Bolton Road, Chattahoochee Colonial Pipeline	J, K
SR 6/Camp Creek Parkway	I-20, I-285, I-85, Thornton Road, Hartsfield Jackson Atlanta International Airport, Norfolk Southern Whitaker Intermodal Facility	H, J, K
SR 154/SR 166/Campbellton Parkway	I-285, Norfolk Southern Industry Yard	H, J, K
SR 139/Martin Luther King Jr. Drive	I-20, I-285	I, J, K
SR 8/US 78/US 278/Donald L. Hollowell Parkway	I-285	I, J, K

Source: FHWA and Consultant Analysis

**Note: CUFC ID: H = Connects an intermodal facility to the PHFS, the Interstate System, or an intermodal freight facility; I = Located within a corridor of a route on the PHFS and provides an alternative highway option important to goods movement; J = Serves a major freight generator, logistic center, or manufacturing and warehouse industrial land; K = Corridor that is important to the movement of freight within the region, as determined by the MPO or the State.*

Figure 3-1. Recommended Critical Urban Freight Corridors



3.2.2 State Resources

State funding is primarily available through GDOT and SRTA. **Table 3-3** describes state funding opportunities that the Boulevard CID could leverage when implementing plan recommendations.

Table 3-3. State Funding Sources

Program	Description	Eligible Project Types
GDOT: Local Maintenance and Improvement Grant (LMIG) ⁸	LMIG funds local road maintenance and improvement activities. Funding distribution is determined by the ratio of total local centerline road mileage and population to the statewide centerline road mileage and population. 2022 LMIG Formula amounts for City of Atlanta and City of South Fulton are \$4,477,269.76 and \$1,163,120.52 respectively. Both City of Atlanta and City of South Fulton have a required 30 percent match.	<ul style="list-style-type: none"> ▶ Intersection improvements ▶ Turn lanes ▶ Signal installation or improvement ▶ Sidewalk within right of way of a public roadway or street ▶ Utility and/or drainage infrastructure replacement ▶ Bridge repair or replacement ▶ Patching, leveling, resurfacing, grading, drainage, and paving roadways
GDOT: Quick Response ⁹	The Quick Response Project Program funds operational projects that can be implemented in a short period of time – typically three to four months – and for under \$200,000.	<ul style="list-style-type: none"> ▶ Intersection improvements ▶ Turn lane additions and extension ▶ Restriping
GDOT: Operational Improvements Lump Sum ¹⁰	GDOT allocates a portion of state funding for projects that do not substantially increase roadway capacity. Funds are available for construction, preliminary engineering, and rights-of-way. No local match is required.	<ul style="list-style-type: none"> ▶ Intersection improvements ▶ Turning lanes ▶ Ramp exit and interchange improvements

⁸ <http://www.dot.ga.gov/PS/Local/LMIG>

⁹ <http://www.dot.ga.gov/BuildSmart/Projects/Pages/QuickResponse.aspx>

¹⁰ <https://www.flipsnack.com/gadot/draft-stip-fy-21-24/full-view.html>

Program	Description	Eligible Project Types
GDOT: Signal Upgrades Lump Sum ¹⁰	GDOT allocates a portion of state funding for projects that do not substantially increase roadway capacity. Funds are available for construction, preliminary engineering, and rights-of-way. No local match is required.	<ul style="list-style-type: none"> ▶ Signal designs, specifications, upgrades, operations, maintenance, and signal asset replacements
GDOT: Safety Improvements Lump Sum ¹⁰	GDOT allocates a portion of state funding for projects that do not substantially increase roadway capacity. Funds are available for construction, preliminary engineering, and rights-of-way. No local match is required.	<ul style="list-style-type: none"> ▶ Intersection improvements ▶ Pavement markings ▶ Signals ▶ Signing and turning lanes
GDOT Freight Operational Lump Sum Funding Program ¹¹	GDOT allocates a portion of state funding for projects that do not substantially increase roadway capacity. Funds are available for construction, preliminary engineering, and rights-of-way. No local match is required.	<ul style="list-style-type: none"> ▶ Truck parking: increased truck parking supply at existing public facilities; truck parking availability system deployment ▶ Investments to mitigate operational issues related to geometry ▶ Improvement of truck movement for Georgia's logistics-enabled industries (e.g. manufacturing, distribution, etc.) ▶ Roadway realignments and truck-capable roundabouts ▶ Passing lanes, truck climbing or deceleration lanes, and turn lanes
SRTA: Georgia Transportation Infrastructure Bank (GTIB) ¹²	The GTIB is a grant and low-interest loan program focusing on projects that enhance mobility and increase economic development for local communities. The maximum grant request amount is \$2 million.	<ul style="list-style-type: none"> ▶ Transportation projects with economic development benefits and eligibility for state motor-fuel funds

¹¹ http://www.dot.ga.gov/AboutGeorgia/Board/Board%20Meeting%20Documents/July2021_CommitteeMeetings.pdf

¹² <https://www.srta.ga.gov/gtib/>

3.2.3 Local Resources

Funding sources allocated at the local level are primarily available through the ARC and typically come from federal sources, such as the BIL (discussed in [Section 3.2.1](#)). Funds are also available through Fulton County's Transportation Special Purpose Local Option Sales

Tax (TSPLOST). [Table 3-4](#) describes funding opportunities that the Boulevard CID can seek through local agencies when implementing plan recommendations.

Table 3-4. Local Funding Sources

Program	Description	Eligible Project Types
Fulton County: TSPLOST ¹³	The TSPLOST is a .75 cent tax first approved by voters in 2016 and renewed during the 2021 election. Voters were given a specific list of projects for which funding would be used.	<ul style="list-style-type: none"> ▶ TSPLOST funding can be used for pedestrian, bike, streetscape, and landscape projects within the FID ▶ The TSPLOST project list includes a generic category for intersection improvements. The FID can likely access some of these funds <p>Additional project categories are eligible for TSPLOST funding but are not currently listed within the FID on the 2022 project list:</p> <ul style="list-style-type: none"> ▶ Congestion relief and roadway projects ▶ Bridges ▶ Maintenance and safety improvements ▶ Quick Response projects

In addition to access to federal funds, the ARC provides a Community Development Assistance Program (CDAP). CDAP is staff assistance from ARC's Community Development group and may be particularly helpful to the CID when pursuing workforce development programs.

¹³ <https://www.fultoncountyga.gov/inside-fulton-county/fulton-county-initiatives/tsplost>

3.2.4 Public-Private Partnerships

Public Private Partnerships (P3s) are collaborative agreements between government agencies and private-sector entities that can be used to finance, operate, and maintain projects. Usually long-term contracts, the private funding element of P3s enable faster implementation and shared risk between partners. A typical P3 involves revenue streams (for example, from tolling or tax increment financing) accruing to a private partner, who in turn undertakes facility development that yields public benefits. Private financiers tend to require large scale initiatives in order to offset the risk of a project not moving forward.

3.3 Revenue Forecasting

The Boulevard CID anticipates that it will generate revenue sufficient to provide a local match for one large-scale project every two years with available funding for additional smaller projects. Projected revenues are approximately \$500,000 every two years. Note that revenue forecasts are based on trends and may vary based on assessed property values. Project budgets for 2022 and 2023 are higher because of committed funds for project matches, approved by the CID board in December 2021. Based on this, conservative revenue estimates are applied to the remainder of the timeframe to establish a probable budget forecast (see [Table 3-5](#)).

Table 3-5. CID Project Budget Forecast Example

Year	Project Budget
2022	\$890,000*
2023	\$450,000*
2024	\$500,000
2025	\$0
2026	\$600,000
1-5 Year Budget	\$2,440,000
2027	\$0
2028	\$750,000
2029	\$500,000
2030	\$0
2031	\$900,000
6-10 Year Budget	\$2,150,000
Cumulative 10-Year Budget	\$4,590,000

**2022 and 2023 project budgets have already been committed as local matches for a TIP application and LMIG funding, respectively. See project descriptions in Section 3.4 for further detail.*

3.4 Competitive Projects for Grant or Formula Funding

The following projects are suited for funding via competitive grants from federal and/or state sources or for funding via formula funds. The project team anticipates that the CID and the local jurisdiction will provide a 20 percent local match to accompany most funding applications, although some programs will require a larger or smaller financial commitment. While all of the competitive projects described in this section are priority projects and appear in the financially feasible Short-Term Action Plan in [Section 4](#) of this report, the projects do not necessarily reflect the highest ranked projects. Some top priority projects are smaller initiatives or would be better implemented at the local level without the complications associated with grant applications and administration, or requirements that arise from federal or state formula programs.

3.4.1 Potentially Competitive Projects

Project Name (ID): Intersection Improvements at Fulton Industrial Boulevard and Donald L. Hollowell Parkway (FIB-1)

**Note: An application for this project was submitted as part of ARC's 2021 TIP solicitation. The CID has committed \$890,000 as a local match. A second application for the streetscaping and bridge railing over I-285 was submitted as part of SRTA's GTIB call for projects. The CID has committed \$450,000 as a local match. If this project does not receive funding through TIP, the Boulevard CID could apply through other federal funding streams or to GDOT directly. Traffic growth in the area, especially from the new UPS SMART Hub, should be taken into consideration if a new application is required.*

Project Purpose: The goals of this project are to improve safety along the corridor, increase walkability, improve the transit environment, and increase operational performance at the intersection. The project will also create a visual gateway so visitors entering from I-285, SR 8/US 78/US 278/Donald L. Hollowell Parkway, or Bolton Road know they've entered the Fulton Industrial District, setting it apart from surrounding areas and giving it a favorable image.

Project Description: The project consists of an extension of the existing streetscape along Fulton Industrial Boulevard and improved sidewalks and pedestrian access, pedestrian lighting, trees, and a landscaped median. Additionally, the project will include operational and safety improvements at the intersection of SR 8/US 78/US 278/Donald L. Hollowell Parkway and SR 70/Fulton Industrial Boulevard, through the addition of a dual left-turn lane from SR 70/Fulton Industrial Boulevard northbound to SR 8/US 78/US 278/Donald L. Hollowell Parkway westbound and the addition of a dual left-turn lane from SR 8/US 78/US 278/Donald L. Hollowell Parkway westbound to SR 70/Fulton Industrial Boulevard southbound.

Cost Estimate:

- ▶ Approximately \$4,450,000
- ▶ The cost estimate was developed using the ARC Cost Estimation tool, engineering judgment, and input from roadway engineers and planners. It reflects the major project components such as crosswalks, gateway signs, art, and landscaping.

- ▶ Includes typical phases/components such as PE, ROW, UTL, engineering inspection, CST and contingency.

Project Competitiveness:

Through partnership with a local jurisdiction, this project is competitive for federal funding through ARC's Transportation Improvement Program (TIP) because it addresses safety measures that reduce roadway risks for all users on a regionally significant corridor. Implementation of dual left turn lanes will improve intersection operations and reduce conflicts between freight and passenger vehicles. In addition, new sidewalks and crosswalks will improve the built environment for pedestrians.

Potential Challenges: This project is dependent on competitive TIP funding. If TIP funding is not awarded during this application cycle, the CID will either have to wait to submit a new application during the next round (likely in two years) or will have to pursue other funding sources.

Concept Level Drawing

Figure 3-2 shows a conceptual rendering of what streetscape improvements would look like at the intersection of SR 70/Fulton Industrial Boulevard and SR 8/US 78/US278/ Donald L. Hollowell Parkway.

Figure 3-2. Proposed Streetscape Improvements at Fulton Industrial Boulevard and Donald L. Hollowell Parkway



Project Name (ID): Intersection and operational improvements at Fulton Industrial Boulevard and Westgate Parkway (North and South) (FIB-2)

Project Purpose: This project aims to make safety and operational improvements for vehicles turning left onto SR 70/Fulton Industrial Boulevard from Westgate Parkway, especially trucks. Currently, these vehicles are experiencing high delays and failing LOS scores in both the AM and PM peak hours.

Project Description: Signal installation with crosswalks at the southern intersection and the conversion of the northern intersection into a Reduced Conflict U-Turn (RCUT) intersection. Also, increase the turning radii at the west corner of the northern intersection and the north corner of the southern intersection.

Probable Cost Estimate:

- ▶ Approximately \$933,000
- ▶ The cost estimate was developed using the ARC Cost Estimation tool, engineering judgment, and input from roadway engineers and planners. It reflects the major project components such as sidewalks and context sensitive pedestrian crossings.
- ▶ Includes typical phases/components such as PE, ROW, UTL, engineering inspection, CST and contingency.

Project Competitiveness:

This project will be competitive for state funding sources, such as GDOT's Operational Improvement Lump Sum Program. The District's key role in both local and regional freight operations make it competitive for these funds; this project improves operational performance on SR 70/Fulton Industrial Boulevard, the main thoroughfare in a key freight district, by discouraging trucks from making a left turn at the northern intersection and subsequently improving traffic flow for vehicles on the corridor.

This project will be competitive for several federal formula funding sources under the umbrella of the federal BIL. The purpose of the BIL's National Highway Performance Program (NHPP) is to provide support for the condition and performance of the National Highway system. The project is also competitive under the federal INFRA grant program due to the economic significance of the freight cluster and this project's benefits to traffic flows, truck throughputs, and efficiency of goods movement.

Potential Challenges:

- ▶ Employees of some businesses located along Westgate Parkway may be opposed to the RCUT at the northern intersection, as their trucks would no longer be able to turn north on SR 70/Fulton Industrial Boulevard at the intersection. It will be important to engage with these stakeholders before and during this project, which will provide an opportunity to explain the benefits of the project. The tradeoff of increased safety and ease for left-turning vehicles in exchange for an extra couple of minutes to loop around Westgate Parkway should justify the project for these employees. The alternative solution to an RCUT is a signal at the northern Westgate Parkway intersection. This solution is undesirable because of its close proximity to the proposed signal at the southern Westgate Parkway intersection; when signals are too close to one another, they risk interrupting traffic flow and could potentially interfere with operations on Fulton Industrial Boulevard.

Other Information to Support Project:

- ▶ The West Fulton Commerce Park project proposes a new access point on SR 70/Fulton Industrial Boulevard across from the southern Westgate Parkway outlet. The increased traffic, especially truck traffic, that would result from this new access point, along with competing left-turn movements from vehicles coming from Westgate Parkway and the West Fulton Commerce Park, is another reason to introduce a traffic signal to the intersection.
- ▶ A traffic engineering study was conducted in May 2020 to identify if a traffic signal was needed at either intersection. The study concluded that if the northern intersection were to be converted to an RCUT, the southern intersection would meet three warrants for the installation of a traffic signal. The study also indicated that through preliminary conversations GDOT agreed with the placement of the traffic signal and RCUT.

Concept Level Drawing

Figure 3-3 shows the proposed RCUT at the northern Westgate Parkway intersection and the proposed traffic signal at the southern intersection, including the proposed access point as part of the West Fulton Commerce Park development.

Figure 3-3. Proposed RCUT and Signal at Westgate Parkway North and South



Project Name (ID): Intersection Improvements along Fulton Industrial Boulevard (Multiple Projects)

Project Purpose: These projects will improve operations for freight vehicles, passenger cars, and pedestrians at various intersections along SR 70/Fulton Industrial Boulevard. As a package, this combination of intersection improvements scored highest in the project prioritization process, intersection projects ranked as the most important issue among stakeholders, and these particular locations had highest demonstrated need during the traffic study and field observations.

Project Description: Intersection operational improvements along the corridor reflect a comprehensive approach to improving freight movement throughout the district. These projects will be impactful individually, and as a group they will improve truck turning movements and overall operations throughout the District. Each project and its associated cost is described below.

The traffic study identified several intersections with SR 70/Fulton Industrial Boulevard that need operational improvements in order to avoid operating at a failing LOS by 2031. These are:

- ▶ FIB-4: At Tradewater Parkway/Riverside Drive: Install a traffic signal with crosswalks at the intersection, add a left turn lane on the westbound approach, restripe eastbound approach to thru/left and right turn only, extend northbound right turn lane to 175 ft with 100 ft taper, extend southbound left turn lane to 235 ft with 100 ft taper, and increase turning radius at south corner of intersection (\$1,391,000).
- ▶ FIB-5: At Westpark Place/Villanova Drive: Conduct a signal warrant analysis at the intersection (\$25,000).
- ▶ FIB-6: At Patton Drive: Add a second left turn lane on SR 70/Fulton Industrial Boulevard in the northbound direction; widen the eastbound approach of Patton Drive to two lanes (a thru/left and a right turn lane); add a receiving lane on Patton Drive for the new left turn lane on SR 70/Fulton Industrial Boulevard; improve turning radii at the north corner by creating a consistent curve (\$1,387,000).
- ▶ FIB-7: At SR 139/Martin Luther King Jr. Drive: Add a thru lane on the SR 70/Fulton Industrial Boulevard southbound approach (\$1,555,000).

In addition, the CID's 2013 master plan included other intersection improvement recommendations, one of which remains relevant based on existing traffic conditions and observed field conditions. This intersection is:

- ▶ FIB-8: SR 70/Fulton Industrial Boulevard at Wendell Drive: Increase the turning radius on north corner of the intersection; push back stop bar on Wendell Drive southbound; install pedestrian crosswalks and signals across SR 70/Fulton Industrial Boulevard (\$521,000).

During a comprehensive field analysis of existing intersection conditions, the project team identified several instances of rutting and/or cracked curbs that indicate insufficient turning radii for trucks. The locations identified for turning radii increases are on SR 70/Fulton Industrial Boulevard at:

- ▶ FIB-9: The north corner of Wharton Drive/Mendel Drive intersection (\$450,000).
- ▶ FIB-10: The north corner of Phillip Lee Drive intersection (\$450,000).
- ▶ FIB-11: All corners of Eagle Vista Drive/Kendall Park Drive intersection (\$1,350,000).

- ▶ FIB-12: The north corner of James Aldredge Boulevard intersection (\$450,000).
- ▶ FIB-13: All corners of Bucknell Drive intersection (\$1,350,000).
- ▶ FIB-14: The north corner of Marvin Miller Drive intersection (\$450,000).

Depending on available funding, intersection projects can be grouped together for simultaneous implementation. Intersection improvement projects are listed in the Short-Term Action Plan in order of priority, with FIB-3 being the highest priority intersection on the list. Examples of scenarios for combining the projects into groups for two funding sources are shown below. However, the grouping of these elements and the number of phases is ultimately up to the Boulevard CID to decide, depending on available funding sources, funding and implementation timeframe, and partnerships.

Scenario 1: Funding through GDOT's Freight Operational Lump Sum Program			Scenario 2: Funding through ARC's TIP		
Phase	Elements	Cost	Phase	Elements	Cost
A	FIB-4	\$1,391,000	A	FIB-4, FIB-5, FIB-6, FIB-7, FIB-9	\$4,808,000
B	FIB-5	\$25,000	B	FIB-8, FIB-10, FIB-11, FIB-12, FIB-13, FIB-14	\$4,571,000
C	FIB-6	\$1,387,000			
D	FIB-7	\$1,555,000			
E	FIB-8, FIB-9, FIB-10	\$1,421,000			
F	FIB-11, FIB-12	\$1,800,000			
G	FIB-13, FIB-14	\$1,800,000			

Cost Estimate

- ▶ Total: Approximately \$9,379,000
- ▶ Projects can be combined into multiple phases depending on the desired funding source. Individual project element costs are listed above.
- ▶ The cost estimates were developed using the ARC Cost Estimation tool, engineering judgment, and input from roadway engineers and planners. It reflects the major project components such as traffic signal infrastructure, turning lane construction, and pedestrian infrastructure.
- ▶ Includes typical phases/components such as preliminary engineering (PE), right-of-way (ROW), utilities (UTL), engineering inspection, construction (CST) and contingency.

Project Competitiveness:

These projects will be competitive for state funding sources, such as GDOT's Freight Operational Lump Sum Program. The District's key role in both local and regional freight operations make it competitive for these funds; this project improves operational performance on SR 70/Fulton Industrial Boulevard, the main thoroughfare in a key freight district, by improving intersections to better suit trucks' needs.

These projects will also be competitive for several federal funding sources under the umbrella of the federal BIL. The purpose of the BIL's National Highway Performance Program (NHPP) is to provide support for the

condition and performance of the National Highway System; this project improves operational performance on the SR 70/Fulton Industrial Boulevard, the main thoroughfare in a key freight district, by improving intersections to better suit trucks' needs. The project is also competitive under the federal INFRA grant program due to the economic significance of the freight cluster and this project's benefits to traffic flows, truck throughputs, and efficiency of goods movement. Both NHPP and INFRA applications would require support from GDOT. The Surface Transportation Block Grant (STBG) also falls within the federal BIL; however, this is under the ARC's purview and therefore would require a TIP application for access to funding.

Potential Challenges:

- ▶ A number of these improvements require right-of-way acquisition, which is common for roadway projects. Ease and cost of right-of-way acquisition can vary depending on the property owner and amount of land required.
- ▶ Utility relocation is another component that can vary in cost and level of difficulty, depending on the organizations involved.
- ▶ The project at the SR 139/Martin Luther King Jr. Drive intersection will likely need to be programmed through ARC, as it adds capacity to SR 70/Fulton Industrial Boulevard.
- ▶ There is limited space for the turning radius improvement at Wharton Drive/Mendel Drive.

Other Information to Support Project:

- ▶ The West Fulton Commerce Park (formerly known as the Woodbury E-Commerce Park and Distribution Center) is under construction and is classified by ARC as a Development of Regional Impact (DRI #2654). The project is planned as a mixed-use development, including office space, retail, industrial warehousing, townhouses, a shopping center, a grocery store, and other amenities on 56 acres. The project is expected to generate over 24,000 net trips and is planned to have three new access points on SR 70/Fulton Industrial Boulevard (one of which has been constructed) and four new access points on Riverside Drive. This expected increase in traffic volumes in the area supports the signal installation at SR 70/Fulton Industrial Boulevard and Tradewater Parkway/Riverside Drive.
- ▶ A Traffic Signal Warrant Analysis was completed in January 2019 for the intersection of SR 70/Fulton Industrial Boulevard and Tradewater Parkway/Riverside Drive in anticipation of a proposed development directly south of the intersection. The analysis concludes that three signal warrants would be met if the proposed development were to be built, which supports the signal installation at the intersection.

Concept Level Drawing

Figure 3-4 shows the locations of the proposed intersection improvements. **Figure 3-5** through **Figure 3-8** show the proposed changes at the Tradewater Parkway/Riverside Drive, Patton Drive, SR 139/Martin Luther King Jr. Drive, and Wendell Drive intersections, in order.

Figure 3-4. Location Map of Proposed Intersection Improvements along Fulton Industrial Boulevard

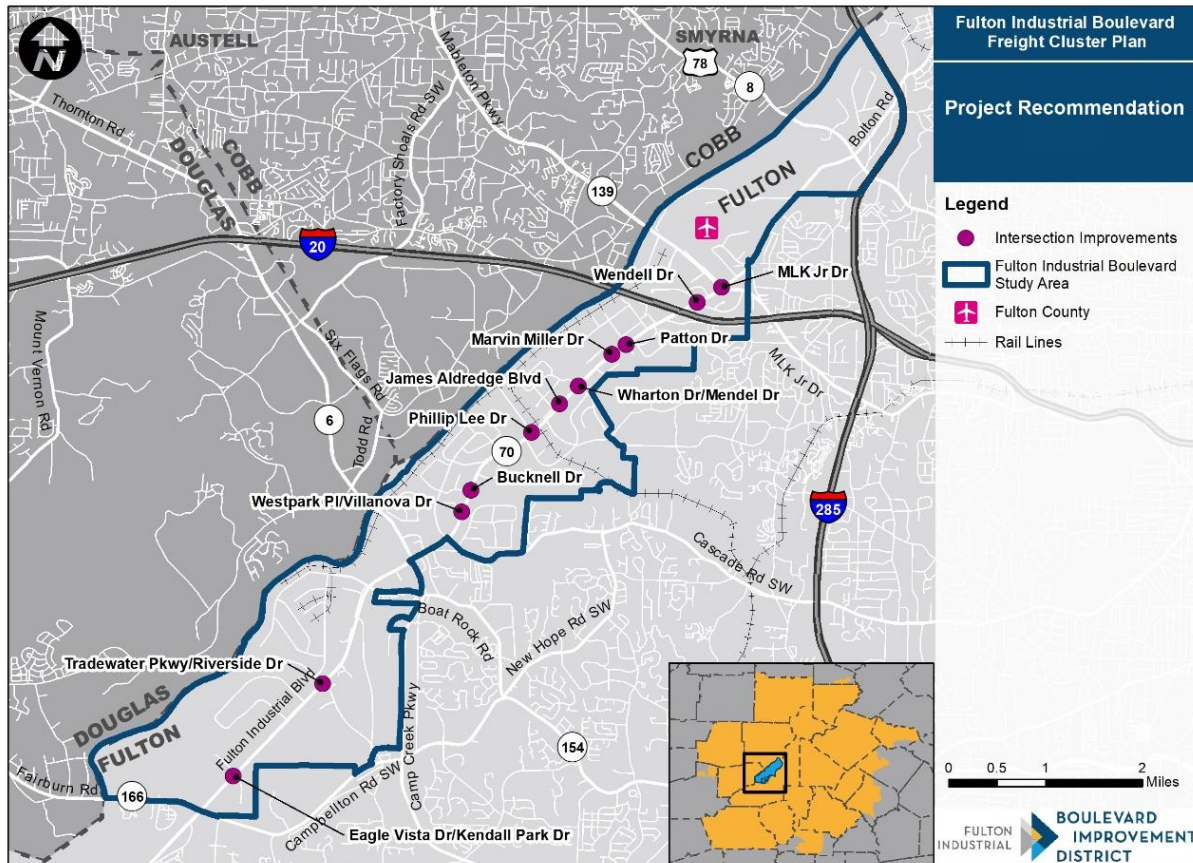


Figure 3-5. Proposed Improvements at the Tradewater Parkway/Riverside Drive Intersection (FIB-4)

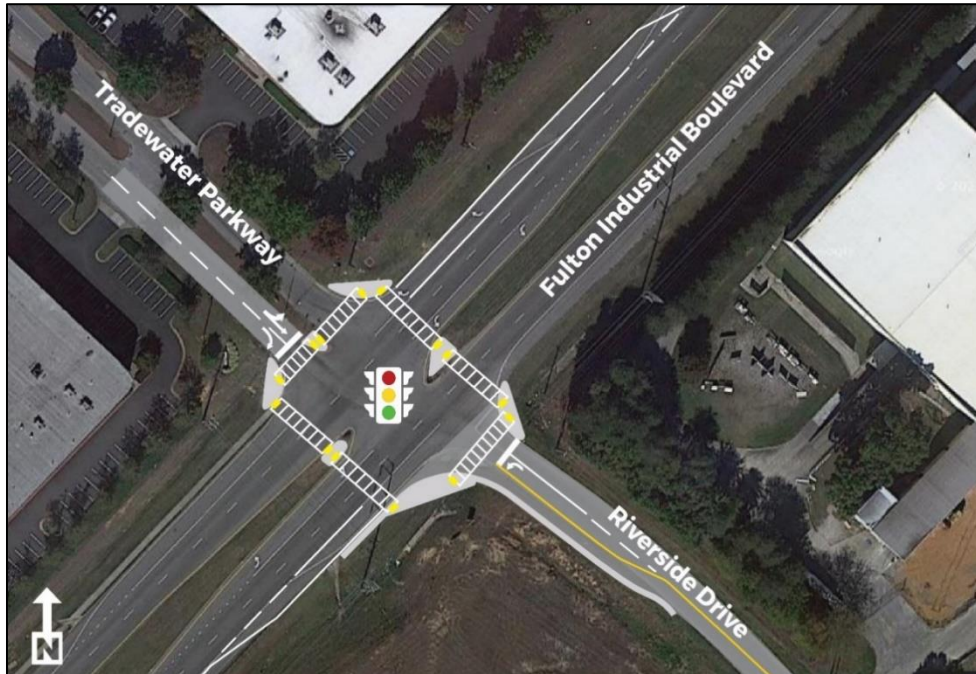


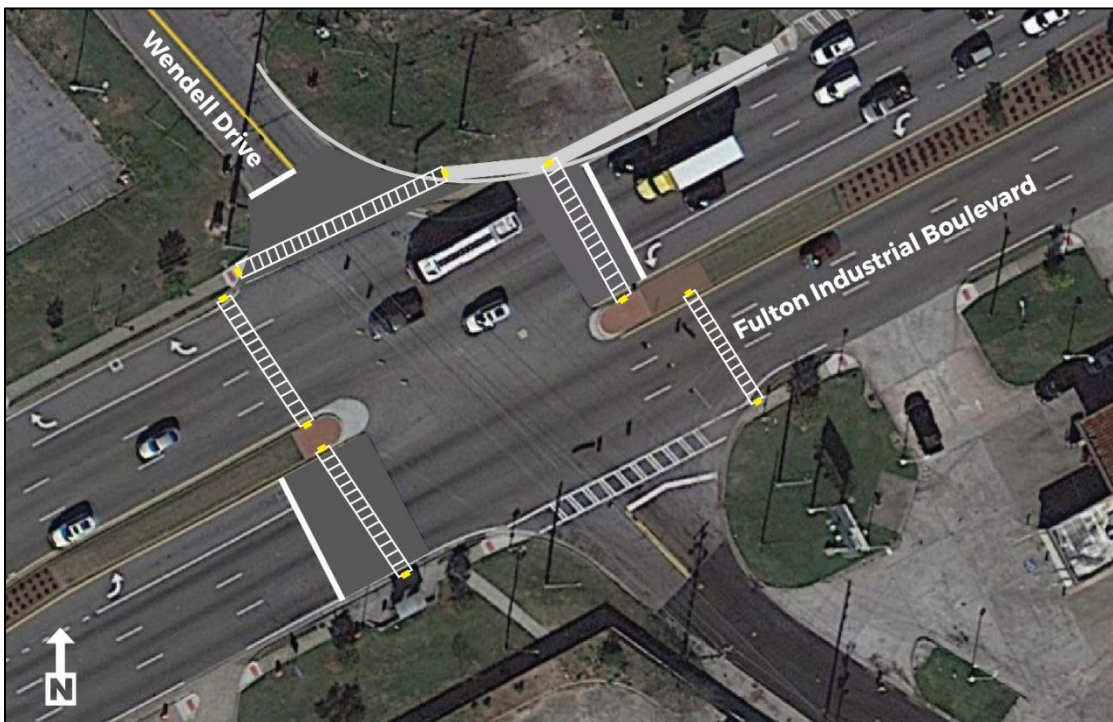
Figure 3-6. Proposed Improvements at the Patton Drive Intersection (FIB-6)



Figure 3-7. Proposed Improvements at the Martin Luther King Jr. Drive Intersection (FIB-7)



Figure 3-8. Proposed Improvements at the Wendell Drive Intersection (FIB-8)



Project Name (ID): Pedestrian Infrastructure on Fulton Industrial Boulevard (Multiple Projects)

Project Purpose: These projects will improve safety and comfort for pedestrians travelling along SR 70/Fulton Industrial Boulevard. Specifically, the projects will improve the commutes for employees in the district who use MARTA Bus Route 73 by connecting bus stops with workplaces.

Project Description: Complete sidewalk network along both sides of SR 70/Fulton Industrial Boulevard by installing five-foot-wide sidewalks with a buffer from the roadway and crosswalks across all side streets. The completion of the whole set of projects would result in 13.48 linear miles of sidewalks, 31 painted crosswalks, and 1 pedestrian hybrid beacon across SR 70/Fulton Industrial Boulevard at Westlake Boulevard.

Sidewalk improvements have been broken into five projects to be eligible for ARC TIP funding. The projects are numbered in order of priority. The projects are as follows:

- ▶ FIB-17: Between I-20 and Selig Drive.
- ▶ FIB-18: Between Selig Drive and SR 6/Camp Creek Parkway. FIB-7A and FIB-7B are the highest priority segments due to the need for pedestrian connections to bus stops and a high number of pedestrian crashes along these segments.
- ▶ FIB-19: Between SR 6/Camp Creek Parkway and Tradewater Parkway/Riverside Drive. This is next in terms of priority due to the bus stops along the segment.
- ▶ FIB-20: Between Tradewater Parkway/Riverside Drive and SR 154/SR 166/Campbellton Road. As part of FIB-9A, this segment will have bus stops that need accompanying sidewalks.
- ▶ FIB-21: Between I-285 and I-20. This segment is lowest in priority due to the existing presence of sidewalks on a majority of the segment and the lack of bus stops on SR 70/Fulton Industrial Boulevard north of SR 139/Martin Luther King Jr. Drive.

These phases can be combined in a number of ways, up to a single project, depending on these desired funding source. Ultimately, the number of phases and order of implementation is up to the discretion of the Boulevard CID.

Probable Cost Estimate:

- ▶ FIB-17: Approximately \$3,901,000
- ▶ FIB-18: Approximately \$3,630,000
- ▶ FIB-19: Approximately \$3,200,000
- ▶ FIB-20: Approximately \$2,291,000
- ▶ FIB-21: Approximately \$2,325,000
- ▶ The cost estimate was developed using the ARC Cost Estimation tool, engineering judgment, and input from roadway engineers and planners. It reflects the major project components such as sidewalks and context sensitive pedestrian crossings.
- ▶ Includes typical phases/components such as PE, ROW, UTL, engineering inspection, CST and contingency.

Project Competitiveness:

This project will be competitive for several federal funding sources through application to ARC's TIP. Appropriate funding sources include portions of the BIL program that have existed in the past but now have either a new focus or additional funding for new purposes. For example, the HSIP now has enhanced funding for non-motorized transportation improvements such as roadway separations between vehicles and pedestrians, and the Active Infrastructure Investment Program is a new competitive grant for projects that provide an active transportation network or spine. This sidewalk implementation project will serve the employees along the corridor who travel by bus and currently do not have pedestrian connections between bus stops and businesses. The project will improve safety for employees and is also likely to attract additional businesses with an environment friendly to transit commuters.

Potential Challenges:

- ▶ The project cost includes the conversion of the SR 70/Fulton Industrial Boulevard shoulder to a sidewalk with a curb on both sides on the bridge crossing over Utoy Creek. This is likely the most cost-effective option for pedestrian accommodations across the creek, however, it may not be the most comfortable for pedestrians, as they will be walking close to the roadway. Other alternatives, such as pedestrian bridges, can be considered, but will likely cost significantly more.

Other Information to Support Project:

- ▶ A Pedestrian Crossing Review was conducted at the intersection of SR 70/Fulton Industrial Boulevard and Westlake Boulevard in August 2020. The study concluded that due to the MARTA bus stop across from Westlake Boulevard, a pedestrian hybrid beacon should be considered to improve pedestrian safety for riders crossing to and from the bus stop.

Concept Level Drawing

An example section of what pedestrian infrastructure along SR 70/Fulton Industrial Boulevard will look like is shown in [Figure 3-9](#).

Figure 3-9. Example Section of Proposed Pedestrian Infrastructure on Fulton Industrial Boulevard at Villanova Drive/Westpark Place (Part of FIB-18)



4 RECOMMENDATIONS

The project team has developed a list of recommendations to address the challenges identified through the analysis of existing conditions, anticipated growth in freight traffic in the FID, and stakeholder support. These recommendations are in the form of both projects and policies that will benefit the FID and help maintain its economic competitiveness. The Freight Cluster Plan serves as a framework for the FID, with the aim of guiding the Boulevard CID to initiation of these recommendations in partnership with other agencies.

The recommendations are divided into timeframes for implementation based on prioritization results and anticipated revenue availability. The Financially Feasible Short-Term Action Plan includes projects that can be implemented within a 10-year timeframe and is based primarily on anticipated revenue for the Boulevard CID. It is further divided into projects with a timeframe of either one to five years or six to ten years. This Plan does not assume that the projects will be completed in these timeframes; rather, these projects can be started or at the very least funding can be secured for these projects within the designated timespan. The Long-Term Vision Recommendation List is fiscally unconstrained and includes recommendations that will be initiated past the 2031 horizon. This section further details these groups of recommendations. Project sheets with more information for each recommendation can be found in [Appendix B](#).

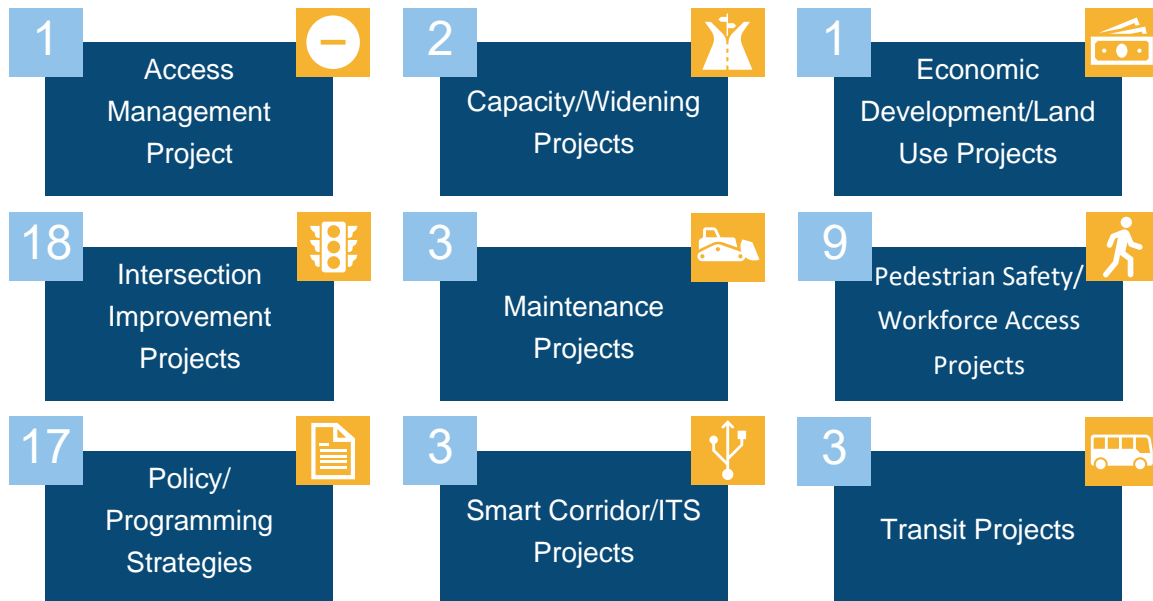
Additionally, within the Short-Term Action Plan, several recommendations have been identified as Tier 1, high priority projects. These projects were the highest performing during the prioritization step and should be considered for implementation sooner than other projects in that timeframe. These projects are highlighted in gold in the tables throughout this section.

In total, the FCP recommends 57 projects and policies that fall into nine categories. This includes 38 recommendations in the Short-Term Action Plan (33 recommendations in Years one through five and 5 recommendations in Years six through ten) and 19 recommendations in the Long-Term Vision Recommendation List. 22 of the total recommendations are designated as Tier 1.

4.1 Recommendation Categories

The 57 project recommendations fall into nine categories, as shown in [Figure 4-1](#) and described below (the numerals in the figure indicate the number of projects in each category).

Figure 4-1. Project Recommendation Categories and Breakdown



Access Management projects seek to reduce crashes and traffic delays associated with driveway turning movements. These projects also seek to address freight vehicle access to vehicle parking and staging areas throughout the FID.

Capacity/Widening projects add physical space to the roadway by increasing the number of travel lanes or otherwise reconfiguring the right of way to increase vehicle throughput.

Economic Development/Land Use initiatives focus on policy recommendations that permit workforce supportive amenities such as restaurants and commercial services and encourage alternative fuel use such as solar panels and electric vehicle charging opportunities.

Intersection improvement projects aim to address safety issues, such as vehicle crashes and pedestrian injuries, and operational issues, such as poor signal timing and insufficient turn radii.

Maintenance initiatives seek to preserve the existing transportation infrastructure in the FID.

Pedestrian Safety/Workforce Supportive projects will add infrastructure to increase pedestrian separation from vehicle traffic and increase visibility for pedestrians. These projects will seek to improve workers' access to job sites and transit facilities within the study area.

Policy/Programming recommendations are largely policy and programmatic strategies that will coordinate employee commutes more effectively.

Smart Corridor/ITS projects aim to utilize connected signal technology and ITS advancements to improve safety and operational efficiency. New systems can improve traffic flow, reduce the need for sudden stops, and introduce real time notifications about construction and parking availability. For prospective tenants, they also enhance the appeal of the FID as an up-to-date facility with modern features.

Transit projects aim to both increase transit accessibility within the FID and improve the experience of riding transit where infrastructure and routes already exist.

4.2 Suggested Funding Source and Potential Project Champion

The project team identified a Suggested Funding Source and Potential Project Champion for each recommendation. These are defined as follows:

The **Suggested Funding Source** was determined to be the best possible funding source based on the type, magnitude, and timeframe of each recommendation. However, this is not the only possible funding source for each recommendation. See [Appendix A](#) for a complete list of all possible funding sources for each recommendation.

The **Potential Project Champion** is the agency that Boulevard CID would likely want to partner with to pursue the Suggested Funding Source. This may be the agency that controls the funding source, the agency that has jurisdiction over the project location, or an agency that is eligible to apply for the funding source.

4.3 Financially Feasible Short-Term Action Plan (Years 1-10)

The Financially Feasible Short-Term Action Plan is a ten-year fiscally constrained list of recommended projects and policies based on anticipated Boulevard CID revenues. Project funding feasibility assumes partnerships between the CID and local jurisdictions, and the timescale of delivery is dependent on funding partners. For projects eligible for federal funding, the CID's local match is assumed at 20 percent of the total project cost.

4.3.1 Short-Term Action Plan (Years 1-5)

Table 4-1 lists the recommendations in the Financially Feasible Short-Term Action Plan that can be initiated on a timescale of one to five years. The physical projects that are part of this list are mapped in **Figure 4-2**. Projects highlighted in gold are the highest priority.

Table 4-1. Recommendations for Short-Term Action Plan Years 1-5

ID	Project Name	Project Type	Suggested Funding Source	Potential Project Champion	Description	Total Cost	Local Match	Remaining Cost
FIB-1	Intersection Improvements at Fulton Industrial Boulevard and Donald L. Hollowell Parkway	Intersection Improvement	ARC TIP	City of Atlanta	Improved sidewalks and pedestrian access, pedestrian lighting, trees, and a landscaped median along Fulton Industrial Boulevard. Addition of dual left-turn lanes on Fulton Industrial Boulevard northbound and Donald L. Hollowell Parkway westbound.	\$4,450,000	\$890,000	\$3,560,000
FIB-2	Intersection and Operational Improvements at Fulton Industrial Boulevard and Westgate Parkway (North and South)	Intersection Improvement	GDOT Operational Improvement Lump Sum	GDOT	Signal installation with crosswalks at southern intersection and installation of RCUT at northern intersection. Turning radius increase at west corner of northern intersection and north corner of southern intersection.	\$933,000	-	\$933,000
FIB-3	Intersection Improvements at Fulton Industrial Boulevard and I-20 Ramps	Intersection Improvement	GDOT SigOps Program	GDOT	GDOT's SigOps program is currently scheduled to retime 18 intersections on Fulton Industrial Boulevard, including the intersections with both I-20 ramps. The cost to retime the whole corridor is \$107,000, and the cost for the two I-20 intersections is \$11,890. After the system has been retimed, SigOps will actively manage the signal systems. Although the signal timing for the whole corridor will be adjusted, the retiming at the I-20 ramps in particular will address location-specific needs identified at the high-priority intersection of Fulton Industrial Boulevard with I-20.	\$11,890	-	\$11,890

ID	Project Name	Project Type	Suggested Funding Source	Potential Project Champion	Description	Total Cost	Local Match	Remaining Cost
FIB-4	Intersection Improvements at Fulton Industrial Boulevard and Tradewater Parkway/Riverside Drive	Intersection Improvement	GDOT Freight Operations Lump Sum	GDOT	Install a traffic signal with crosswalks at the Tradewater Parkway/Riverside Drive intersection, add a left turn lane on the westbound approach, restripe eastbound approach to thru/left and right turn only, extend northbound right turn lane to 175 ft with 100 ft taper, extend southbound left turn lane to 235 ft with 100 ft taper, and increase turning radius at south corner of intersection.	\$1,391,000	-	\$1,391,000
FIB-5	Intersection Improvements at Fulton Industrial Boulevard and Westpark Place/Villanova Drive	Intersection Improvement	Local Municipal Funds	City of South Fulton	Conduct a signal warrant analysis at the Westpark Place/Villanova Drive intersection.	\$25,000	\$5,000	\$20,000
FIB-6	Intersection Improvements at Fulton Industrial Boulevard and Patton Drive	Intersection Improvement	GDOT Freight Operations Lump Sum	GDOT	Add a second left turn lane on Fulton Industrial Boulevard at Patton Drive in the northbound direction, widen the eastbound approach of Patton Drive to two lanes (a thru/left and a right turn lane), improve turning radius at north corner by creating a consistent curve.	\$1,387,000	-	\$1,387,000
FIB-7	Intersection Improvements at Fulton Industrial Boulevard and Martin Luther King Jr. Drive	Intersection Improvement	GDOT Freight Operations Lump Sum	GDOT	Add a southbound thru lane on Fulton Industrial Boulevard at the Martin Luther King Jr. Drive intersection.	\$1,555,000	-	\$1,555,000
FIB-8	Intersection Improvements at Fulton Industrial Boulevard and Wendell Drive	Intersection Improvement	GDOT Freight Operations Lump Sum	GDOT	Increase turning radius on north corner of Wendell Drive intersection, push back stop bar on Wendell Drive southbound, install pedestrian crosswalks and signals.	\$521,000	-	\$521,000
FIB-9	Intersection Improvements at Fulton Industrial Boulevard and Wharton Drive/Mendel Drive	Intersection Improvement	GDOT Freight Operations Lump Sum	GDOT	Increase turning radius on north corner of Wharton Drive/Mendel Drive intersection	\$450,000	-	\$450,000

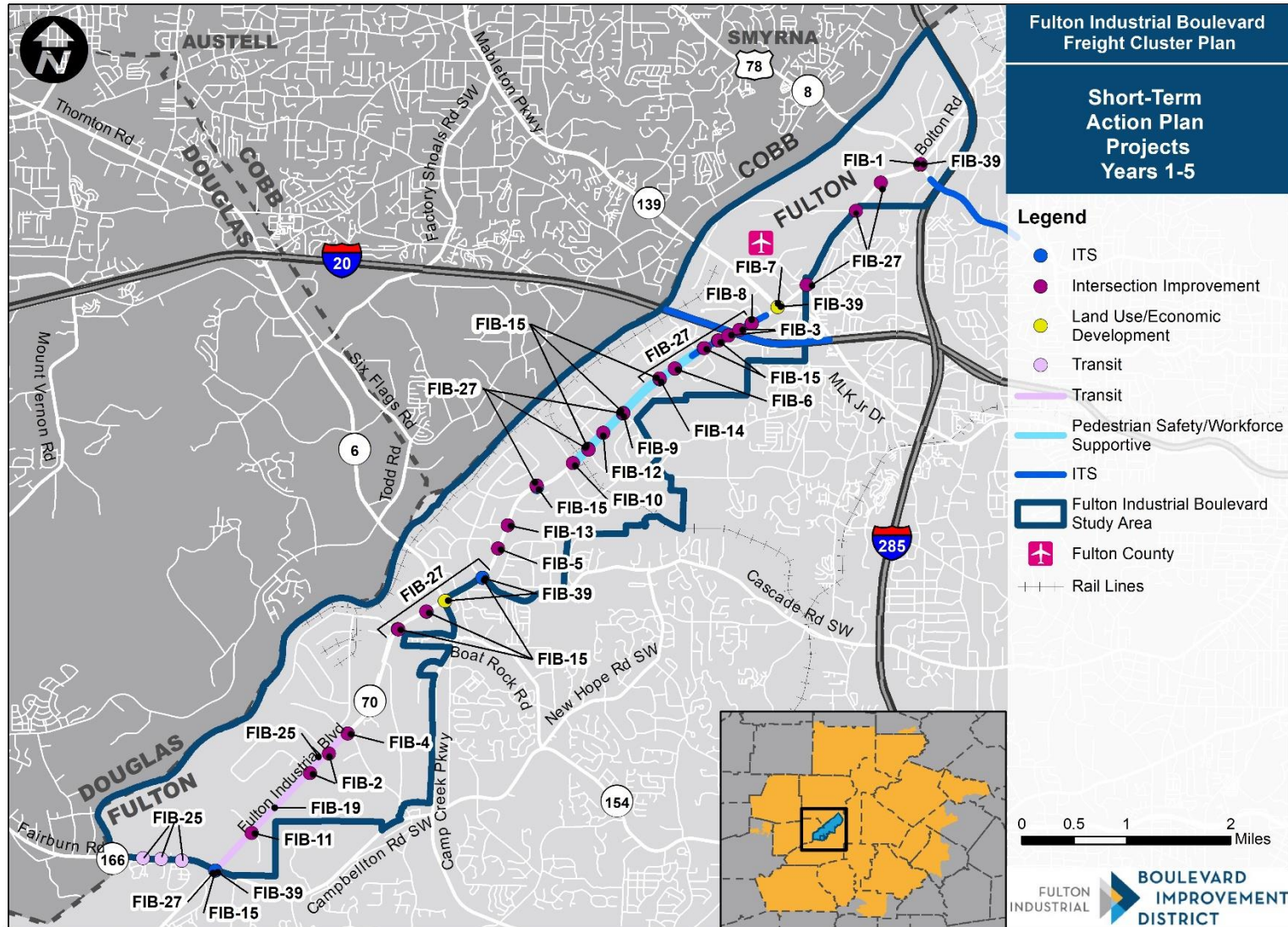
ID	Project Name	Project Type	Suggested Funding Source	Potential Project Champion	Description	Total Cost	Local Match	Remaining Cost
FIB-10	Intersection Improvements at Fulton Industrial Boulevard and Phillip Lee Drive	Intersection Improvement	GDOT Freight Operations Lump Sum	GDOT	Increase turning radius on north corner of Phillip Lee Drive intersection.	\$450,000	-	\$450,000
FIB-11	Intersection Improvements at Fulton Industrial Boulevard and Eagle Vista Drive/Kendall Park Lane	Intersection Improvement	GDOT Freight Operations Lump Sum	GDOT	Increase turning radii on all corners of Eagle Vista Drive/Kendall Park Lane intersection.	\$1,350,000	-	\$1,350,000
FIB-12	Intersection Improvements at Fulton Industrial Boulevard and James Aldredge Boulevard	Intersection Improvement	GDOT Freight Operations Lump Sum	GDOT	Increase turning radius at north corner of James Aldredge Boulevard intersection.	\$450,000	-	\$450,000
FIB-13	Intersection Improvements at Fulton Industrial Boulevard and Bucknell Drive	Intersection Improvement	GDOT Freight Operations Lump Sum	GDOT	Increase turning radii on all corners of Bucknell Drive intersection.	\$1,350,000	-	\$1,350,000
FIB-14	Intersection Improvements at Fulton Industrial Boulevard and Marvin Miller Drive	Intersection Improvement	GDOT Freight Operations Lump Sum	GDOT	Increase turning radius on north corner of Marvin Miller Drive intersection.	\$450,000	-	\$450,000
FIB-15	Connected Vehicle Infrastructure on Fulton Industrial Boulevard	Smart Corridor/ ITS	GDOT Traffic Operations	GDOT	Outfit existing traffic signals along Fulton Industrial Boulevard from Shirley Way to Campbellton Road, excluding Camp Creek Parkway (11 signals total) with connected vehicle infrastructure, providing capabilities for Emergency Vehicle Priority, Transit Signal Priority, and Freight Signal Priority.	\$2,255,000	\$451,000	\$1,804,000
FIB-16	Smart Work Zones Adjacent to Major Roadway Projects	Smart Corridor/ITS	BIL SMART Grant Program	GDOT	Install ITS devices near project locations to connect freight vehicles in-cab. Include provisions in GDOT's Maintenance of Traffic (MOT) plans for the Donald L. Hollowell and I-20/I-285 West Interchange projects. Devices will be located on I-20, Fulton Industrial Boulevard, and Donald L. Hollowell Parkway.	\$150,000	\$30,000	\$120,000

ID	Project Name	Project Type	Suggested Funding Source	Potential Project Champion	Description	Total Cost	Local Match	Remaining Cost
FIB-17	Pedestrian Infrastructure on Fulton Industrial Boulevard Between I-20 and Selig Drive	Pedestrian Safety/ Workforce Supportive	ARC TIP	City of South Fulton	Complete sidewalk network along both sides of Fulton Industrial Boulevard between I-20 and Selig Drive by installing five-foot sidewalks with a buffer from the roadway and crosswalks across all side streets, along with 2 crosswalks across Fulton Industrial Boulevard at Bakers Ferry Road. Total of 3.45 linear miles of sidewalks and 13 painted crosswalks.	\$3,901,000	\$780,200	\$3,120,800
FIB-25	Extend Marta Bus Route 73 South to Campbellton Road	Transit	MARTA Operations and Maintenance Budget	MARTA	Extend MARTA Bus Route 73 south to Campbellton Road and west along Campbellton Road to Chattahoochee River. Could potentially include loop around Westgate Parkway. Add bus stops to serve Westgate Parkway, Fastenal, West Fulton Commerce Park, Bosch, Eagle Vista Parkway, Kendall Park Lane, Chattahoochee Logistics Center, Anatole Housing Development, Manheim, and The Park at Riverview/Harmony Park. To better serve employees who live southwest of the CID, potentially extend service further to the southwest along Cochran Mill Road.	\$335,000	\$67,000	\$268,000
FIB-26	Pedestrian Crossings for MARTA Bus Route 73 Extension	Transit	GDOT Transportation Alternatives Program (TAP) Lump Sum	MARTA	Install Pedestrian Hybrid Beacons at three locations to connect the proposed bus stops on Campbellton Road.	\$165,000	\$33,000	\$132,000
FIB-27	Supplemental Signal Heads on Fulton Industrial Boulevard	Intersection Improvement	GDOT Signal Upgrades Lump Sum	GDOT	Install supplemental near-side signal heads to assist drivers behind large trucks at all 20 traffic signals along the Fulton Industrial Boulevard corridor between Donald L. Hollowell Parkway and Campbellton Road.	\$2,000,000	-	\$2,000,000
FIB-39	Gateway/ Wayfinding Signage	Economic Development/ Land Use	SRTA GTIB	Boulevard CID	Install FID gateway/wayfinding signage at key intersections along the corridor, including Camp Creek Parkway, Great Southwest Pkwy/Cascade Road, and Martin Luther King Jr. Drive., Donald Lee Hollowell/FIB, I-285/DLH, Campbellton Road/FIB	\$500,000	\$100,000	\$400,000

ID	Project Name	Project Type	Suggested Funding Source	Potential Project Champion	Description	Total Cost	Local Match	Remaining Cost
FIB-56	Speed Limit Reduction on Fulton Industrial Boulevard	Pedestrian Safety/ Workforce Supportive	GDOT Traffic Operations	GDOT	Reduce speed limit to 35 mph on Fulton Industrial Boulevard from Mendel Drive/Wharton Drive to Patton Drive to reduce pedestrian fatalities.	\$1000	\$200	\$800
Policies								
FIB-34	Expand Electric Vehicle Charging	Policy/ Programming	-	Boulevard CID	Create a subcommittee including Georgia Power and CID stakeholders to identify locations for public electric vehicle charging stations. Once locations have been identified, converse with the state to secure funding.	\$0	\$0	\$0
FIB-35	Emergency Procedures for Critically Vulnerable Transportation Assets	Policy/ Programming	CID Funds	Boulevard CID	Develop emergency procedures for critically vulnerable transportation assets in the FID in the case of events such as floods or terrorism and establish relationships between organizations and individuals in the FID.	TBD	TBD	TBD
FIB-41	District Branding to City Officials, developers, brokers and Stakeholders	Policy/ Programming	CID Funds	Boulevard CID	Host periodic tours for stakeholders and city officials showcasing a different industry or innovation each time. Provide handouts on key FID facts and figures.	TBD	TBD	TBD
FIB-43	Participate in Regional Off-Peak Initiatives	Policy/ Programming	-	Boulevard CID	Participate in any regional initiatives to address off-peak freight deliveries.	\$0	\$0	\$0
FIB-44	Introduction of Amenities to Support Workforce	Policy/ Programming	CID Funds	Boulevard CID	Partner with the City of South Fulton to gather demographics to support the opening of amenities in the FID. These may include restaurants, retail, dry cleaners, banks, etc.	TBD	TBD	TBD
FIB-45	Encourage the Development of Ghost Kitchens in the FID	Policy/ Programming	-	Boulevard CID	Ghost Kitchens are food preparation/cooking facilities used to prepare delivery-only meals and may host kitchen space for multiple restaurant brands. This would provide quick food delivery options for employees in the FID. Steps to encourage development of these facilities include identification of potential locations, revised zoning to allow for food service, and partnerships with food delivery services.	\$0	\$0	\$0
FIB-46	Encourage Restaurant Events in the FID	Policy/ Programming	CID Funds	Boulevard CID	Encourage food truck event producers to hold "Food Truck Fridays" in the District.	TBD	TBD	TBD
FIB-47	Solar Panel Showcase	Policy/ Programming	-	Boulevard CID	Encourage the installation of solar panels by showcasing existing case studies (e.g. Miller Zell).	\$0	\$0	\$0

ID	Project Name	Project Type	Suggested Funding Source	Potential Project Champion	Description	Total Cost	Local Match	Remaining Cost
FIB-51	Commute Assistance Program	Policy/ Programming	Georgia Commute Options Funds	Georgia Commute Options	Partner with Georgia Commute Options to educate employers and employees about transportation options, coordinate carpools/vanpools, and coordinate micromobility.	TBD	TBD	TBD
FIB-52	Carpool/Vanpool Programs	Policy/ Programming	Georgia Commute Options Funds	Georgia Commute Options	Supplemental measures to promote carpools and vanpools developed through Georgia Commute Options. This includes branded preferential carpool parking, with larger employers receiving signage for parking spaces only for carpool vehicles in preferred locations and employers subsidizing vanpool rentals.	TBD	TBD	TBD
FIB-53	Discounted MARTA Passes	Policy/ Programming	-	Boulevard CID	Encourage businesses to work with MARTA to purchase discounted MARTA passes. Also, aggregate purchases from smaller employers to increase discount.	\$0	\$0	\$0
Total						\$24,080,890	\$2,356,400	\$21,724,490

Figure 4-2. Short-Term Action Plan Projects for Years 1-5



4.3.2 Short-Term Action Plan (Years 6-10)

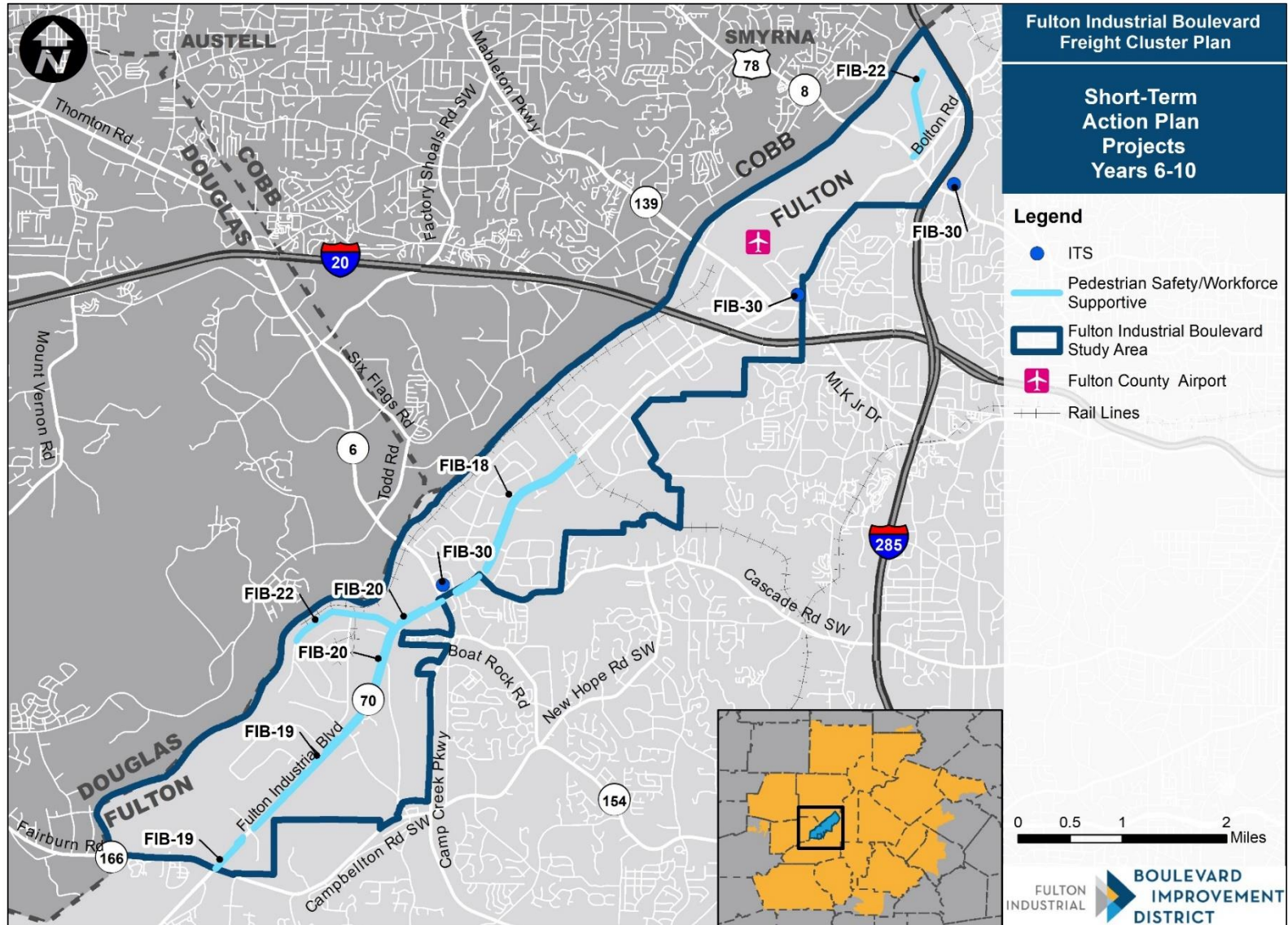
Table 4-2 lists the recommendations in the Financially Feasible Short-Term Action Plan that can be initiated on a timescale of six to ten years. These projects are mapped in **Figure 4-3**. Projects highlighted in gold are the highest priority.

Table 4-2. Recommendations for Short-Term Action Plan Years 6-10

ID	Project Name	Project Type	Suggested Funding Source	Potential Project Champion	Description	Total Cost	Local Match	Remaining Cost
FIB-18	Pedestrian Infrastructure on Fulton Industrial Boulevard Between Selig Drive and Camp Creek Parkway	Pedestrian Safety/ Workforce Supportive	ARC TIP	City of South Fulton	Complete sidewalk network along both sides of Fulton Industrial Boulevard between Selig Drive and Camp Creek Parkway by installing five-foot sidewalks with a buffer from the roadway and crosswalks across all side streets. Total of 3.05 linear miles of sidewalks and 10 painted crosswalks. Includes conversion of shoulder of bridge over Utoy Creek to a five-foot sidewalk with curb and fence.	\$3,690,000	\$738,000	\$2,952,000
FIB-19	Pedestrian Infrastructure on Fulton Industrial Boulevard Between Camp Creek Parkway and Tradewater Parkway/Riverside Drive	Pedestrian Safety/ Workforce Supportive	ARC TIP	City of South Fulton	Complete sidewalk network along both sides of Fulton Industrial Boulevard between Camp Creek Parkway and Tradewater Parkway/Riverside Drive by installing five-foot sidewalks with a buffer from the roadway and crosswalks across all side streets, along with a Pedestrian Hybrid Beacon across Fulton Industrial Boulevard at Westlake Boulevard. Total of 2.85 linear miles of sidewalks and 6 painted crosswalks.	\$3,200,000	\$640,000	\$2,560,000
FIB-20	Pedestrian Infrastructure on Fulton Industrial Boulevard Between Tradewater Parkway/Riverside Drive and Campbellton Road	Pedestrian Safety/ Workforce Supportive	ARC TIP	City of South Fulton	Complete sidewalk network along both sides of Fulton Industrial Boulevard between Tradewater Parkway/Riverside Drive and Campbellton Road by installing five-foot sidewalks with a buffer from the roadway and crosswalks across all side streets. Total of 2.05 linear miles of sidewalks and 2 painted crosswalks.	\$2,291,000	\$458,200	\$1,832,800

ID	Project Name	Project Type	Suggested Funding Source	Potential Project Champion	Description	Total Cost	Local Match	Remaining Cost
FIB-22	Pedestrian Infrastructure Connections to Employment Hubs Off of Fulton Industrial Boulevard	Pedestrian Safety/ Workforce Supportive	ARC TIP	City of South Fulton	Installation of five-foot sidewalks adjacent to the east side of Atlanta Industrial Parkway and the south side of Boat Rock Boulevard. Total of 1.95 miles and 4 painted crosswalks.	\$1,514,000	\$302,800	\$1,211,200
FIB-30	Truck Parking Wayfinding Signage	Smart Corridor/ITS	GDOT Freight Operations Lump Sum	GDOT	Install truck parking wayfinding signage to guide truck drivers to lots/staging areas such as Petro Stopping Center or QuickTrip Truck Parking. Work with lot owners to install technology to be able to show parking availability on signage/apps	\$420,000	-	\$420,000
Total						\$11,115,000	\$2,139,000	\$8,976,000

Figure 4-3. Short-Term Action Plan Projects for Years 6-10



4.4 Long-Term Vision Recommendation List

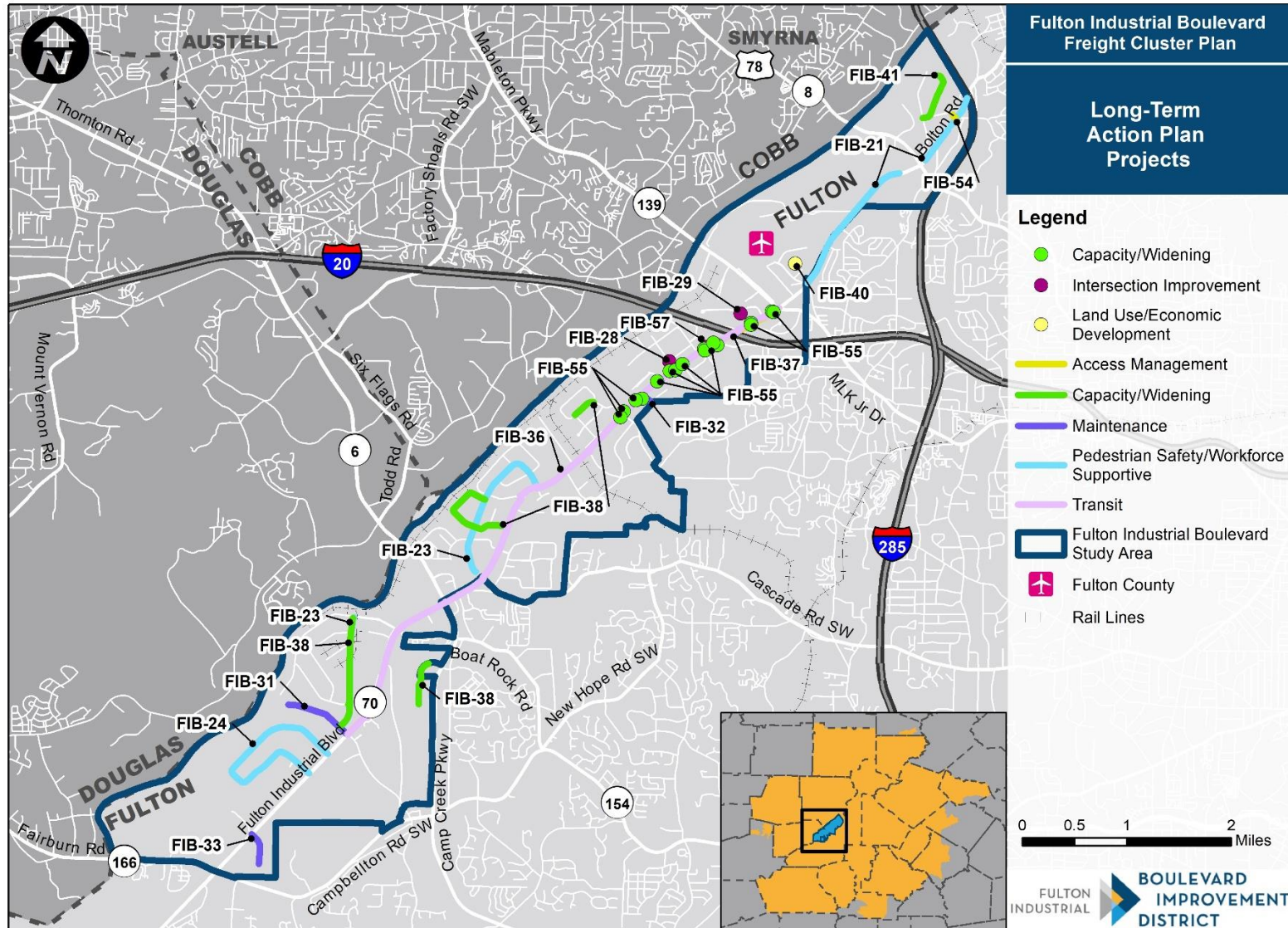
The Long-Term Vision Recommendation List is a fiscally unconstrained set of recommended projects and policies that can be implemented beyond the ten-year horizon presented in the Short-Term Action Plan. [Table 4-3](#) lists the recommendations that can be implemented after the year 2031. The physical projects that are part of this list are mapped in [Figure 4-4](#). Projects highlighted in gold are the highest priority.

Table 4-3. Long-Term Vision Recommendation List

ID	Project Name	Project Type	Suggested Funding Source	Potential Project Champion	Description	Total Cost
FIB-21	Pedestrian Infrastructure on Fulton Industrial Boulevard Between I-285 and I-20	Pedestrian Safety/ Workforce Supportive	ARC TIP	City of Atlanta	Complete sidewalk network along both sides of Fulton Industrial Boulevard between I-285 and I-20 by installing five-foot sidewalks with a buffer from the roadway and crosswalks across all side streets. Total of 2.08 linear miles of sidewalks and 2 painted crosswalks.	\$2,325,000
FIB-23	Pedestrian Infrastructure Connections to Fulton Industrial Boulevard	Pedestrian Safety/ Workforce Supportive	ARC TIP	City of South Fulton	Installation of five-foot sidewalks adjacent to the east/south side (inside) of Great Southwest Parkway and adjacent to the west side of Lagrange Boulevard. Total of 2.69 miles and 8 painted crosswalks.	\$2,085,000
FIB-24	Pedestrian Infrastructure Connections to Fulton Industrial Boulevard	Pedestrian Safety/ Workforce Supportive	ARC TIP	City of South Fulton	Installation of five-foot sidewalks adjacent to the south/east side (inside) of Westgate Parkway. Total of 2.16 miles.	\$1,669,000
FIB-28	Increase Intersection Turning Radii at Patton Drive and Mills Place	Intersection Improvement	Local Funds	City of South Fulton	Increase turning radii at north and east corners.	\$750,000
FIB-29	Increase Intersection Turning Radius at Wendell Drive and Interchange Drive	Intersection Improvement	Local Funds	City of South Fulton	Increase turning radius at east corner.	\$450,000
FIB-31	Tradewater Parkway Resurfacing	Maintenance	GDOT LMIG	City of South Fulton	Full-depth reclamation of the entirety of Tradewater Parkway	\$294,000
FIB-32	Robinson Drive Resurfacing	Maintenance	GDOT LMIG	City of South Fulton	Resurfacing the entirety of Robinson Drive	\$78,000

ID	Project Name	Project Type	Suggested Funding Source	Potential Project Champion	Description	Total Cost
FIB-33	Kendall Park Lane Resurfacing	Maintenance	GDOT LMIG	City of South Fulton	Resurfacing the entirety of Kendall Park Lane	\$234,000
FIB-36	Bus Stop Upgrades	Transit	MARTA Operations and Maintenance Budget	MARTA	Upgrade bus stops along Route 73 to include shelters, benches, signage, lighting, and trash receptacles. Also connect bus stops to sidewalk network. 74 bus stops need some type of upgrade.	\$1,232,000
FIB-38	Truck Staging Lanes on Shoulder	Capacity/Widening	Local Funds	City of South Fulton	Restripe roadways with wide lanes to incorporate a truck staging lane and buffer space on one side of the roadway. Example locations include Atlanta Industrial Parkway, Wharton Drive, Bucknell Drive, and Westlake Parkway. Also, restripe one lane on both sides of Lagrange Blvd for a truck staging lane. Striping will provide adequate distance from driveways to eliminate any sight distance issues.	TBD
FIB-54	Connect Atlanta Industrial Way to Bolton Road	Access Management	SRTA GTIB	City of Atlanta	Create a new connection to the Atlanta Industrial Park area by extending Atlanta Industrial Way to Bolton Road at the intersection with Northwest Drive.	\$546,000
FIB-55	Bus Pull-Out Lanes on Fulton Industrial Boulevard	Capacity/Widening	ARC TIP	GDOT/MARTA	Install bus pull-out lanes MARTA Route 73 where shoulders aren't present on Fulton Industrial Boulevard.	\$1,725,000
FIB-57	Intersection Realignment at Fulton Industrial Boulevard and Fulton Industrial Circle/ Commerce Drive	Intersection Improvement	GDOT Freight Operations Lump Sum	GDOT	Realign Fulton Industrial Circle and Commerce Drive to meet at a single, signalized intersection.	\$1,580,000
Policies						
FIB-37	Driveway Consolidation Along Fulton Industrial Boulevard	Policy/Programming	Developer or inclusion in nearby project cost	Developer	Include in the regulations for future redevelopments the consolidation of driveways along Fulton Industrial Boulevard to meet the standards in GDOT's Regulations for Driveway and Encroachment Control document, especially around the I-20 interchange.	TBD

Figure 4-4. Long-Term Vision Projects



5 IMPLEMENTATION STRATEGY

This plan, conducted through ARC's Freight Cluster Plan program, sets the framework for improvements in the area for years to come. The increase in freight traffic in the area, resulting from low vacancy rates and the addition of warehouse square footage, is putting pressure on the existing infrastructure of the FID and creating numerous challenges. The variety of project types is aimed at solving these challenges, ranging from projects that directly improve freight movement on roadways to policy changes that improve commuting experiences for employees in the area. Additionally, this Plan includes a number of projects that will introduce various new technologies to the area, thereby strengthening the FID as a modern logistical site.

The next step for the Boulevard CID is to meet with local jurisdictions including the City of South Fulton, City of Atlanta, Fulton County and GDOT to strategize an implementation timeline for the projects they want to pursue. The Financially Feasible Short-Term Action Plan was created to help the Boulevard CID and its partners visualize a timeframe for projects in the FID and anticipate what is needed to move these projects from plan to construction. The funding matrix included in [Appendix A](#) identifies potential funding sources that may be applied for each type of project. Meetings with other agencies, such as the City of Atlanta, GDOT, and Fulton County, are needed to secure funding and develop a strategy for delivery of projects. As projects progress, it will be important to continually engage stakeholders and the public to receive input throughout the planning, design, and construction phases.

While this plan provides actionable and detailed projects and phases, it is designed as a framework to guide the Boulevard CID and its partners and is intended to be flexible to accommodate new opportunities for funding and delivery as they arise. Changes in partner agency priorities and modifications of funding sources or amounts are a common reality; as such, this plan is structured in a way to be adaptable to multiple scenarios. For example, the City of South Fulton could prefer to implement pedestrian infrastructure sooner, and if it is able to replace some or all CID funding, these projects could move ahead in the timeline. The added uncertainty of the COVID-19 pandemic further emphasizes the need for a flexible plan. There isn't a set order in which to complete projects; rather, the CID can follow through with projects at its discretion. The Short-Term Action Plan along with the high-priority project list should act as a guideline, and not a definitive procedure for the CID.

The Fulton Industrial District is currently thriving in the region, with burgeoning businesses and new developments continuously being proposed and built in the district. With so many tenants, including many high-profile firms, it's hard to deny the impact of the FID on not only the Atlanta region but the whole Southeast. Increased demand for space in the FID shows the regional influence on the overall freight network in the state. The proposed projects put forth in this plan aim to build on this success and push the FID further, to the forefront of freight logistics. New ideas and technologies will help the FID stand out as a pioneer in the industry, while other projects will ensure the FID maintains a solid foundation to build upon. The recent expansion of the City of South Fulton presents a promising partnership that will be beneficial to both parties and the area as a whole. The FID is situated in a prime position at the moment, and this trend is likely to continue for many years to come.



FREIGHT CLUSTER PLAN

Appendix A: Potential Funding Matrix

		Federal (via ARC's TIP where indicated)										State							Local				
												GDOT						SRTA	ARC		Fulton County		
ID	Project Name	BIL: National Highway Performance Program (NHPP)	BIL: Surface Transportation Block Grant Program (STBG) -- via ARC's TIP	BIL: Highway Safety Improvement Program (HSIP)	BIL: Congestion Management and Air Quality Improvement Program (CMAQ) --via ARC's TIP	BIL: Active Transportation Infrastructure Investment Program	Strengthening Mobility and Revolutionizing Transportation (SMART) Grant Program	National Highway Freight Program (NHFP)	Rebuilding American Infrastructure with Sustainability and Equity (RAISE)	Infrastructure and Rebuilding America (INFRA Grant)	Accelerated Innovation Deployment Demonstration (AID)	Local Maintenance and Improvement Grant (LMIG)	Quick Response Funds	Operational Improvements Lump Sum	Signal Upgrades Lump Sum	Safety Improvements Lump Sum	Freight Operational Lump Sum Funding	Georgia Transportation Infrastructure Bank (GTIB)	Community Development Assistance Proram (CDAP) -- Staff assistance only	Livable Centers Initiative (LCI)	TSPLOST	MARTA	Public-Private Partnership
FIB-1	Intersection Improvements along Fulton Industrial Boulevard	x	✓	x	✓	x	x	✓	✓	✓	x	✓	x	✓	x	✓	✓	✓	x	x	x	x	x
FIB-2	Intersection and operational improvements at Fulton Industrial Boulevard and Westgate Pkwy (North and South)	x	✓	x	✓	x	x	✓	✓	✓	x	✓	x	✓	x	✓	✓	✓	x	x	x	x	x
FIB-3	Intersection Improvement at Fulton Industrial Boulevard and I-20 ramps (signal retiming)	x	x	x	✓	x	x	x	x	x	x	✓	x	✓	✓	x	x	x	x	x	x	x	x
FIB-4	Intersection improvements at Fulton Industrial Boulevard and DL Hollowell Pkwy	x	✓	✓	✓	x	x	x	x	x	x	✓	x	x	x	✓	x	✓	x	x	x	x	x
FIB-5	Connected Vehicle infrastructure	x	✓	x	x	x	✓	✓	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	x
FIB-6	Smart Work Zones adjacent to major roadway projects	x	✓	x	x	x	✓	x	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	x
FIB-7	Pedestrian Infrastructure on Fulton Industrial Boulevard	x	✓	x	x	✓	x	x	x	✓	x	✓	x	x	x	x	x	x	x	x	✓	x	x
FIB-8	Pedestrian Infrastructure Connections to Fulton Industrial Boulevard	x	✓	x	x	✓	x	x	x	✓	x	✓	x	x	x	x	x	x	x	x	✓	x	x
FIB-9	Extend Marta bus route 73 south to Campbellton Road	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	x
FIB-10	Supplemental signal heads	x	x	✓	x	x	x	x	✓	✓	✓	✓	x	x	✓	✓	✓	x	x	x	x	x	x
FIB-11	Increase intersection turning radii at Patton Drive at Mills Place	✓	✓	x	x	x	x	✓	✓		x	✓	✓	✓	x	✓	✓	x	x	x	x	x	x
FIB-12	Increase intersection turning radii at Wendell Drive at Interchange Drive	✓	✓	x	x	x	x	✓	✓	✓	x	✓	✓	✓	x	✓	✓	x	x	x	x	x	x
FIB-13	Truck parking wayfinding signage	x	✓	x	✓	x	✓	✓	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	✓
FIB-14	Tradewater Parkway Resurfacing	x	x	x	x	x	x	x	x	x	x	✓	x	x	x	x	x	x	x	x	x	x	x
FIB-15	Robinson Drive Resurfacing	✓	x	x	x	x	x	x	x	x	x	✓	x	x	x	x	x	x	x	x	x	x	x
FIB-16	Kendall Park Lane Resurfacing	✓	x	x	x	x	x	x	x	x	x	✓	x	x	x	x	x	x	x	x	x	x	x
FIB-17	Expand electric vehicle charging	✓	x	x	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
FIB-18	Emergency procedures for critically vulnerable transportation assets	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
FIB-19	Bus stop upgrades	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	✓
FIB-20	Driveway consolidation along Fulton Industrial Boulevard	x	x	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓
FIB-21	Truck staging lanes on shoulder	x	x	x	x	x	x	x	x	x	x	x	✓	x	x	x	x	x	x	x	x	x	✓
FIB-22	Gateway/Wayfinding Signage	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓
FIB-23	Create a sense of place around the Fulton County Airport	x	x	x	x	x	x	x	✓	✓	x	x	x	x	x	x	x	x	✓	✓	x	x	✓
FIB-24	Branding to city officials and stakeholders	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
FIB-25	Identify potential locations for truck parking facility	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	x	x	x	x	x	✓

		Federal (via ARC's TIP where indicated)										State							Local				
												GDOT							SRTA	ARC		Fulton County	
ID	Project Name	BIL: National Highway Performance Program (NHPP)	BIL: Surface Transportation Block Grant Program (STBG) -- via ARC's TIP	BIL: Highway Safety Improvement Program (HSIP)	BIL: Congestion Management and Air Quality Improvement Program (CMAQ) --via ARC's TIP	BIL: Active Transportation Infrastructure Investment Program	Strengthening Mobility and Revolutionizing Transportation (SMART) Grant Program	National Highway Freight Program (NHFP)	Rebuilding American Infrastructure with Sustainability and Equity (RAISE)	Infrastructure and Rebuilding America (INFRA Grant)	Accelerated Innovation Deployment Demonstration (AID)	Local Maintenance and Improvement Grant (LMIG)	Quick Response Funds	Operational Improvements Lump Sum	Signal Upgrades Lump Sum	Safety Improvements Lump Sum	Freight Operational Lump Sum Funding	Georgia Transportation Infrastructure Bank (GTIB)	Community Development Assistance Proram (CDAP) -- Staff assistance only	Livable Centers Initiative (LCI)	TSPLOST	MARTA	Public-Private Partnership
FIB-26	Participate in any regional off-peak initiatives	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓
FIB-27	Introduction of amenities to support workforce	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	x	x	✓
FIB-28	Encourage the development of Ghost Kitchens in the CID	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓
FIB-29	Sponsor restaurant events in the CID	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓
FIB-30	Encourage solar panel installation	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓
FIB-31	Planning considerations for Chattahoochee River Greenway, Proctor Creek Trail extension, and pedestrian connections	x	✓	✓	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	x	x	x
FIB-32	Microtransit for last-mile connections from bus stops	x	x	x	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓
FIB-33	Micromobility for last-mile connections from bus stops	x	x	x	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓
FIB-34	Commute Assistance Program	x	x	x	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓
FIB-35	Carpool/Vanpool programs	x	x	x	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓
FIB-36	Discounted MARTA passes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	✓
FIB-37	Connect Atlanta Industrial Way to Bolton Road	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	✓	x	x	x	x	x
FIB-38	Install bus pull out lanes	✓	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	✓	x	x	x	x	x	x
FIB-39	Speed Limit Reduction on Fulton Industrial Boulevard	x	x	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
FIB-40	Intersection realignment at Fulton Industrial Boulevard and Fulton Industrial Circle/Commerce Drive	x	✓	x	x	x	x	x	x	x	x	✓	✓	✓	x	x	✓	x	x	x	x	x	x



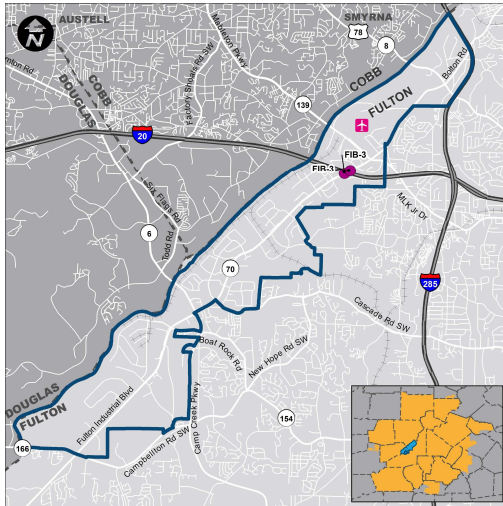
FREIGHT CLUSTER PLAN

Appendix B: Project Sheets

- Signal installation with crosswalks at southern intersection and installation of RCUT at northern intersection.
- Turning radii increases at west corner of northern intersection and north corner of southern intersection.

FIB-3: Intersection Improvements

Intersection Improvement at Fulton Industrial Boulevard and I-20 Ramps

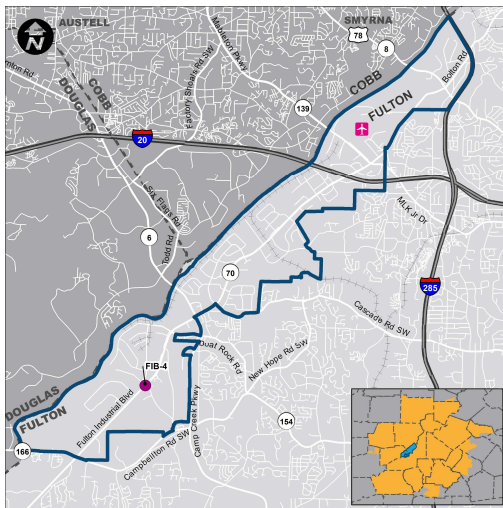


Cost Estimate	\$11,890
Suggested Funding Source	GDOT SigOps Program
Potential Project Champion	GDOT

- GDOT's SigOps program is currently scheduled to retim 18 intersection son Fulton Industrial Boulevard, including the intersection with both I-20 ramps, for \$107,000. After the system has been retimed, SigOps will actively manage the signal systems.
- Traffic signal optimization improves the flow of traffic and safety through a corridor or network. Traffic signal optimization is also an important traffic engineering strategy for reducing congestion.

FIB-4: Intersection Improvements

Intersection Improvements at Fulton Industrial Boulevard and Tradewater Parkway/Riverside Drive

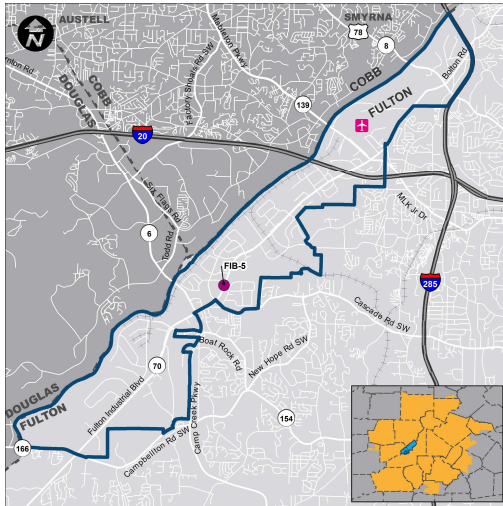


Cost Estimate	\$1,391,000
Suggested Funding Source	GDOT Freight Operations Lump Sum
Potential Project Champion	GDOT

- Install a traffic signal with crosswalks.
- Add a left turn lane on the westbound approach.
- Restripe eastbound approach to thru/left and right turn only.
- Extend northbound right turn lane to 175 ft with 100 ft taper.
- Extend southbound left turn lane to 235 ft with 100 ft taper.
- Increase turning radius at south corner of intersection.

FIB-5: Intersection Improvements

Intersection Improvements at Fulton Industrial Boulevard and Westpark Place/Villanova Drive

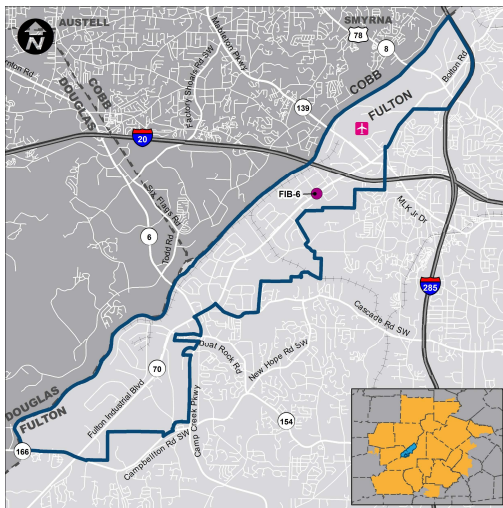


Cost Estimate	\$25,000
Suggested Funding Source	Local Funds
Potential Project Champion	City of South Fulton

- Conduct a signal warrant analysis at the Westpark Place/Villanova Drive intersection.

FIB-6: Intersection Improvements

Intersection Improvements at Fulton Industrial Boulevard and Patton Drive

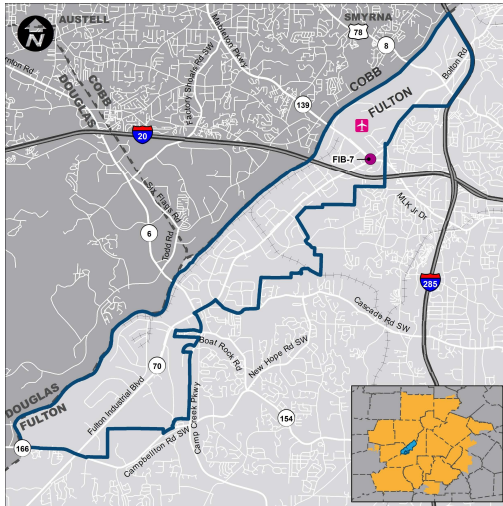


Cost Estimate	\$1,387,000
Suggested Funding Source	GDOT Freight Operations Lump Sum
Potential Project Champion	GDOT

- Add a second left turn lane on Fulton Industrial Boulevard in the northbound direction.
- Widen the eastbound approach of Patton Drive to two lanes (a thru/left and a right turn lane).
- Improve turning radius at north corner by creating a consistent curve.

FIB-7: Intersection Improvements

Intersection Improvements at Fulton Industrial Boulevard and Martin Luther King Jr. Drive

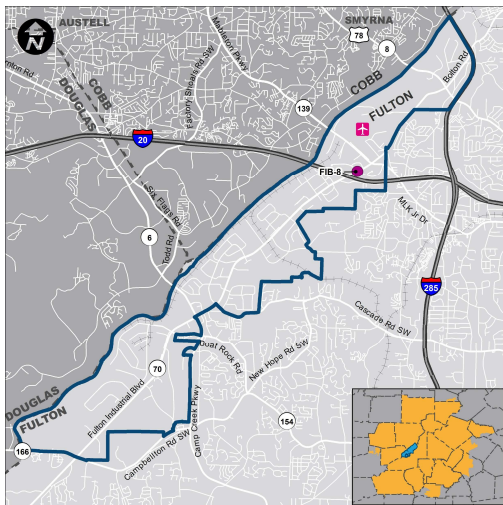


Cost Estimate	\$1,555,000
Suggested Funding Source	GDOT Freight Operations Lump Sum
Potential Project Champion	GDOT

- Add a southbound thru lane on Fulton Industrial Boulevard at the Martin Luther King Jr. Drive intersection.

FIB-8: Intersection Improvements

Intersection Improvements at Fulton Industrial Boulevard and Wendell Drive

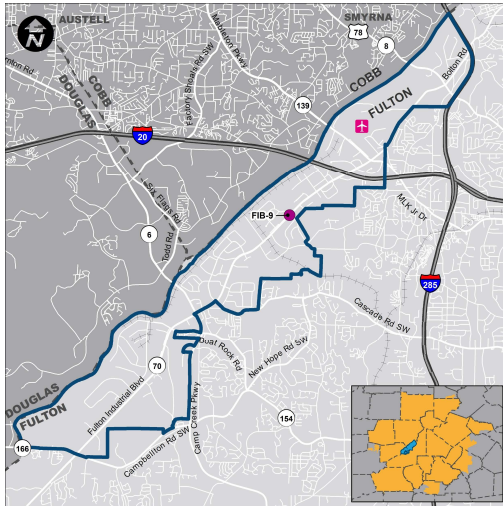


Cost Estimate	\$521,000
Suggested Funding Source	GDOT Freight Operations Lump Sum
Potential Project Champion	GDOT

- Increase turning radius on north corner of Wendell Drive intersection
- Push back stop bar on Wendell Drive eastbound
- Install pedestrian crosswalks and signals.

FIB-9: Intersection Improvements

Intersection Improvements at Fulton Industrial Boulevard and Wharton Drive/Mendel Drive

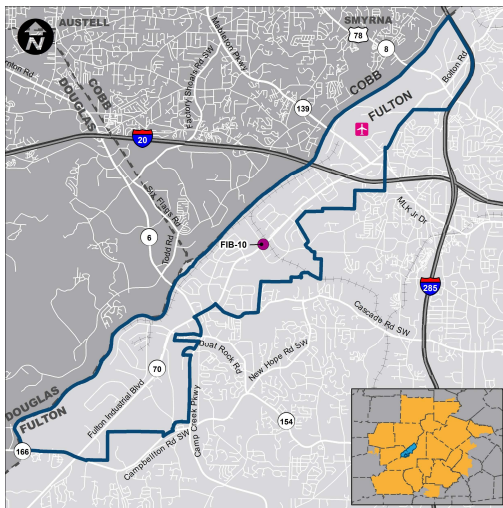


Cost Estimate	\$450,000
Suggested Funding Source	GDOT Freight Operations Lump Sum
Potential Project Champion	GDOT

- Increase turning radius on north corner of Wharton Drive/Mendel Drive intersection.

FIB-10: Intersection Improvements

Intersection Improvements at Fulton Industrial Boulevard and Phillip Lee Drive

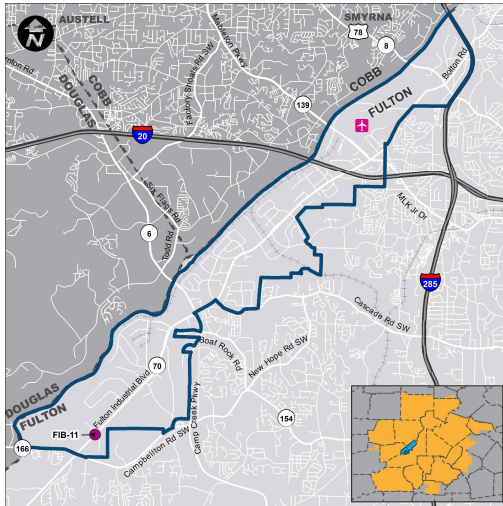


Cost Estimate	\$450,000
Suggested Funding Source	GDOT Freight Operations Lump Sum
Potential Project Champion	GDOT

- Increase turning radius on north corner of Phillip Lee Drive intersection.

FIB-11: Intersection Improvements

Intersection Improvements at Fulton Industrial Boulevard and Eagle Vista Drive/Kendall Park Lane

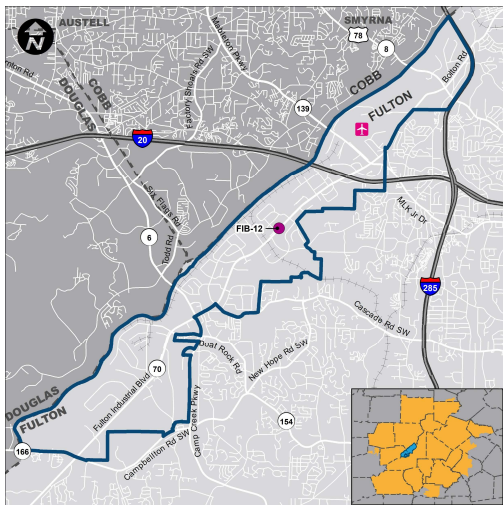


Cost Estimate	\$1,350,000
Suggested Funding Source	GDOT Freight Operations Lump Sum
Potential Project Champion	GDOT

- Increase turning radii on all corners of Eagle Vista Drive/Kendall Park Lane intersection.

FIB-12: Intersection Improvements

Intersection Improvements at Fulton Industrial Boulevard and James Aldredge Boulevard

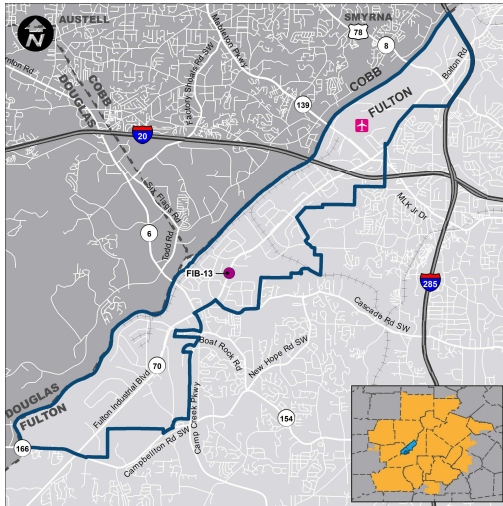


Cost Estimate	\$450,000
Suggested Funding Source	GDOT Freight Operations Lump Sum
Potential Project Champion	GDOT

- Increase turning radius at north corner of James Aldredge Boulevard intersection.

FIB-13: Intersection Improvements

Intersection Improvements at Fulton Industrial Boulevard and Bucknell Drive

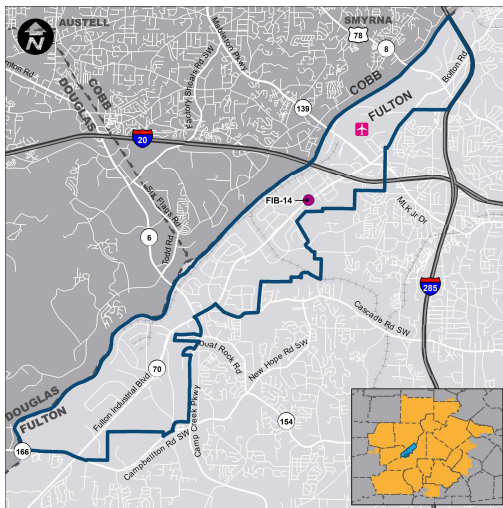


Cost Estimate	\$1,350,000
Suggested Funding Source	GDOT Freight Operations Lump Sum
Potential Project Champion	GDOT

- Increase turning radii on all corners of Bucknell Drive intersection.

FIB-14: Intersection Improvements

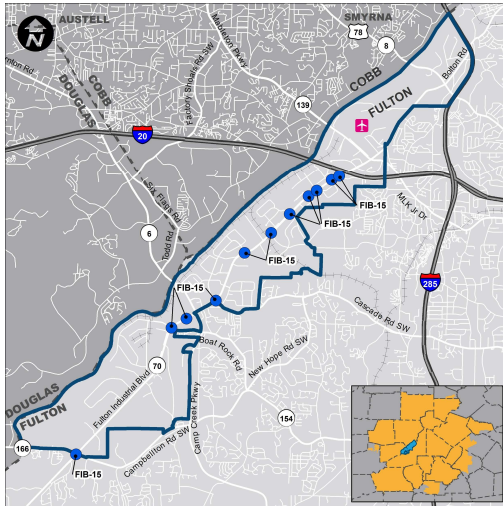
Intersection Improvements at Fulton Industrial Boulevard and Marvin Miller Drive



Cost Estimate	\$450,000
Suggested Funding Source	GDOT Freight Operations Lump Sum
Potential Project Champion	GDOT

- Increase turning radius on north corner of Marvin Miller Drive intersection.

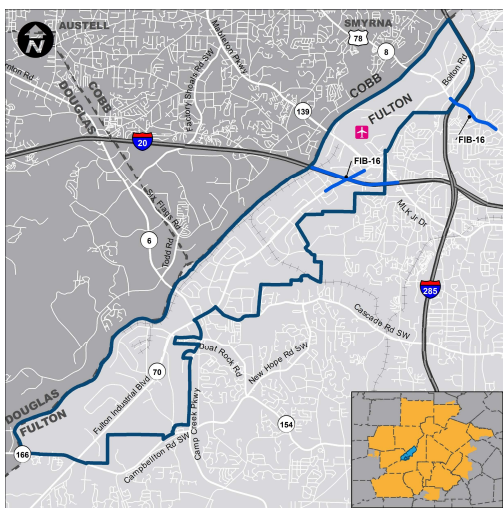
FIB-15: Smart Corridor/Intelligent Transportation Systems Connected Vehicle Infrastructure on Fulton Industrial Boulevard



Cost Estimate	\$2,255,000
Suggested Funding Source	GDOT Traffic Operations
Potential Project Champion	GDOT

- Outfit existing traffic signals along Fulton Industrial Boulevard from Shirley Way to Campbellton Road, excluding Camp Creek Parkway (11 signals total) with connected vehicle infrastructure.
- Provides capabilities for:
 - Emergency Vehicle Priority
 - Transit Signal Priority
 - Freight Signal Priority.

FIB-16: Smart Corridor/Intelligent Transportation Systems Smart Work Zones Adjacent to Major Roadway Projects

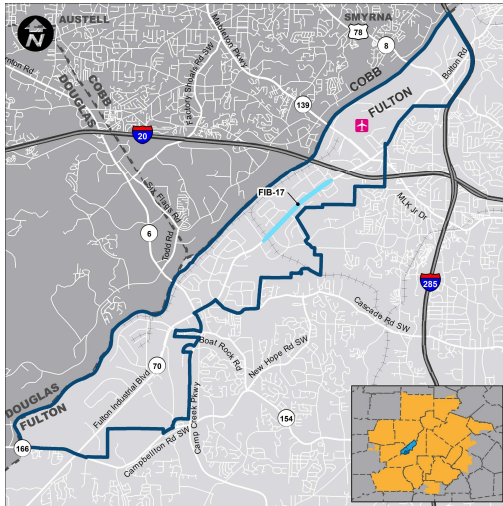


Cost Estimate	\$150,000
Suggested Funding Source	BIL SMART Grant Program
Potential Project Champion	GDOT

- Install ITS devices near project locations to connect freight vehicles in-cab. Include provisions in GDOT's Maintenance of Traffic (MOT) plans for the Donald L. Hollowell and I-20/I-285 West Interchange projects.
- Devices will be located on:
 - I-20
 - Fulton Industrial Boulevard
 - Donald L. Hollowell Parkway.

FIB-17: Pedestrian Safety/Workforce Supportive

Pedestrian Infrastructure on Fulton Industrial Boulevard Between I-20 and Selig Drive

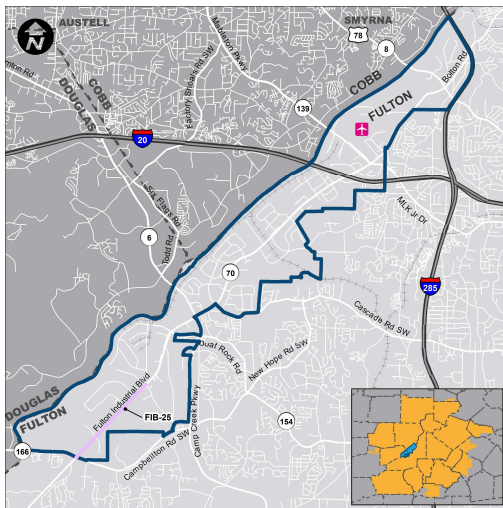


Cost Estimate	\$3,901,000
Suggested Funding Source	ARC TIP
Potential Project Champion	City of South Fulton

- Complete sidewalk network along both sides of Fulton Industrial Boulevard between I-20 and Selig Drive by installing five-foot sidewalks with a buffer from the roadway and crosswalks across all side streets, along with 2 crosswalks across Fulton Industrial Boulevard at Bakers Ferry Road.
- Total of 3.45 linear miles of sidewalks and 13 painted crosswalks.

FIB-25: Transit

Extend Marta Bus Route 73 South to Campbellton Road

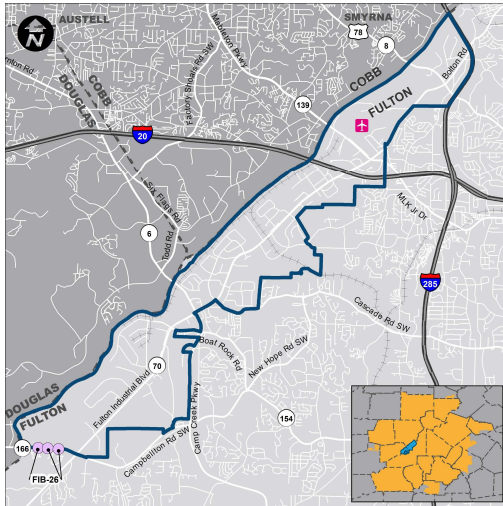


Cost Estimate	\$335,000
Suggested Funding Source	MARTA Operations and Maintenance Budget
Potential Project Champion	MARTA

- Extend MARTA Bus Route 73 south to Campbellton Road and west along Campbellton Road to Chattahoochee River.
- Could potentially include loop around Westgate Parkway.
- Add bus stops to serve:
 - Westgate Parkway
 - Fastenal
 - West Fulton Commerce Park
 - Bosch, Eagle Vista Parkway
 - Kendall Park Lane
 - Chattahoochee Logistics Center
 - Anatole Housing Development
 - Manheim
 - The Park at Riverview/Harmony Park.

FIB-26: Transit

Pedestrian Crossings for MARTA Bus Route 73 Extension

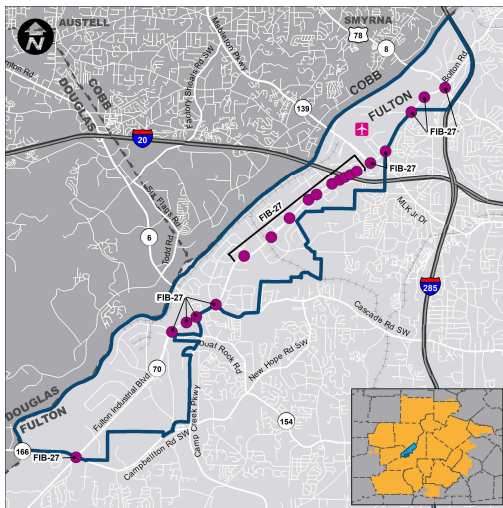


Cost Estimate	\$165,000
Suggested Funding Source	GDOT Transportation Alternatives Program (TAP) Lump Sum
Potential Project Champion	MARTA

- Install Pedestrian Hybrid Beacons at three locations to connect the proposed bus stops on Campbellton Road.

FIB-27: Intersection Improvements

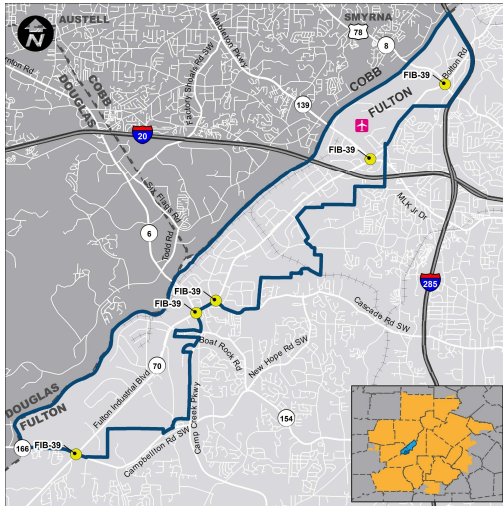
Supplemental Signal Heads on Fulton Industrial Boulevard



Cost Estimate	\$2,000,000
Suggested Funding Source	GDOT Signal Upgrades Lump Sum
Potential Project Champion	GDOT

- Install supplemental near-side signal heads to assist drivers behind large trucks at all 20 traffic signals along the Fulton Industrial Boulevard corridor between Donald L. Hollowell Parkway and Campbellton Road.

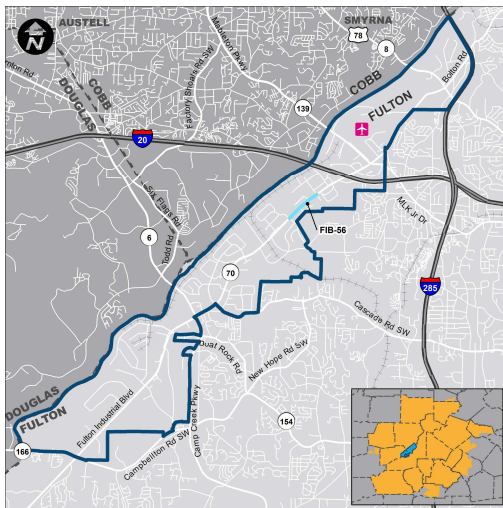
FIB-39: Economic Development/Land Use Gateway/Wayfinding Signage



Cost Estimate	\$300,000
Suggested Funding Source	SRTA GTIB
Potential Project Champion	Boulevard CID

- Install FID gateway/wayfinding signage at key intersections along the corridor, including:
 - Camp Creek Parkway
 - Campbellton Road
 - Great Southwest Parkway/Cascade Road
 - Martin Luther King Jr. Drive.

FIB-56: Pedestrian Safety/Workforce Supportive Speed Limit Reduction on Fulton Industrial Boulevard



Cost Estimate	\$1,000
Suggested Funding Source	GDOT Traffic Operations Budget
Potential Project Champion	GDOT

- Reduce speed limit to 35 mph on Fulton Industrial Boulevard from Mendel Drive/Wharton Drive to Patton Drive to reduce pedestrian fatalities.

FIB-34: Policy/Programming

Expand Electric Vehicle Charging



Source: 13WMAZ

Cost Estimate	\$0
Suggested Funding Source	-
Potential Project Champion	Boulevard CID

- Create a subcommittee including Georgia Power and CID stakeholders to identify locations for public electric vehicle charging stations.

FIB-35: Policy/Programming

Emergency Procedures for Critically Vulnerable Transportation Assets



Cost Estimate	TBD
Suggested Funding Source	CID Funds
Potential Project Champion	Boulevard CID

- Develop emergency procedures for critically vulnerable transportation assets in the FID in the case of events such as floods or terrorism.
- Establish relationships between organizations and individuals in the FID.

FIB-41: Policy/Programming

Branding to City Officials and Stakeholders



Cost Estimate	TBD
Suggested Funding Source	CID Funds
Potential Project Champion	Boulevard CID

- Host periodic tours for stakeholders and city officials showcasing a different industry or innovation each time.
- Provide handouts on key FID facts and figures.

FIB-43: Policy/Programming

Participate in Regional Off-peak Initiatives



Source: Commercial Edge

Cost Estimate	\$0
Suggested Funding Source	-
Potential Project Champion	Boulevard CID

- Participate in any regional initiatives to address off-peak freight deliveries.

FIB-44: Policy/Programming

Introduction of Amenities to Support Workforce



Source: Riverwood Properties

Cost Estimate	TBD
Suggested Funding Source	CID Funds
Potential Project Champion	Boulevard CID

- Partner with the City of South Fulton to gather demographics to support the opening of amenities in the FID. These may include restaurants, retail, dry cleaners, banks, etc.

FIB-45: Policy/Programming

Encourage the Development of Ghost Kitchens in the FID



Source: Combo Kitchen

Cost Estimate	\$0
Suggested Funding Source	-
Potential Project Champion	Boulevard CID

- Ghost Kitchens are food preparation/cooking facilities used to prepare delivery-only meals and may host kitchen space for multiple restaurant brands. This would provide quick food delivery options for employees in the FID.
- Steps to encourage development of these facilities include identification of potential locations, revised zoning to allow for food service, and partnerships with food delivery services.

FIB-46: Policy/Programming

Encourage Restaurant Events in the FID



Source: Central Atlanta Progress

Cost Estimate	TBD
Suggested Funding Source	CID Funds
Potential Project Champion	Boulevard CID

- Encourage food truck event producers to host "Food Truck Fridays" in the CID.

FIB-47: Policy/Programming

Solar Panel Showcase



Source: Radiance Solar

Cost Estimate	\$0
Suggested Funding Source	-
Potential Project Champion	Boulevard CID

- Encourage the installation of solar panels by showcasing existing case studies (e.g. Miller Zell).

FIB-51: Policy/Programming Commute Assistance Program



Source: Georgia Commute Options

Cost Estimate	TBD
Suggested Funding Source	Georgia Commute Options Funds
Potential Project Champion	Georgia Commute Options

- Partner with Georgia Commute Options to educate employers and employees about transportation options, coordinate carpools/vanpools, and coordinate micromobility.

FIB-52: Policy/Programming Carpool/Vanpool Programs

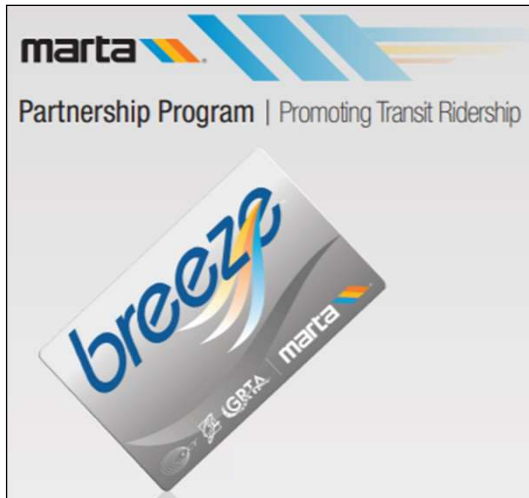


Source: Commuter Connect

Cost Estimate	TBD
Suggested Funding Source	Georgia Commute Options Funds
Potential Project Champion	Georgia Commute Options

- Supplemental measures to promote carpools and vanpools developed through Georgia Commute Options:
 - Branded preferential carpool parking, with larger employers receiving signage for parking spaces only for carpool vehicles in preferred locations.
 - Employers subsidizing vanpool rentals.

FIB-53: Policy/Programming Discounted MARTA Passes

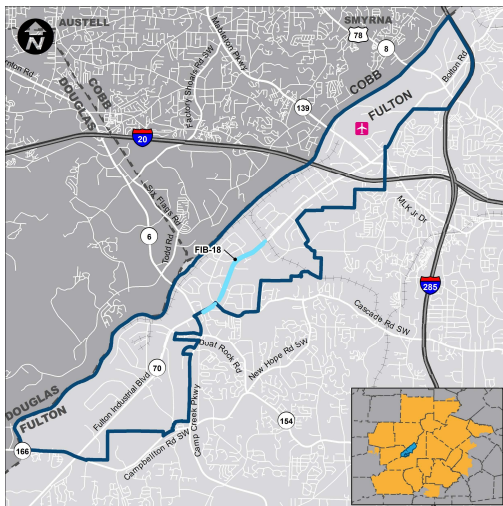


Source: MARTA

Cost Estimate	\$0
Suggested Funding Source	-
Potential Project Champion	Boulevard CID

- Encourage businesses to work with MARTA to purchase discounted MARTA passes.
- Aggregate purchases from smaller employers to increase discount.

FIB-18: Pedestrian Safety/Workforce Supportive Pedestrian Infrastructure on Fulton Industrial Boulevard Between Selig Drive and Camp Creek Parkway

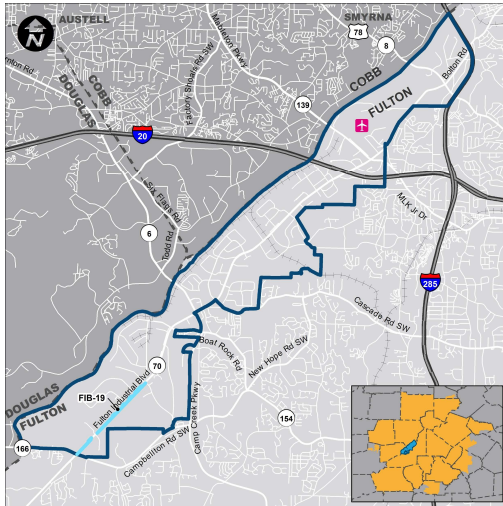


Cost Estimate	\$3,690,000
Suggested Funding Source	ARC TIP
Potential Project Champion	City of South Fulton

- Complete sidewalk network along both sides of Fulton Industrial Boulevard between Selig Drive and Camp Creek Parkway by installing five-foot sidewalks with a buffer from the roadway and crosswalks across all side streets.
- Total of 3.05 linear miles of sidewalks and 10 painted crosswalks.
- Includes conversion of shoulder of bridge over Utoy Creek to a five-foot sidewalk with curb and fence.

FIB-19: Pedestrian Safety/Workforce Supportive

Pedestrian Infrastructure on Fulton Industrial Boulevard Between Camp Creek Parkway and Tradewater Parkway/Riverside Drive

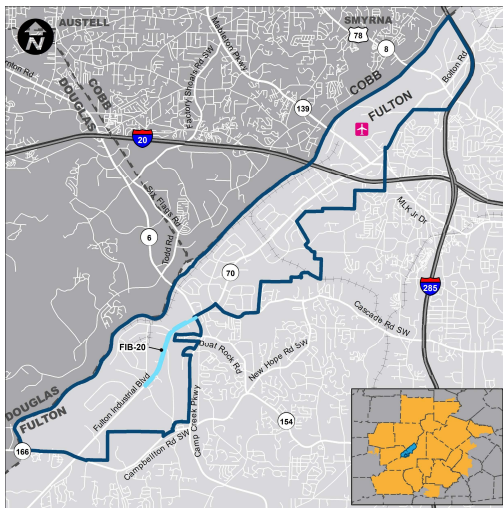


Cost Estimate	\$3,200,000
Suggested Funding Source	ARC TIP
Potential Project Champion	City of South Fulton

- Complete sidewalk network along both sides of Fulton Industrial Boulevard between Camp Creek Parkway and Tradewater Parkway/Riverside Drive by installing five-foot sidewalks with a buffer from the roadway and crosswalks across all side streets.
- Install a Pedestrian Hybrid Beacon across Fulton Industrial Boulevard at Westlake Boulevard.
- Total of 2.85 linear miles of sidewalks and 6 painted crosswalks.

FIB-20: Pedestrian Safety/Workforce Supportive

Pedestrian Infrastructure on Fulton Industrial Boulevard Between Tradewater Parkway/Riverside Drive and Campbellton Road

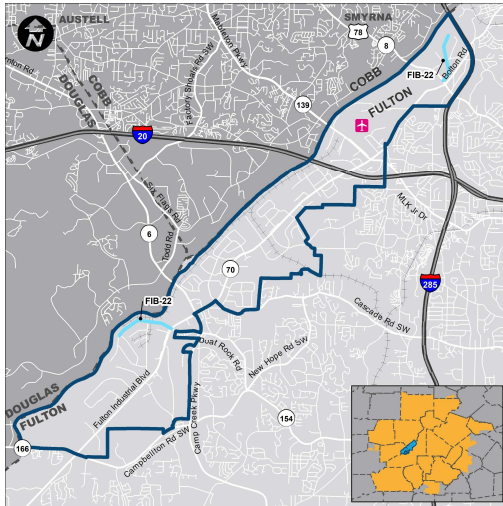


Cost Estimate	\$2,291,000
Suggested Funding Source	ARC TIP
Potential Project Champion	City of South Fulton

- Complete sidewalk network along both sides of Fulton Industrial Boulevard between Tradewater Parkway/Riverside Drive and Campbellton Road by installing five-foot sidewalks with a buffer from the roadway and crosswalks across all side streets.
- Total of 2.05 linear miles of sidewalks and 2 painted crosswalks.

FIB-22: Pedestrian Safety/Workforce Supportive

Pedestrian Infrastructure Connections to Employment Hubs Off of Fulton Industrial Boulevard

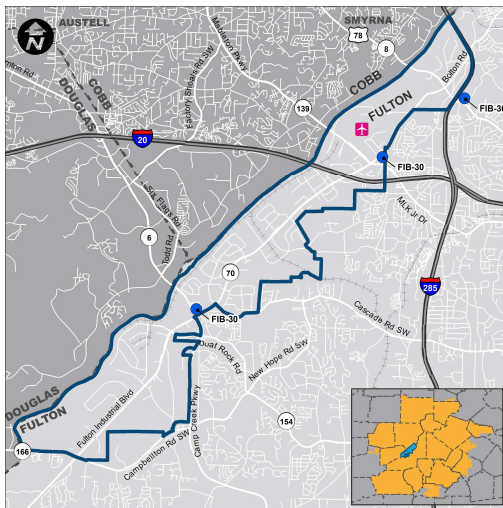


Cost Estimate	\$2,684,000
Suggested Funding Source	ARC TIP
Potential Project Champion	City of South Fulton

- Installation of a five-foot sidewalk adjacent to the east side of Atlanta Industrial Parkway and to the south side of Boat Rock Boulevard.
- Total of 1.95 miles and 4 painted crosswalk.

FIB-30: Smart Corridor/Intelligent Transportation Systems

Truck Parking Wayfinding Signage

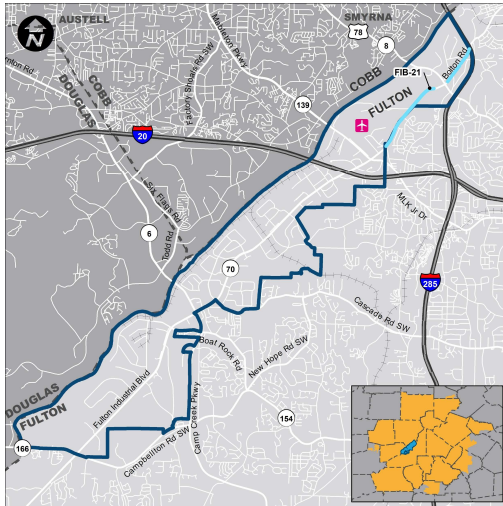


Cost Estimate	\$420,000
Suggested Funding Source	GDOT Freight Operations Lump Sum
Potential Project Champion	GDOT

- Install truck parking wayfinding signage to guide truck drivers to lots/staging areas such as Petro Stopping Center or QuickTrip Truck Parking.
- Work with lot owners to install technology to be able to show parking availability on signage/apps.

FIB-21: Pedestrian Safety/Workforce Supportive

Pedestrian Infrastructure on Fulton Industrial Boulevard Between I-285 and I-20

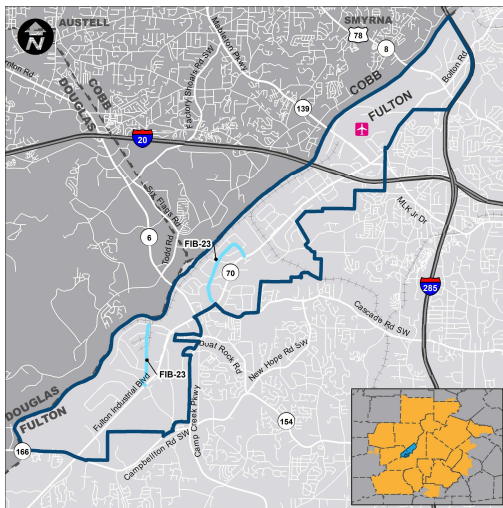


Cost Estimate	\$2,325,000
Suggested Funding Source	ARC TIP
Potential Project Champion	City of Atlanta

- Complete sidewalk network along both sides of Fulton Industrial Boulevard between I-285 and I-20 by installing five-foot sidewalks with a buffer from the roadway and crosswalks across all side streets.
- Total of 2.08 linear miles of sidewalks and 2 painted crosswalks.

FIB-23: Pedestrian Safety/Workforce Supportive

Pedestrian Infrastructure Connections to Fulton Industrial Boulevard

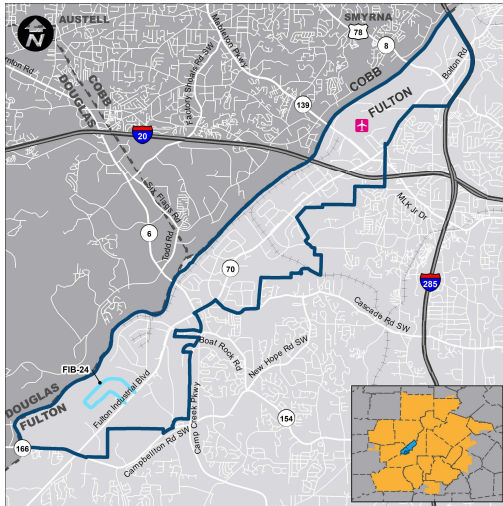


Cost Estimate	\$2,085,000
Suggested Funding Source	ARC TIP
Potential Project Champion	City of South Fulton

- **FIB-8.4:** Installation of a five-foot sidewalk adjacent to the west side of Lagrange Boulevard and adjacent to the south/east side (inside) of Great Southwest Parkway.
- Total of 2.69 miles and 8 painted crosswalks.

FIB-24: Pedestrian Safety/Workforce Supportive

Pedestrian Infrastructure Connections to Fulton Industrial Boulevard

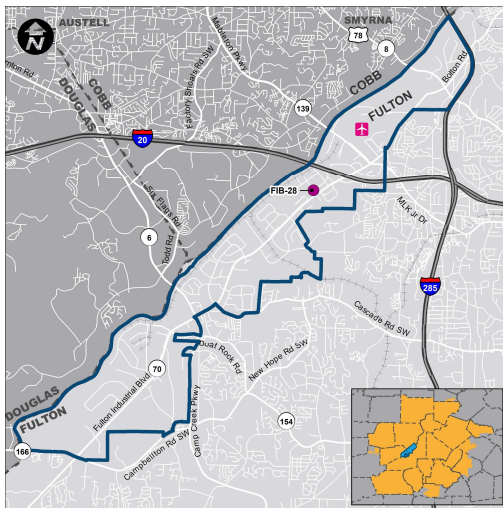


Cost Estimate	\$1,669,000
Suggested Funding Source	ARC TIP
Potential Project Champion	City of South Fulton

- Installation of a five-foot sidewalk adjacent to the south/east side (inside) of Westgate Parkway.
 - Total of 2.16 miles.

FIB-28: Intersection Improvements

Increase Intersection Turning Radii at Patton Drive and Mills Place

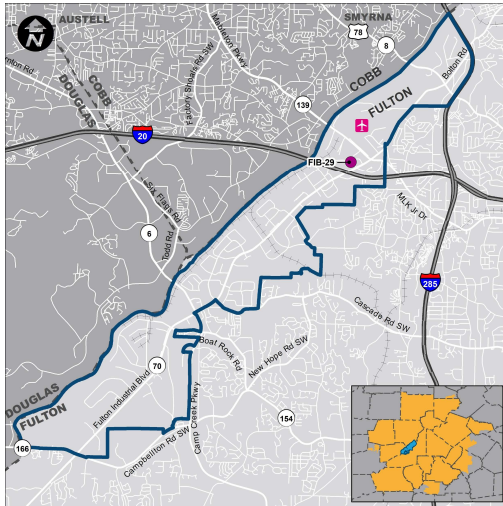


Cost Estimate	\$750,000
Suggested Funding Source	Local Funds
Potential Project Champion	City of South Fulton

- Increase turning radii at north and east corners.

FIB-29: Intersection Improvements

Increase Intersection Turning Radius at Wendell Drive and Interchange Drive

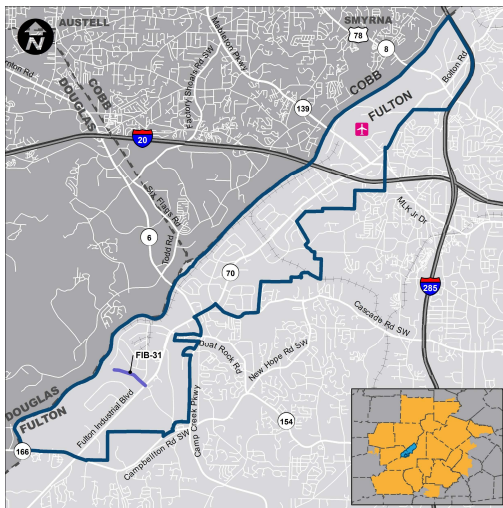


Cost Estimate	\$450,000
Suggested Funding Source	Local Funds
Potential Project Champion	City of South Fulton

- Increase turning radius at east corner.

FIB-31: Maintenance

Tradewater Parkway Resurfacing

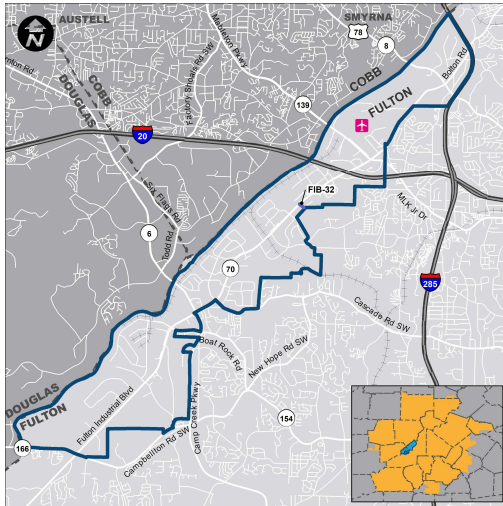


Cost Estimate	\$294,000
Suggested Funding Source	GDOT LMIG
Potential Project Champion	City of South Fulton

- Full-depth reclamation of the entirety of Tradewater Parkway.

FIB-32: Maintenance

Robinson Drive Resurfacing

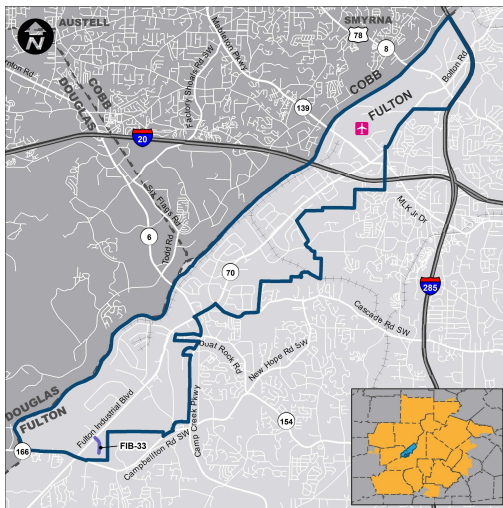


Cost Estimate	\$78,000
Suggested Funding Source	GDOT LMIG
Potential Project Champion	City of South Fulton

- Resurface the entirety of Robinson Drive.

FIB-33: Maintenance

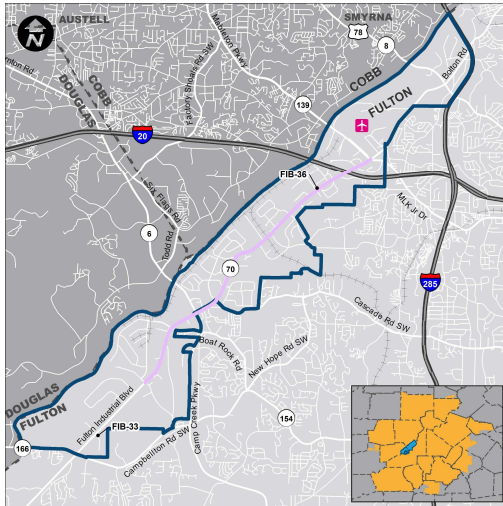
Kendall Park Lane Resurfacing



Cost Estimate	\$234,000
Suggested Funding Source	GDOT LMIG
Potential Project Champion	City of South Fulton

- Resurface the entirety of Kendall Park Lane.

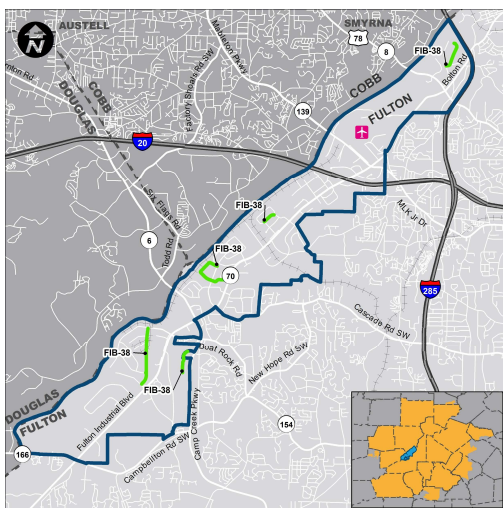
FIB-36: Transit Bus Stop Upgrades



Cost Estimate	\$1,232,000
Suggested Funding Source	MARTA Operations and Maintenance Budget
Potential Project Champion	MARTA

- Upgrade bus stops along Route 73 to include shelters, benches, signage, lighting, and trash receptacles.
- Connect bus stops to sidewalk network.
- 74 bus stops need some type of upgrade:
 - 59 need shelters
 - 54 need benches
 - 59 need lighting
 - 7 need signage
 - 52 need trash receptacles.

FIB-38: Capacity/Widening Truck Staging Lanes on Shoulder

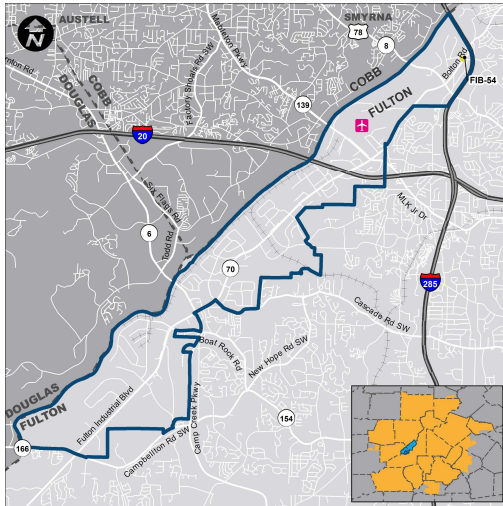


Cost Estimate	TBD
Suggested Funding Source	Local Funds
Potential Project Champion	City of South Fulton

- Restripe roadways with existing wide lanes to incorporate a truck staging lane on one side of the roadway. Striping will provide adequate distance from driveways to eliminate any sight distance issues.
- Example locations include Atlanta Industrial Drive, Wharton Drive, Bucknell Drive, and Westlake Parkway.
- One lane on both sides of Lagrange Boulevard can be repurposed as a truck staging lane.

FIB-54: Access Management

Connect Atlanta Industrial Way to Bolton Road

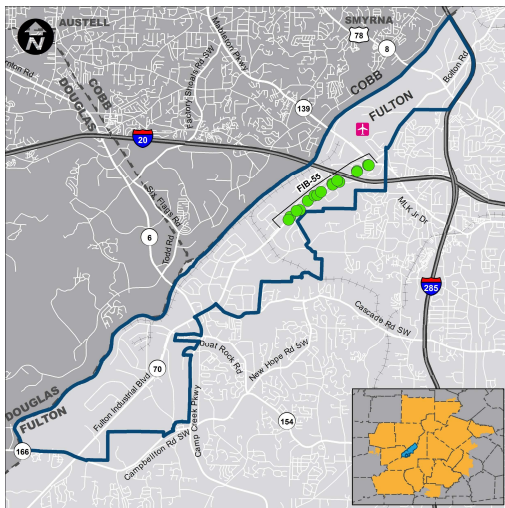


Cost Estimate	\$546,000
Suggested Funding Source	SRTA GTIB
Potential Project Champion	City of Atlanta

- Create a new connection to the Atlanta Industrial Park area by extending Atlanta Industrial Way to Bolton Road at the intersection with Northwest Drive.

FIB-55: Capacity/Widening

Bus Pull-Out Lanes on Fulton Industrial Boulevard

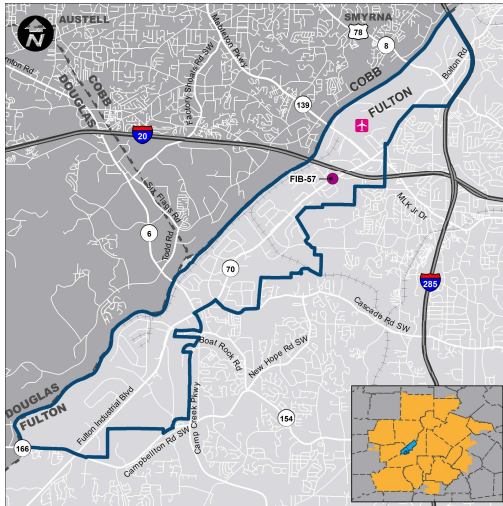


Cost Estimate	\$1,725,000
Suggested Funding Source	ARC TIP
Potential Project Champion	GDOT/MARTA

- Install bus pull-out lanes for MARTA Route 73 where shoulders aren't present on Fulton Industrial Boulevard.

FIB-57: Intersection Improvements

Intersection Realignment at Fulton Industrial Boulevard and Fulton Industrial Circle/Commerce Drive

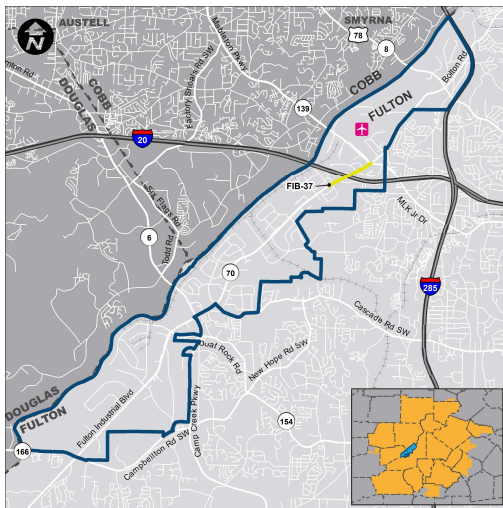


Cost Estimate	\$1,580,000
Suggested Funding Source	GDOT Freight Operations Lump Sum
Potential Project Champion	GDOT

- Realign Fulton Industrial Circle and Commerce Drive to meet at a single signalized intersection.

FIB-37: Policy/Programming

Driveway Consolidation Along Fulton Industrial Boulevard

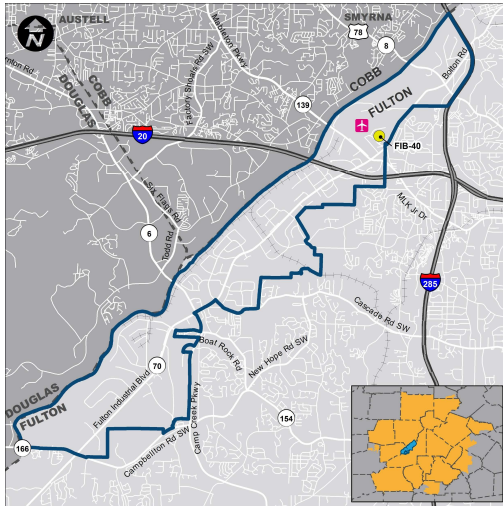


Cost Estimate	TBD
Suggested Funding Source	Developer or inclusion in nearby project cost
Potential Project Champion	Developer

- Include in the regulations for future redevelopments the consolidation of driveways along Fulton Industrial Boulevard to meet the standards in GDOT's Regulations for Driveway and Encroachment Control document, especially around the I-20 interchange.

FIB-40: Policy/Programming

Create a Sense of Place Around the Fulton County Airport



Cost Estimate	TBD
Suggested Funding Source	ARC LCI
Potential Project Champion	Boulevard CID

- Apply for an LCI grant to study the creation of a "main street" for the area around the area.
 - Develop a mix of land uses.
 - Extend MARTA service into area.
 - Develop multi-use trails and greenspace around Chattahoochee River.

FIB-42: Policy/Programming

Identify Potential Locations for Truck Parking Facilities



Source: Transport Topics

Cost Estimate	TBD
Suggested Funding Source	CID Funds
Potential Project Champion	Boulevard CID

- Identify vacant parcels or under-utilized properties that could be converted to a truck parking facility, including temporary parking facilities while lot is for sale.

FIB-48: Policy/Programming

Planning Considerations for Chattahoochee River Greenway, Proctor Creek Trail Extension, and Pedestrian Connections



Source: The Chattahoochee Riverlands Greenway Study

Cost Estimate	TBD
Suggested Funding Source	CID Funds
Potential Project Champion	Boulevard CID

- Protect/bank land that will be used for the Chattahoochee River Greenway, the Proctor Creek Trail extension, and pedestrian connections to these greenways at key locations, including along Campbellton Road, Camp Creek Parkway, Martin Luther King Jr. Drive, and Donald L. Hollowell Parkway.

FIB-49: Policy/Programming

Microtransit for Last-mile Connections from Bus Stops



Source: Rasko Ristic

Cost Estimate	TBD
Suggested Funding Source	CID Funds
Potential Project Champion	Boulevard CID

- Explore feasibility of a microtransit program using either vanpools, partnerships with Uber/Lyft, small electric vehicles such as eTuks, or shuttles, to help employees with first/last mile connections to their workplaces.
- Potential locations include the Westpark Industrial area, the Atlanta Gateway Park area, or the Boat Rock area.

FIB-50: Policy/Programming

Micromobility for Last-mile Connections From Bus Stops



Source: Town Center CID

Cost Estimate	TBD
Suggested Funding Source	CID Funds
Potential Project Champion	Boulevard CID

- Implement an electric bike share test project to connect employees from bus stops to their work location.
- Potential locations include the Westpark Industrial area, the Atlanta Gateway Park area, or the Boat Rock area.



FREIGHT CLUSTER PLAN

Appendix C: Project Scoring Matrix

	Project Category	Criteria	Metric	Point Values
Quantitative Metrics	Smart Corridor/ITS Technology	Truck volumes (magnitude)	400+ INRIX Records per segment	4
			100-400 INRIX Records per segment	2
			< 100 INRIX Records per segment	0
		Vehicle excess hours of travel	8+ hours per segment	4
			2-8 hours per segment	2
			< 2 hours per segment	0
		Vehicle hours of unreliability per mile	20 + hours per segment	4
			5-20 hours per segment	2
			< 5 hours per segment	0
	Access Management	Undesignated Truck Parking	Safety issues	4
			No safety issues	2
	Maintenance	Pavement Condition (Segments Include Adjacent Side Streets)	Very Poor - Poor PSR rating	4
			Satisfactory - Fair PSR rating	2
			Good PSR rating	0
	Intersection Improvements	Curb Condition	Cracked curb/rutting	2
	Safety	Vehicle Crashes	Fatal	4
			Injury	2
			No injury	0
		Bike/Ped Crashes	Bicycle/pedestrian-involved crashes	2
		Crash rates above statewide average	>100%	6
			51% - 100%	4
			< 51%	2
	Transit	Bus stop infrastructure	No shelter, no lighting	6
			No shelter, lighting present	4
			Shelter present, no lighting	2
			Shelter and lighting present	0
	Access to Jobs	Pedestrian infrastructure (w/in square mile of intersection; total jobs per segment region divided by area in square miles)	Sidewalks absent, >1,500 Jobs per mile	6
			Sidewalks absent, 500-1500 Jobs per mile	4
			Sidewalks absent, 0-500 Jobs per mile	2
			Sidewalks present	0
	Intersection Improvements	2031 LOS	E, F AM and PM peak	10
			E, F only one peak	8
			D	5
			C+	0
Qualitative Metrics	Public Input	Stakeholder support during meeting or comment period		4
		Controversial project or location		-4
	Economic Development/Land Use	Located at site of planned/in progress development or prepares for future operations		8
		Located at point of entry to District or enhances physical attractiveness		8
		Makes the District more appealing for future businesses to establish warehouses/offices here		8

FULTON COUNTY TRAFFIC STUDY

Fulton Industrial Boulevard (SR 70) Freight Cluster Plan

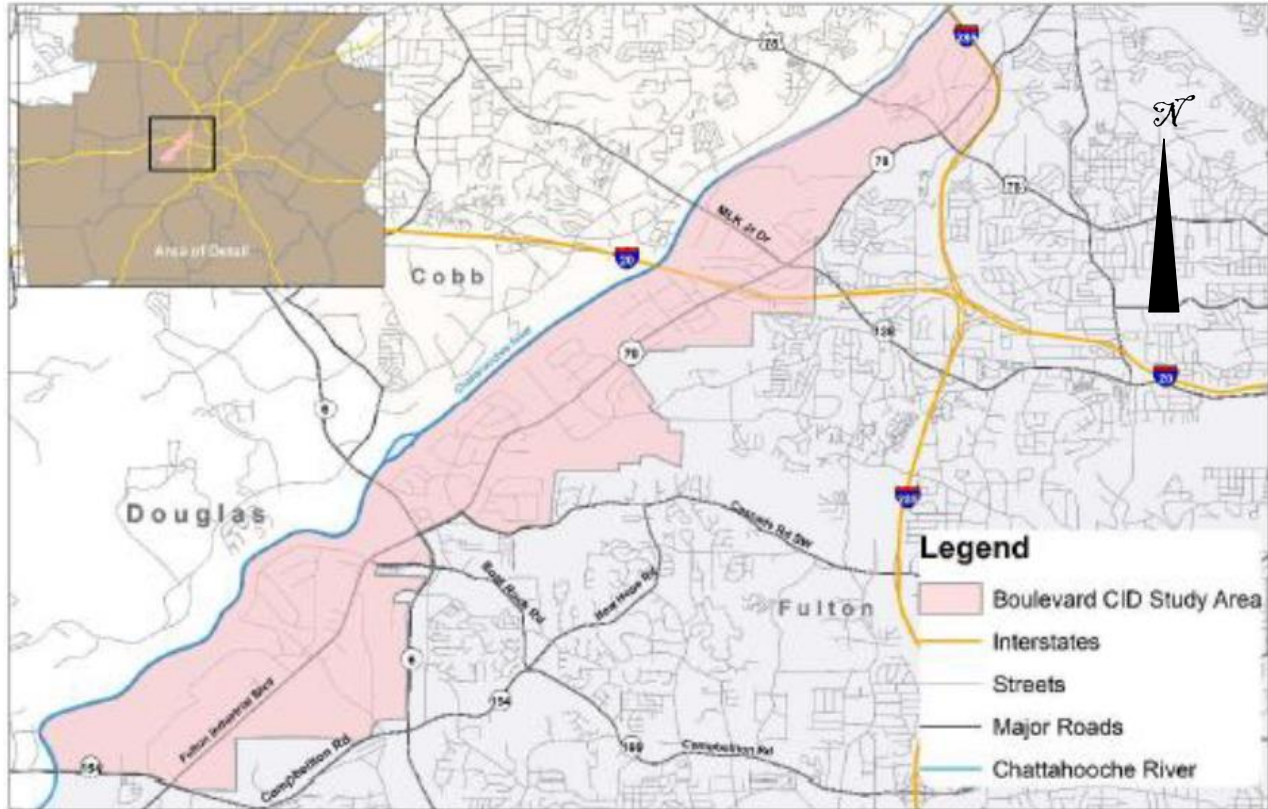


Figure 1: Study Area

Report prepared by:	David A. Fairlie P.E.
Title	Traffic Engineer
Address	ATLAS Technical Consultants 2450 Commerce Avenue, Suite 100, Duluth, Georgia 30096
Phone / Fax	(770) 263-5945 / (770) 263-5954
E-Mail Address	davidfairlie@oneatlas.com
Report reviewed by:	Todd Long, P.E., PTOE Chief Operating Officer

Report Date: September 15, 2021

Reason for Investigation

The following document is to report the findings of the Traffic Study requested by WSP USA, Inc. As described in Task Order No.1 between WSP and ATLAS Technical Consultants on November 1, 2020.

Location

The study area is located within unincorporated Fulton County, the City of South Fulton, and the City of Atlanta. The study area was recently changed from unincorporated to municipal property with the City of Atlanta capturing the area north of I-20 and the City of South Fulton capturing the area south of I-20. This transition is on-going at the time of this study. The study area includes property on both sides of Fulton Industrial Boulevard (SR 70) from Campbellton Road (SR 166) in the south to I-285 in the north. The western Border of the study area is made up of the Chattahoochee River (See Figure 1)

Study Area Description

The section of Fulton Industrial Boulevard (SR 70) under study is a 9.85 mile four-lane median-divided minor arterial, that runs SW-NE, from Campbellton Road (SR 166) to Donald Lee Hollowell Parkway (US-78) at its interchange with I-285. Fulton Industrial Boulevard has varying shoulder widths along this corridor, ranging from 2 feet to 10 feet at various sections. Sidewalks are also intermittent along the corridor. Sidewalks, however, are present on most of the north end of the corridor.

Existing Traffic Volumes:

Existing average daily traffic (ADT) volumes and turning movement counts (TMCs) were collected at several locations on Fulton Industrial Boulevard. Due to the high number of locations that needed to be studied, several sources were used to obtain this data. ATLAS conducted manual TMCs for 12 intersections along the corridor as well as three 48-hour pneumatic tube counts at strategic locations, in addition to the five GDOT count stations with historic traffic data. Previous projects and studies were also reviewed in order to obtain counts for 8 other locations, and GDOT's Automatic Traffic Signal Performance Measures (ATSPM) database was also consulted to obtain counts at 9 intersections. Table 1 lists the locations, type of count, and the source of the data.

Table 1: Analyzed Intersections and Source of Turning Movement Counts (TMCs).

Location	Count Type	Source
Fulton Industrial @ SR 166/Cambellton Rd	TMC	2021 Manual Count
Fulton Industrial @ Westgate Pkwy (2 intersections)	TMC	Previous Study
Fulton Industrial Boulevard, South of Riverside Drive	48-hour	GDOT Station 121-0260
Fulton Industrial @ Tradewater Pkwy/Riverside Dr.	TMC	2021 Manual Count
Fulton Industrial Boulevard, North of Riverside Drive	48-Hour	2021 Pneumatic Tube
Fulton Industrial @ Boat Rock Rd.	TMC	ATSPM
Fulton Industrial @ Lakeview Ct.	TMC	2021 Manual Count
Fulton Industrial @ Camp Creek Pkwy	TMC	ATSPM
Fulton Industrial @ Bakers Ferry Road	TMC	Previous Study
Fulton Industrial Boulevard, north of Bakers Ferry Rd.	48-hour	GDOT Station 121-5262
Fulton Industrial @ Great SW Pkwy/Cascade Rd.	TMC	2021 Manual Count
Fulton Industrial Boulevard, north of Cascade Road	48-Hour	2021 Pneumatic Tube

Location	Count Type	Source
Fulton Industrial @ Villanova / Westpark Pl	TMC	2021 Manual Count
Fulton Industrial @ Bucknell	TMC	Previous Study
Fulton Industrial @ Great SW Pkwy/Great SW Pkwy	TMC	ATSPM
Fulton Industrial @ Bakers Ferry Rd	TMC	2021 Manual Count
Fulton Industrial @ Wharton Dr/Mendel Dr.	TMC	2021 Manual Count
Fulton Industrial @ Marvin Miller Dr	TMC	2021 Manual Count
Fulton Industrial Boulevard south of Patton Drive	48-hour	GDOT Station 121-5266
Fulton Industrial @ Patton Drive	TMC	ATSPM
Fulton Industrial @ Commerce Circle (signal)	TMC	2021 Manual Count
Fulton Industrial @ Fulton Industrial Circle	TMC	2021 Manual Count
Fulton Industrial @ Shirley Dr	TMC	2021 Manual Count
Fulton Industrial @ I-20 SB ramps	TMC	Previous Study
Fulton Industrial @ I-20 NB ramps	TMC	Previous Study
Fulton Industrial @ Wendell Dr	TMC	2021 Manual Count
Fulton Industrial Boulevard, north of Wendell Dr.	48-Hour	GDOT Station 121-5268
Fulton Industrial Boulevard, north of Wendell Dr.	48-Hour	2021 Pneumatic Tube
Fulton Industrial @ MLK Jr. Dr.	TMC	ATSPM
Fulton Industrial Boulevard, south of Sandy Creek Rd.	48-hour	GDOT Station 121-5270
Fulton Industrial @ Sandy Creek Rd.	TMC	ATSPM
Fulton Industrial @ UPS north driveway	TMC	ATSPM
Donald Lee Hollowell Pkwy @ Atlanta Ind. Pkwy.	TMC	ATSPM
Fulton Industrial Blvd @ Donald Lee Hollowell (SR 8)	TMC	ATSPM
SR 8 between Fulton Industrial Blvd and Bolton Rd.	48-Hour	GDOT Station 121-5069
SR 8 @ Bolton Rd	TMC	Previous Study
SR 8 @ I-285 SB Ramps	TMC	Previous Study
SR 8 @ I-285 NB Ramps	TMC	Previous Study

Vehicle classification, i.e. cars, buses, single unit trucks, heavy trucks, etc. were also collected as part of the turning movement counts, in order to determine truck percentages for each movement at each of the intersections studied. These individual turning movement truck percentages were carefully incorporated into the capacity analysis of each intersection studied. The raw TMCs that Atlas obtained from its vendor (All Traffic Data) can be found in the Appendix.

The three 48-hour counts that were obtained from its vendor included vehicle classification and were taken in 15-minute intervals, which allowed to obtain peak hour factors. This data was used mostly for the multilane roadway segment analysis of the corridor, also known as roadway capacity analysis. GDOT count station 121-5270 was used for the capacity analysis of one of the four roadway segments. The four roadway segments analyzed will be further discussed in the “Corridor Analysis” section of this report.

The data obtained from GDOT count stations was used mostly to identify the trend of traffic growth and forecast traffic volumes for the future year of 2031.

Corridor Analysis of existing (2021) conditions:

The studied segment of Fulton Industrial Boulevard, was divided into four sections and each was analyzed for the 2021 peak hour conditions (whether they were AM or PM) using the FHWA's Highway Capacity Manual, 2010's methodology for multi-lane roadways. This analysis takes into consideration the number of access points (side-streets and driveways) along each corridor section, the peak hour volume and truck percentages, which were obtained from the 48-hour counts that were collected by ATLAS and by GDOT's mobile count stations, the terrain (level, rolling, mountain, etc), peak hour factor, among other variables.

Volumes for the first three segments were obtained from the 48-hour counts that were performed on the week of May 5th, 2021. These counts included vehicle classification (i.e. truck percentages) as well as peak hour factors. Counts for the fourth roadway segment on Fulton Industrial Boulevard, from I-20 to Donald Lee Holloway, were obtained from GDOT's Traffic Analysis and Data Application (TADA) website. These counts were collected on February 13, 2019 and did not include vehicle classification. A vehicle classification had been performed however, on June 13, 2017, so, the truck percentages were obtained from that count. Peak hour factors were absent from both the 2019 and 2017 counts, so the standard 0.92 peak hour factor was used for that segment, which coincides with the lowest peak hour factor registered along the whole corridor.

The methodology calculates the density of traffic flow along the corridor segment in passenger cars per mile per lane (pc/mi/ln) and assigns a level of service (LOS) value from A to F accordingly, where a LOS A signifies free-flow conditions while a LOS F indicates high levels of congestion. The results of the analysis are shown in Table 2. A full report of the analysis is included in the Appendix.

Table 2: 2021 Multi-Lane Analysis Input Data and LOS – Fulton Industrial Boulevard

		Peak hour volume	Segment length (mi)	Access Points per Mile	Peak hour factor	Truck Percentage	LOS (Density in pc/mi/ln)
FIB from Campbellton Road to Camp Creek Pkwy.	NB	960	3.48	4	0.93	10%	A (10.8)
	SB	1255		5	0.95	10%	B (13.8)
FIB from Camp Creek Pkwy to Wharton Drive SW	NB	1597	2.55	7	0.92	8%	C (21.4)
	SB	1359		7	0.98	9%	B (16.1)
FIB from Wharton Drive SW to I-20	NB	1807	1.32	17	0.93	9%	B (16.1)
	SB	1547		16	0.95	10%	B (13.7)
FIB from I-20 to Donald Lee Hollowell Pkwy.	NB	1121	2.48	11	0.92	21%	B (15.0)
	SB	1287		13	0.92	20%	D (26.4)

The results show that all segments analyzed are currently operating at acceptable levels of service. The worst performing segment is the southbound section of Fulton Industrial Boulevard, between Donald Lee Hollowell Parkway and Interstate I-20, which operates at a LOS D with a density of 26.4 pc/mi/ln. This segment also has the highest truck percentage of the four segments analyzed, which contributes to the higher vehicle density and the higher level of service.

Intersection analysis – Existing Conditions:

Throughout the corridor, 28 intersections were analyzed under existing traffic conditions. This analysis was done to identify, and verify any issues that currently exist. The results of the analysis

are shown in Table 3:

Table 3: LOS and Delay Results Summary for Existing Conditions (2021)

Location	Control Type	AM		PM	
		LOS	Delay (s)	LOS	Delay (s)
Fulton Industrial @ SR 166/Campbellton Rd	Signal	B	17.8	C	28.5
Fulton Industrial @ Westgate Pkwy (S)	Stop	E	38.5	F	526.2
Fulton Industrial @ Westgate Pkwy (N)	Stop	F	374.4	F	810.6
Fulton Industrial @ Tradewater Pkwy/Riverside Dr.	Stop	F	175.3	F	638.2
Fulton Industrial @ Boat Rock Rd.	Signal	C	20.3	C	26.2
Fulton Industrial @ Lakeview Ct.	Signal	A	7.8	A	7.0
Fulton Industrial @ Camp Creek Pkwy	Signal	C	26.6	C	26.3
Fulton Industrial @ Great SW Pkwy/Cascade Rd.	Signal	C	30.6	D	50.3
Fulton Industrial @ Villanova / Westpark Pl	Stop	F	342.7	F	3049.1
Fulton Industrial @ Great SW Pkwy/Great SW Pkwy	Signal	B	15.4	B	12.7
Fulton Industrial @ Bakers Ferry Rd	Signal	B	11.00	B	11.5
Fulton Industrial @ Wharton Dr/Mendel Dr.	Signal	B	10.0	B	14.9
Fulton Industrial @ Marvin Miller Dr	Signal	A	5.2	A	7.3
Fulton Industrial @ Patton Drive	Signal	E	61.3	C	33.2
Fulton Industrial @ Commerce Circle (signal)	Signal	A	6.9	B	16.0
Fulton Industrial @ Fulton Industrial Circle	Stop	A	8.9	A	8.8
Fulton Industrial @ Shirley Dr	Signal	A	4.0	A	4.9
Fulton Industrial @ I-20 SB ramps	Signal	C	31.1	B	18.1
Fulton Industrial @ I-20 NB ramps	Signal	C	21.4	C	20.1
Fulton Industrial @ Wendell Dr	Signal	A	5.0	A	8.2
Fulton Industrial @ MLK Jr. Dr.	Signal	D	40.6	D	49.8
Fulton Industrial @ Aviation Circle/Old Gordon Rd.	Signal	B	12.3	C	22.4
Fulton Industrial @ UPS north driveway	Signal	B	11.7	B	10.5
Donald Lee Hollowell Pkwy @ Atlanta Ind. Pkwy.	Signal	A	5.0	A	5.9
Fulton Industrial Blvd @ Donald Lee Hollowell (SR 8)	Signal	C	24.0	C	23.8
SR 8 @ Bolton Rd	Signal	A	6.8	B	10.6
SR 8 @ I-285 SB Ramps	Signal	B	19.9	B	17.0
SR 8 @ I-285 NB Ramps	Signal	B	16.4	B	19.7

As can be seen from the reported results, the majority of unsignalized intersections that were analyzed presented failing levels of service. In the next paragraphs we will include an intersection-by-intersection analysis of issues found:

Fulton Industrial Boulevard at SR 166/Campbellton Rd

The results of the analysis show that this intersection does not have considerable operational issues during the AM peak hour. However, it was observed that during the PM peak hour the westbound through movement (on Campbellton Road) presents an average delay of 45.5 seconds (LOS D), which generates a 95th percentile queue of 490 feet. This queue may cause difficulty for vehicles exiting the newly built BP gas station on the south-east corner of this intersection, attempting to turn left onto Campbellton Road.

Fulton Industrial Boulevard at Westgate Parkway (South)

The intersection of FIB at Westgate Parkway (South) is currently STOP-sign controlled on Westgate Parkway. During the AM and PM peak hours 59 and 179 vehicles were counted entering FIB from Westgate Parkway. Motorists on Westgate Parkway attempting to turn left onto FIB in the PM experience delays in excess of eight minutes, according to the analysis. This delay is due in part to the number of vehicles attempting to turn left (79) but mostly the southbound volume on FIB (1246). This intersection may be a candidate for signalization.

Fulton Industrial Boulevard at Westgate Parkway (North)

The intersection of FIB at Westgate Parkway (North) is currently STOP-sign controlled on Westgate Parkway. During the AM and PM peak hours 79 and 71 vehicles turn left out of Westgate Parkway onto Fulton Industrial Boulevard, which has a northbound volume of 1450 vehicles in the AM and 1350 vehicles in the southbound direction during the PM. This causes excessive delays for vehicles exiting Westgate Parkway during both peak hours. This intersection may be a candidate for signalization. Since Westgate Parkway (North) and Westgate Parkway (South) connect with each other in a sort of loop, it is likely that only one of the two intersections would need to be signalized. Vehicles on either road would then be drawn toward the signalized intersection which would reduce volumes, and therefore delays at the other location.

Fulton Industrial Boulevard at Tradewater Parkway/Riverside Drive.

The intersection of FIB at Tradewater Parkway/Riverside Drive is STOP-Controlled on both side-streets and has enough traffic volume on both side-streets to warrant a traffic control signal. The analysis of the existing condition shows that the intersection performs at a LOS F during both the AM and PM but performs worse in the PM. This intersection is a candidate for signalization.

Fulton Industrial Boulevard at Villanova Drive / Westpark Place

This intersection is currently STOP-sign controlled and has a LOS F for both side-street approaches in the AM and PM. Volumes on the side streets seem to indicate that a traffic control signal may be warranted for this location.

Fulton Industrial Boulevard at Patton Drive

The intersection of FIB at Patton Drive is currently signalized and shows congestion during the AM peak hour. On FIB in the northbound direction, with 95th percentile queues of over 800 feet and delays of 132.6 seconds for left turners. In the southbound direction, through queues can exceed 500 feet, while left turns experience an average delay of 83.4 seconds. In the westbound direction, 95th percentile queues can reach 780 feet and average delays of 117 seconds. These delays and queues are mostly due to the high volumes on FIB (2432 vehicles in the NB direction).

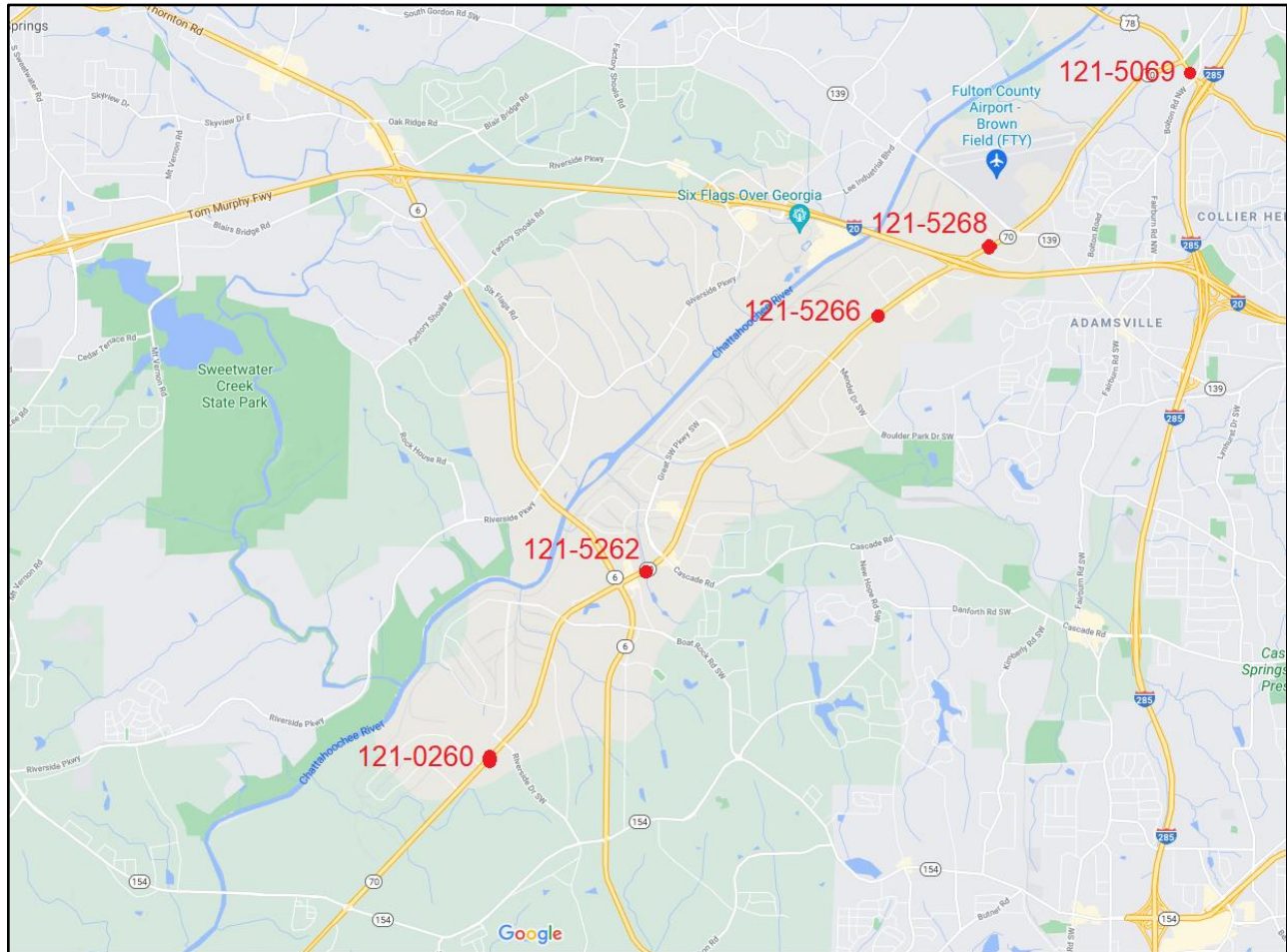
Fulton Industrial Boulevard at MLK Jr. Drive.

Although the intersection of FIB at MLK Jr. Drive has LOS “D” for both AM and PM peak hour, delays of over 60 seconds can be observed in certain turning movements. This is the case for the MLK southbound right-turn movement, which has a LOS E and 95th percentile queue of 765 feet during the AM peak hour.

Traffic Volume Forecasting:

The Georgia Department of Transportation's Traffic Analysis and Data Application (TADA) website presents data collected from the Georgia Traffic Monitoring Program located on the public roads in Georgia. The data recorded by five GDOT traffic count stations on Fulton Industrial Boulevard (SR 70) was collected and used to calculate the annual growth rate for traffic volumes along the corridor. The location of each count station is shown on a map in Figure 2. The calculated growth rate then would be used to predict the Average Annual Daily Traffic (AADT) for the year 2031 for all intersections and roadway segments along the corridor and within the study area.

Figure 2: GDOT Count Stations Used for Traffic Forecasting



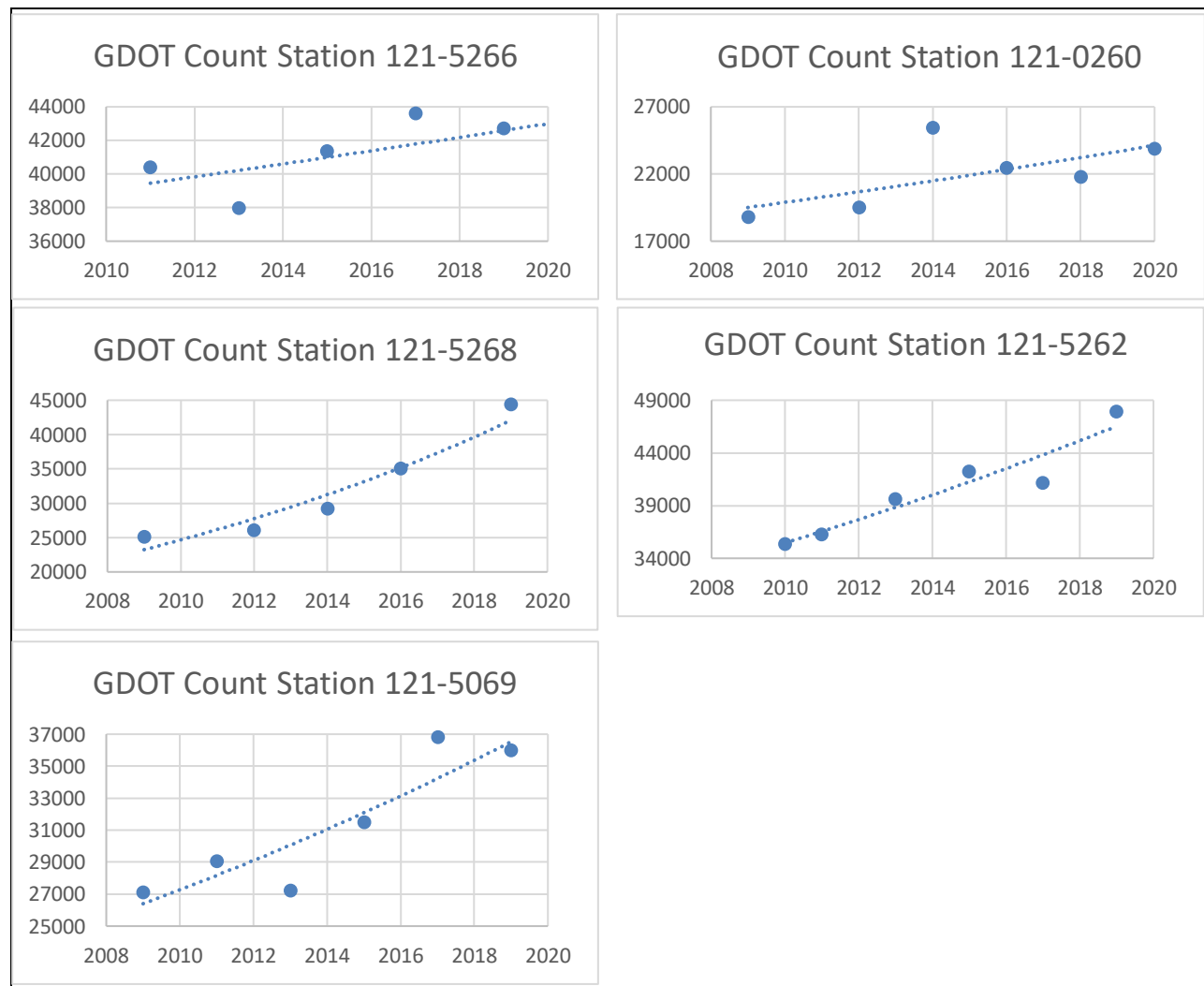
These count stations provide data collected from the Georgia Traffic Monitoring Program located on public roads. The counters are set approximately every 2 years for a period of 48 hours. This data is then processed to obtain hourly traffic volumes, vehicle classification, speeds, and average annual daily traffic (AADT) volumes. The data obtained for each count station along Fulton Industrial Boulevard by year is shown in Table 4.

An exponential curve was fitted to the data of each GDOT count station in order to determine the approximate growth rate at each location. The fitted curve is shown on the data graphs contained in Figure 3. The resulting rate for each count station is shown in the last row of Table 4.

Table 4: Historic GDOT Count Station Data

	Count Station				
	121-0260	121-5262	121-5266	121-5268	121-5069
2021			42563		
2020	23874				
2019		47937	42706	44374	36022
2018	21778				
2017		41154	43595		36822
2016	22424			35029	
2015		42268	41331		31508
2014	25434			29263	
2013		39606	37954		27220
2012	19490			26075	
2011		36282	40398		29077
2009	18762	35357		25122	27126
% growth	1.93%	3.02%	0.95%	5.92%	3.25%

Figure 3: Count Station Graphs



The average annual traffic volume growth rate for the years 2009 to 2021 is calculated to be 3.0%, however, a 3% growth rate is not sustainable through time. Previous studies for similarly built areas show a growth rate of approximately 1.5%. Therefore, a 1.5% growth rate will be used to forecast the traffic volumes for 2031, a 10-year horizon. This growth rate, compounded, represents an

increase of 16% in traffic by the year 2031 relative to 2021 conditions.

Corridor Analysis of future (2031) conditions:

The same analysis that was performed for the four roadway segments on Fulton Industrial Boulevard was repeated for the 2031 projected traffic volumes. This analysis was performed in order to determine if the corridor would present any deterioration in capacity based only on the projected growth of 1.5% per year. It was assumed that the proportion of trucks that utilize the corridor would remain the same. It was also assumed that the peak hour factors would remain the same. The results of the analysis for the four corridor segments is shown on Table 5.

Table 5: 2031 Multi-Lane Analysis Input Data and LOS - Fulton Industrial Boulevard

		Peak hour volume	Segment length (mi)	Access Points per Mile	Peak hour factor	Truck Percentage	LOS (Density in pc/mi/ln)
FIB from Campbellton Road to Camp Creek Pkwy.	NB	1114	3.48	4	0.93	10%	B (12.5)
	SB	1456		5	0.95	10%	B (16.0)
FIB from Camp Creek Pkwy to Wharton Drive SW	NB	1832	2.55	7	0.92	8%	C (24.8)
	SB	1456		7	0.98	9%	C (18.7)
FIB from Wharton Drive SW to I-20	NB	2093	1.32	17	0.93	9%	C (18.7)
	SB	1795		16	0.95	10%	C (18.4)
FIB from I-20 to Donald Lee Hollowell Pkwy.	NB	1300	2.48	11	0.92	21%	B (17.3)
	SB	1493		13	0.92	20%	D (30.6)

The results of the multi-lane roadway segment analysis for the future 2031 forecasted traffic volumes show that congestion levels would remain in the acceptable range (LOS D or lower). The worst performing roadway segment remains the southbound lanes of Fulton Industrial Boulevard from Donald Lee Hollowell Parkway to Interstate I-20. In this case the LOS has remained at D while the density has increased from 26.4 pc/mi/ln to 30.6 pc/mi/ln.

The analysis of these four segments of the Fulton Industrial Boulevard corridor shows that widening of Fulton Industrial Boulevard would not be necessary by the year 2031 since the traffic density would remain at acceptable levels of service despite the projected growth rate of 1.5% per year. If any congestion issued should arise along the corridor, it would likely be due to intersection or traffic signal design issues and could be addressed as such. The intersection analysis for future 2031 conditions which is described in the following section, should identify any future intersection design or signal design issues that may arise.

Intersection analysis – Future (2031) Conditions:

An analysis was performed for traffic forecasted for 2031 with the same geometry and design features as the existing (2021) conditions. The analysis was performed to detect any problems that may become apparent in the future and to identify potential solutions. The results of the intersection capacity analysis are shown on Table 6:

Table 6: LOS and Delay Results Summary for Future, 2031 Conditions.

Location	Control Type	AM		PM	
		LOS	Delay (s)	LOS	Delay (s)
Fulton Industrial @ SR 166/Campbellton Rd	Signal	C	21.4	D	43.0
Fulton Industrial @ Westgate Pkwy (S)	Stop	F	109.2	F	1231.0
Fulton Industrial @ Westgate Pkwy (N)	Stop	F	804.9	F	868.7
Fulton Industrial @ Tradewater Pkwy/Riverside Dr.	Stop	F	399.3	F	2274.1
Fulton Industrial @ Boat Rock Rd.	Signal	C	24.2	C	25.9
Fulton Industrial @ Lakeview Ct.	Signal	B	10.1	A	9.5
Fulton Industrial @ Camp Creek Pkwy	Signal	C	30.5	C	32.6
Fulton Industrial @ Great SW Pkwy/Cascade Rd.	Signal	D	49.2	F	85.5
v-Fulton Industrial @ Villanova / Westpark Pl	Stop	F	1620.8	F	13225.8
Fulton Industrial @ Great SW Pkwy	Signal	C	20.8	B	15.9
Fulton Industrial @ Bakers Ferry Rd	Signal	B	14.2	B	15.0
Fulton Industrial @ Wharton Dr/Mendel Dr.	Signal	B	12.2	C	22.0
Fulton Industrial @ Marvin Miller Dr	Signal	A	7.6	A	6.0
Fulton Industrial @ Patton Drive	Signal	F	116.1	D	50.2
Fulton Industrial @ Commerce Circle (signal)	Signal	A	8.7	B	11.0
Fulton Industrial @ Fulton Industrial Circle	Stop	A	9.0	A	8.9
Fulton Industrial @ Shirley Dr	Signal	A	5.0	A	5.1
Fulton Industrial @ I-20 SB ramps	Signal	E	58.5	D	35.1
Fulton Industrial @ I-20 NB ramps	Signal	C	27.7	C	31.7
Fulton Industrial @ Wendell Dr	Signal	A	5.3	B	11.9
Fulton Industrial @ MLK Jr. Dr.	Signal	E	58.3	F	88.2
Fulton Industrial @ Aviation Circle/Old Gordon Rd.	Signal	B	10.7	B	14.7
Fulton Industrial @ UPS north driveway	Signal	B	13.8	B	11.2
Donald Lee Hollowell Pkwy @ Atlanta Ind. Pkwy.	Signal	A	6.7	A	8.1
Fulton Industrial Blvd @ Donald Lee Hollowell (SR 8)	Signal	D	38.1	C	29.4
SR 8 @ Bolton Rd	Signal	A	9.3	B	16.6
SR 8 @ I-285 SB Ramps	Signal	D	52.9	C	33.1
SR 8 @ I-285 NB Ramps	Signal	C	23.6	C	26.4

The analysis for the future, 2031, forecasted volumes show that the unsignalized intersections that had failing levels of service, continue to display failing levels of service, which is expected. These intersections, as described previously, would benefit from signalization.

Three signalized intersections, however, show deterioration in their LOS and delays: Fulton Industrial Boulevard at Great SW Parkway/Cascade Road, which went from a LOS D with 50.3 seconds delay to a LOS F with 85.5 seconds delay in the PM peak hour; Fulton Industrial Boulevard

at Patton Drive, which went from a LOS E with 61.3 seconds of delay to a LOS F with 116.1 seconds of delay in the AM peak hour; and Fulton Industrial Boulevard at MLK Jr. Drive, which went from a LOS D with 49.8 second delay to LOS F with 88.2 seconds of delay during the PM peak hour.

These three intersections would require geometric improvements to mitigate the congestion caused by the projected growth in traffic volumes. A preliminary analysis shows that the intersection of Fulton Industrial Boulevard at Great SW Parkway/Cascade Road would improve to a LOS D with 54.4 seconds delay if a dual right turn lane was added to the Eastbound approach, converting the existing shared thru-right lane to a thru lane only, and if the westbound (Cascade Road) approach was converted from a single shared left-thru-right lane to three lanes (a left turn lane, a thru lane and a right turn lane) rather than a single lane.

Patton Drive would improve to a LOS D with 36.1 seconds of average delay, if a second left turn lane was implemented on Fulton Industrial Boulevard in the northbound direction, and the westbound approach of Patton Drive was provided with two lanes (a left-thru and a thru-right).

Similarly, a preliminary analysis of the intersection of Fulton Industrial Boulevard at MLK Jr. Drive revealed that the level of service and delay at this location would improve to a LOS D with an average delay of 48.3 seconds if a third southbound through lane was added to Fulton Industrial Boulevard. The Synchro analysis reports for these three intersections, with the described improvements, are included in the Appendix.

Conclusions and Recommendations:

The multilane roadway segment capacity analysis of the Fulton Industrial Boulevard corridor revealed that the existing number of lanes from SR 166 (Campbellton Road) to SR 8 (Donald Lee Holloway Parkway) is adequate for the traffic volumes and truck percentages that currently travel this roadway. Furthermore, the roadway would continue to operate at acceptable levels of service for the next 10 years, as a minimum, without any need for widening of any segment between SR 166 and SR 8. The segment of Fulton Industrial Boulevard which performs the least favorably is the segment between Interstate I-20 and SR 8 (Donald Lee Holloway Parkway). This is due to the higher number of driveways and side streets, especially in the vicinity of I-20, and the higher number of truck traffic present in this segment. However, the level of service for this segment is a “D” through the year 2031, which is in the acceptable range for this type of facility. Therefore, roadway widening is not recommended for any segment of Fulton Industrial Boulevard at this time or in the near future.

The intersection capacity analysis revealed that four unsignalized intersections along the corridor may require signalization at point in the future. The lack of adequate gaps on Fulton industrial Boulevard, high side-street volumes, in addition to a high percentage of heavy vehicles entering Fulton Industrial Boulevard from the side-streets is the likely cause of the delays at these stop-controlled intersections that could be reduced by the installation of traffic control signals. The four intersections in question are:

- Fulton Industrial Boulevard at Westgate Parkway (S)
- Fulton Industrial Boulevard at Westgate Parkway (N)
- Fulton Industrial Boulevard at Tradewater Pkwy/Riverside Drive
- Fulton Industrial Boulevard at Villanova / Westpark Place.

It is recommended that a traffic signal warrant analysis be performed for these four locations and that, if warranted, signalization or other means of intersection control, as determined by GDOT’s intersection control evaluation (ICE) methodology, be pursued.

The intersection capacity analysis also identified a failing levels of service at two intersections by the year 2031. Different intersection improvements were tried in order to resolve the issues and further analyses were made to determine the effect of the measures. The results determined that in order to reduce delays and improve the levels of service at these three intersections the following improvements would be necessary:

Fulton Industrial Boulevard at Great SW Parkway/Cascade Road:

- Add a dual right-turn lane on Great SW Parkway (eastbound approach).
- Add a left turn lane and a right turn lane to Cascade Road (westbound approach)

Fulton Industrial Boulevard at Patton Drive:

- Add a second left turn lane on Fulton Industrial Boulevard in the northbound direction.
- Widen the westbound approach of Patton Drive to two lanes (a left-thru and a thru-right lane).

Fulton Industrial Boulevard at MLK Jr. Drive:

- Add a 3rd southbound through lane to Fulton Industrial Boulevard. Currently the southbound approach to MLK Jr. Drive has three lanes, but one becomes a right-turn lane (drop lane) into MLK Jr. Drive while the southbound departing leg has three lanes, one being a pick-up lane from the MLK Jr. Drive Eastbound right turn. Therefore, widening of Fulton Industrial

Boulevard would not be necessary to accommodate an additional southbound through lane. Additionally, although the intersection of Fulton Industrial Boulevard at Campbellton Road (SR 166) will continue to perform at acceptable levels of service through 2031, it was observed that during the PM peak hour the westbound through movement (on Campbellton Road) presents an average delay of 45.5 seconds (LOS D), which generates a 95th percentile queue of 490 feet. This queue may cause difficulty for vehicles exiting the newly built BP gas station on the south-east corner of this intersection, attempting to turn left onto Campbellton Road. If this becomes an issue in the field, it is recommended that the gas station's driveway be converted to a right-in/right-out driveway as to avoid conflicts and potential crashes involving left-turning vehicles.

RECOMMENDED BY: 

DATE:.....9/15/2021.....

David A. Fairlie, P.E.
Senior Transportation Engineer

Appendix

Contents:

- 48-hour Counts (All Traffic Data)
- Turning Movement Counts (All Traffic Data)
- HCS Roadway Segment Analysis Reports (2021)
- HCS Roadway Segment Analysis Reports (2031)
- 2021 Intersection Analysis Reports (AM and PM)
- 2031 Intersection Analysis Reports (AM and PM)
- 2031 Intersections with Improvements Analysis Reports (AM and PM)

48-Hour Counts (All Traffic Data)

All Traffic Data Services

www.alltrafficdata.net

Page 1

Site Code: 1

Station ID: 1

FULTON IND BLVD NORTH OF RIVERSIDE DR

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

NB

Start Time	Lights	Mediums	Trucks	Total
05/05/21	32	1	4	37
00:15	17	0	4	21
00:30	16	2	6	24
00:45	16	0	8	24
	81	3	22	106
01:00	14	0	3	17
01:15	11	0	6	17
01:30	17	0	6	23
01:45	17	1	4	22
	59	1	19	79
02:00	5	0	5	10
02:15	16	2	2	20
02:30	22	2	3	27
02:45	12	1	4	17
	55	5	14	74
03:00	12	0	2	14
03:15	26	2	2	30
03:30	21	1	0	22
03:45	24	1	3	28
	83	4	7	94
04:00	25	4	7	36
04:15	23	2	3	28
04:30	50	0	6	56
04:45	38	3	4	45
	136	9	20	165
05:00	54	0	2	56
05:15	85	2	6	93
05:30	105	5	7	117
05:45	122	6	6	134
	366	13	21	400
06:00	123	2	6	131
06:15	142	2	4	148
06:30	174	9	9	192
06:45	211	8	9	228
	650	21	28	699
07:00	175	6	8	189
07:15	191	5	15	211
07:30	215	16	18	249
07:45	219	9	15	243
	800	36	56	892
08:00	177	13	13	203
08:15	184	12	18	214
08:30	201	9	18	228
08:45	161	11	18	190
	723	45	67	835
09:00	115	15	23	153
09:15	120	11	24	155
09:30	114	8	18	140
09:45	114	9	21	144
	463	43	86	592
10:00	138	21	22	181
10:15	129	12	14	155
10:30	153	10	25	188
10:45	166	24	24	214
	586	67	85	738
11:00	140	13	35	188
11:15	108	11	17	136
11:30	159	12	24	195
11:45	143	13	23	179
	550	49	99	698
Total	4552	296	524	5372
Percent	84.7%	5.5%	9.8%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Site Code: 1

Station ID: 1

FULTON IND BLVD NORTH OF RIVERSIDE DR

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

NB

Start Time	Lights	Mediums	Trucks	Total
12 PM	169	17	18	204
12:15	120	13	19	152
12:30	137	12	24	173
12:45	103	5	19	127
	529	47	80	656
13:00	132	10	18	160
13:15	138	5	16	159
13:30	111	13	29	153
13:45	130	9	30	169
	511	37	93	641
14:00	96	17	21	134
14:15	129	8	11	148
14:30	119	6	16	141
14:45	131	13	16	160
	475	44	64	583
15:00	143	10	15	168
15:15	161	5	20	186
15:30	178	13	21	212
15:45	141	11	18	170
	623	39	74	736
16:00	150	10	18	178
16:15	146	14	17	177
16:30	146	6	15	167
16:45	152	9	15	176
	594	39	65	698
17:00	175	3	17	195
17:15	134	8	15	157
17:30	148	8	13	169
17:45	114	8	11	133
	571	27	56	654
18:00	121	9	15	145
18:15	124	10	12	146
18:30	118	6	12	136
18:45	111	4	12	127
	474	29	51	554
19:00	100	7	13	120
19:15	101	10	12	123
19:30	86	6	9	101
19:45	86	5	7	98
	373	28	41	442
20:00	86	6	11	103
20:15	99	2	7	108
20:30	106	1	8	115
20:45	78	2	7	87
	369	11	33	413
21:00	56	5	12	73
21:15	66	0	8	74
21:30	58	1	7	66
21:45	54	2	10	66
	234	8	37	279
22:00	44	0	6	50
22:15	37	1	6	44
22:30	54	1	3	58
22:45	57	1	5	63
	192	3	20	215
23:00	51	2	7	60
23:15	28	1	3	32
23:30	39	0	3	42
23:45	28	0	9	37
	146	3	22	171
Total	5091	315	636	6042
Percent	84.3%	5.2%	10.5%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 3

Site Code: 1

Station ID: 1

FULTON IND BLVD NORTH OF RIVERSIDE DR

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

NB

Start Time	Lights	Mediums	Trucks	Total
05/06/21	36	5	1	42
00:15	28	4	1	33
00:30	23	3	1	27
00:45	22	3	4	29
	109	15	7	131
01:00	23	0	6	29
01:15	22	0	1	23
01:30	25	0	3	28
01:45	14	0	5	19
	84	0	15	99
02:00	18	1	2	21
02:15	18	1	7	26
02:30	22	0	3	25
02:45	14	1	5	20
	72	3	17	92
03:00	23	1	5	29
03:15	18	5	4	27
03:30	27	6	1	34
03:45	29	1	4	34
	97	13	14	124
04:00	29	1	3	33
04:15	21	4	4	29
04:30	50	3	2	55
04:45	48	2	3	53
	148	10	12	170
05:00	47	1	6	54
05:15	86	4	2	92
05:30	108	5	7	120
05:45	104	1	6	111
	345	11	21	377
06:00	138	6	2	146
06:15	136	7	9	152
06:30	183	3	6	192
06:45	202	9	3	214
	659	25	20	704
07:00	197	7	10	214
07:15	213	7	15	235
07:30	237	13	14	264
07:45	224	13	8	245
	871	40	47	958
08:00	178	20	18	216
08:15	191	14	10	215
08:30	155	12	16	183
08:45	150	11	19	180
	674	57	63	794
09:00	124	8	20	152
09:15	119	12	17	148
09:30	104	15	33	152
09:45	110	17	21	148
	457	52	91	600
10:00	108	12	14	134
10:15	126	18	20	164
10:30	153	16	30	199
10:45	161	16	33	210
	548	62	97	707
11:00	130	19	30	179
11:15	108	10	23	141
11:30	152	18	22	192
11:45	120	20	21	161
	510	67	96	673
Total	4574	355	500	5429
Percent	84.3%	6.5%	9.2%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 4

Site Code: 1

Station ID: 1

FULTON IND BLVD NORTH OF RIVERSIDE DR

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

NB

Start Time	Lights	Mediums	Trucks	Total
12 PM	140	23	23	186
12:15	127	10	28	165
12:30	121	11	22	154
12:45	128	12	25	165
	516	56	98	670
13:00	122	11	12	145
13:15	89	18	16	123
13:30	120	11	25	156
13:45	114	6	26	146
	445	46	79	570
14:00	109	11	28	148
14:15	126	13	25	164
14:30	143	20	22	185
14:45	106	9	14	129
	484	53	89	626
15:00	130	11	24	165
15:15	137	11	24	172
15:30	149	13	37	199
15:45	146	5	15	166
	562	40	100	702
16:00	156	7	16	179
16:15	140	7	24	171
16:30	177	14	24	215
16:45	146	8	19	173
	619	36	83	738
17:00	153	7	19	179
17:15	152	7	17	176
17:30	156	10	14	180
17:45	148	8	7	163
	609	32	57	698
18:00	122	4	7	133
18:15	140	6	15	161
18:30	109	10	13	132
18:45	112	8	11	131
	483	28	46	557
19:00	99	5	6	110
19:15	91	2	13	106
19:30	92	3	4	99
19:45	79	5	5	89
	361	15	28	404
20:00	78	2	17	97
20:15	88	5	7	100
20:30	113	3	8	124
20:45	100	4	13	117
	379	14	45	438
21:00	68	0	5	73
21:15	86	6	6	98
21:30	71	1	7	79
21:45	49	0	6	55
	274	7	24	305
22:00	42	3	11	56
22:15	57	4	4	65
22:30	55	1	2	58
22:45	49	2	6	57
	203	10	23	236
23:00	49	1	6	56
23:15	37	4	7	48
23:30	26	2	4	32
23:45	23	0	1	24
	135	7	18	160
Total	5070	344	690	6104
Percent	83.1%	5.6%	11.3%	100.0%
Grand Total	19287	1310	2350	22947
Percent	84.1%	5.7%	10.2%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Site Code: 1

Station ID: 1

FULTON IND BLVD NORTH OF RIVERSIDE DR

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

SB

Start Time	Lights	Mediums	Trucks	Total
05/05/21	29	1	3	33
00:15	31	1	6	38
00:30	32	1	10	43
00:45	19	2	4	25
	111	5	23	139
01:00	36	2	5	43
01:15	25	1	0	26
01:30	15	1	3	19
01:45	18	1	3	22
	94	5	11	110
02:00	11	1	1	13
02:15	12	0	1	13
02:30	22	1	0	23
02:45	10	0	5	15
	55	2	7	64
03:00	18	1	2	21
03:15	16	2	2	20
03:30	10	1	6	17
03:45	20	1	3	24
	64	5	13	82
04:00	15	1	6	22
04:15	14	1	1	16
04:30	29	1	3	33
04:45	31	1	5	37
	89	4	15	108
05:00	18	3	6	27
05:15	42	3	8	53
05:30	45	4	12	61
05:45	86	2	12	100
	191	12	38	241
06:00	60	5	10	75
06:15	58	6	12	76
06:30	68	5	14	87
06:45	139	5	9	153
	325	21	45	391
07:00	107	13	19	139
07:15	86	8	14	108
07:30	108	11	11	130
07:45	113	8	19	140
	414	40	63	517
08:00	114	10	17	141
08:15	105	15	16	136
08:30	86	11	23	120
08:45	92	7	21	120
	397	43	77	517
09:00	88	14	38	140
09:15	105	11	28	144
09:30	96	8	26	130
09:45	134	14	21	169
	423	47	113	583
10:00	114	12	31	157
10:15	91	22	20	133
10:30	116	9	22	147
10:45	116	10	23	149
	437	53	96	586
11:00	128	18	27	173
11:15	100	10	26	136
11:30	105	8	21	134
11:45	114	12	18	144
	447	48	92	587
Total	3047	285	593	3925
Percent	77.6%	7.3%	15.1%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Site Code: 1

Station ID: 1

FULTON IND BLVD NORTH OF RIVERSIDE DR

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

SB

Start Time	Lights	Mediums	Trucks	Total
12 PM	110	12	29	151
12:15	118	15	15	148
12:30	126	7	23	156
12:45	136	7	19	162
	490	41	86	617
13:00	111	13	20	144
13:15	117	10	24	151
13:30	107	14	19	140
13:45	132	12	16	160
	467	49	79	595
14:00	110	9	13	132
14:15	114	8	25	147
14:30	147	15	24	186
14:45	137	12	16	165
	508	44	78	630
15:00	166	15	17	198
15:15	181	15	30	226
15:30	198	12	21	231
15:45	201	12	22	235
	746	54	90	890
16:00	213	10	14	237
16:15	225	11	24	260
16:30	266	5	14	285
16:45	231	9	18	258
	935	35	70	1040
17:00	306	9	18	333
17:15	282	14	12	308
17:30	249	8	15	272
17:45	245	8	19	272
	1082	39	64	1185
18:00	208	10	16	234
18:15	216	6	16	238
18:30	169	5	11	185
18:45	162	8	10	180
	755	29	53	837
19:00	131	3	10	144
19:15	153	6	18	177
19:30	137	7	18	162
19:45	140	0	10	150
	561	16	56	633
20:00	125	6	10	141
20:15	122	8	15	145
20:30	115	2	11	128
20:45	100	1	11	112
	462	17	47	526
21:00	80	1	9	90
21:15	80	2	9	91
21:30	86	1	6	93
21:45	75	3	11	89
	321	7	35	363
22:00	68	3	4	75
22:15	68	0	4	72
22:30	62	2	3	67
22:45	61	2	5	68
	259	7	16	282
23:00	80	0	10	90
23:15	70	3	3	76
23:30	65	1	2	68
23:45	57	0	2	59
	272	4	17	293
Total	6858	342	691	7891
Percent	86.9%	4.3%	8.8%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 7

Site Code: 1

Station ID: 1

FULTON IND BLVD NORTH OF RIVERSIDE DR

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

SB

Start Time	Lights	Mediums	Trucks	Total
05/06/21	47	1	2	50
00:15	43	1	2	46
00:30	29	1	2	32
00:45	34	1	4	39
	153	4	10	167
01:00	34	0	1	35
01:15	34	1	4	39
01:30	19	0	1	20
01:45	19	2	3	24
	106	3	9	118
02:00	31	2	5	38
02:15	28	0	2	30
02:30	20	1	2	23
02:45	29	1	5	35
	108	4	14	126
03:00	18	0	1	19
03:15	24	3	4	31
03:30	20	3	1	24
03:45	33	3	2	38
	95	9	8	112
04:00	21	3	6	30
04:15	19	2	6	27
04:30	36	1	4	41
04:45	45	2	7	54
	121	8	23	152
05:00	20	4	4	28
05:15	39	3	3	45
05:30	48	3	15	66
05:45	87	2	9	98
	194	12	31	237
06:00	65	4	12	81
06:15	56	3	11	70
06:30	69	5	14	88
06:45	134	7	13	154
	324	19	50	393
07:00	108	9	14	131
07:15	96	17	14	127
07:30	116	12	17	145
07:45	122	14	20	156
	442	52	65	559
08:00	111	11	13	135
08:15	99	8	18	125
08:30	81	19	12	112
08:45	91	11	22	124
	382	49	65	496
09:00	97	12	23	132
09:15	109	16	24	149
09:30	81	16	24	121
09:45	118	23	15	156
	405	67	86	558
10:00	107	13	20	140
10:15	112	8	31	151
10:30	83	17	29	129
10:45	104	10	17	131
	406	48	97	551
11:00	107	10	34	151
11:15	92	12	24	128
11:30	84	18	33	135
11:45	96	10	19	125
	379	50	110	539
Total	3115	325	568	4008
Percent	77.7%	8.1%	14.2%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Site Code: 1

Station ID: 1

FULTON IND BLVD NORTH OF RIVERSIDE DR

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

SB

Start Time	Lights	Mediums	Trucks	Total
12 PM	109	10	25	144
12:15	102	14	12	128
12:30	120	12	23	155
12:45	121	18	13	152
	452	54	73	579
13:00	94	16	29	139
13:15	116	9	25	150
13:30	135	20	15	170
13:45	159	9	18	186
	504	54	87	645
14:00	159	14	29	202
14:15	137	7	18	162
14:30	177	14	15	206
14:45	169	8	30	207
	642	43	92	777
15:00	178	6	22	206
15:15	185	10	18	213
15:30	195	5	21	221
15:45	212	9	17	238
	770	30	78	878
16:00	228	14	20	262
16:15	238	8	18	264
16:30	297	9	12	318
16:45	245	10	23	278
	1008	41	73	1122
17:00	306	10	25	341
17:15	293	9	16	318
17:30	270	12	13	295
17:45	237	5	7	249
	1106	36	61	1203
18:00	218	6	12	236
18:15	206	5	10	221
18:30	174	3	16	193
18:45	140	5	14	159
	738	19	52	809
19:00	154	7	7	168
19:15	139	5	7	151
19:30	146	4	13	163
19:45	137	2	15	154
	576	18	42	636
20:00	153	5	14	172
20:15	160	4	18	182
20:30	112	1	15	128
20:45	122	1	7	130
	547	11	54	612
21:00	96	0	6	102
21:15	91	1	11	103
21:30	90	6	7	103
21:45	78	3	11	92
	355	10	35	400
22:00	99	6	3	108
22:15	120	3	3	126
22:30	79	1	7	87
22:45	61	1	6	68
	359	11	19	389
23:00	102	1	3	106
23:15	62	2	4	68
23:30	50	1	2	53
23:45	54	0	4	58
	268	4	13	285
Total	7325	331	679	8335
Percent	87.9%	4.0%	8.1%	100.0%
Grand Total	20345	1283	2531	24159
Percent	84.2%	5.3%	10.5%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 1

Site Code: 2

Station ID: 2

FULTON IND BLVD NORTH OF CASCADE ROAD

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

NB

Start Time	Lights	Mediums	Trucks	Total
05/05/21	35	5	5	45
00:15	27	4	8	39
00:30	47	2	9	58
00:45	24	3	6	33
	133	14	28	175
01:00	31	1	9	41
01:15	27	1	4	32
01:30	28	1	6	35
01:45	23	2	7	32
	109	5	26	140
02:00	16	2	4	22
02:15	22	2	10	34
02:30	33	1	4	38
02:45	32	4	3	39
	103	9	21	133
03:00	18	1	10	29
03:15	23	1	5	29
03:30	22	1	10	33
03:45	21	1	4	26
	84	4	29	117
04:00	36	2	10	48
04:15	31	6	5	42
04:30	62	3	6	71
04:45	55	2	7	64
	184	13	28	225
05:00	62	3	8	73
05:15	104	3	10	117
05:30	126	5	7	138
05:45	171	6	11	188
	463	17	36	516
06:00	161	6	12	179
06:15	224	2	6	232
06:30	266	15	7	288
06:45	303	8	7	318
	954	31	32	1017
07:00	322	14	16	352
07:15	354	15	19	388
07:30	336	16	27	379
07:45	353	28	16	397
	1365	73	78	1516
08:00	318	18	18	354
08:15	300	16	20	336
08:30	253	21	26	300
08:45	251	18	25	294
	1122	73	89	1284
09:00	199	15	29	243
09:15	193	20	23	236
09:30	189	13	27	229
09:45	174	16	27	217
	755	64	106	925
10:00	180	19	36	235
10:15	200	15	27	242
10:30	204	15	24	243
10:45	237	17	27	281
	821	66	114	1001
11:00	271	11	31	313
11:15	275	22	28	325
11:30	256	15	19	290
11:45	236	11	39	286
	1038	59	117	1214
Total	7131	428	704	8263
Percent	86.3%	5.2%	8.5%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 2

Site Code: 2

Station ID: 2

FULTON IND BLVD NORTH OF CASCADE ROAD

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

NB

Start Time	Lights	Mediums	Trucks	Total
12 PM	245	22	31	298
12:15	246	24	37	307
12:30	231	23	30	284
12:45	177	10	23	210
	899	79	121	1099
13:00	232	17	21	270
13:15	247	15	29	291
13:30	193	21	24	238
13:45	207	18	31	256
	879	71	105	1055
14:00	209	15	30	254
14:15	246	18	18	282
14:30	245	11	28	284
14:45	258	22	19	299
	958	66	95	1119
15:00	238	12	19	269
15:15	268	9	26	303
15:30	296	9	24	329
15:45	269	17	19	305
	1071	47	88	1206
16:00	267	15	21	303
16:15	243	15	20	278
16:30	302	14	11	327
16:45	284	13	16	313
	1096	57	68	1221
17:00	275	8	16	299
17:15	292	8	15	315
17:30	262	13	10	285
17:45	250	12	10	272
	1079	41	51	1171
18:00	270	9	18	297
18:15	216	6	16	238
18:30	234	18	15	267
18:45	201	7	6	214
	921	40	55	1016
19:00	169	9	10	188
19:15	149	9	12	170
19:30	154	9	14	177
19:45	130	8	8	146
	602	35	44	681
20:00	123	5	10	138
20:15	129	4	11	144
20:30	168	5	12	185
20:45	123	6	13	142
	543	20	46	609
21:00	98	4	9	111
21:15	95	4	13	112
21:30	105	2	7	114
21:45	79	4	6	89
	377	14	35	426
22:00	79	1	9	89
22:15	67	1	8	76
22:30	88	2	11	101
22:45	100	2	11	113
	334	6	39	379
23:00	59	4	13	76
23:15	59	2	8	69
23:30	64	1	8	73
23:45	36	1	4	41
	218	8	33	259
Total	8977	484	780	10241
Percent	87.7%	4.7%	7.6%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 3

Site Code: 2

Station ID: 2

FULTON IND BLVD NORTH OF CASCADE ROAD

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

NB

Start Time	Lights	Mediums	Trucks	Total
05/06/21	50	1	10	61
00:15	50	1	7	58
00:30	50	3	7	60
00:45	27	2	10	39
	177	7	34	218
01:00	39	0	7	46
01:15	36	2	4	42
01:30	31	1	6	38
01:45	23	1	1	25
	129	4	18	151
02:00	26	1	8	35
02:15	25	2	9	36
02:30	35	4	4	43
02:45	43	1	9	53
	129	8	30	167
03:00	24	0	11	35
03:15	32	4	7	43
03:30	28	2	7	37
03:45	34	3	6	43
	118	9	31	158
04:00	45	2	8	55
04:15	24	4	14	42
04:30	63	4	8	75
04:45	65	0	10	75
	197	10	40	247
05:00	71	6	10	87
05:15	108	3	2	113
05:30	119	5	6	130
05:45	165	8	7	180
	463	22	25	510
06:00	176	5	8	189
06:15	236	9	14	259
06:30	261	6	10	277
06:45	326	11	7	344
	999	31	39	1069
07:00	353	12	18	383
07:15	361	12	23	396
07:30	350	12	23	385
07:45	354	13	24	391
	1418	49	88	1555
08:00	366	23	18	407
08:15	295	20	21	336
08:30	234	21	24	279
08:45	246	13	20	279
	1141	77	83	1301
09:00	200	12	25	237
09:15	173	21	24	218
09:30	183	15	24	222
09:45	181	16	33	230
	737	64	106	907
10:00	187	19	19	225
10:15	192	22	31	245
10:30	194	15	28	237
10:45	186	25	39	250
	759	81	117	957
11:00	208	21	32	261
11:15	188	23	40	251
11:30	188	18	21	227
11:45	223	28	25	276
	807	90	118	1015
Total	7074	452	729	8255
Percent	85.7%	5.5%	8.8%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 4

Site Code: 2

Station ID: 2

FULTON IND BLVD NORTH OF CASCADE ROAD

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

NB

Start Time	Lights	Mediums	Trucks	Total
12 PM	221	13	24	258
12:15	257	18	25	300
12:30	232	12	27	271
12:45	217	20	27	264
	927	63	103	1093
13:00	208	20	31	259
13:15	200	23	26	249
13:30	203	15	24	242
13:45	202	12	26	240
	813	70	107	990
14:00	192	19	20	231
14:15	226	13	21	260
14:30	252	22	28	302
14:45	196	17	19	232
	866	71	88	1025
15:00	215	19	20	254
15:15	264	15	17	296
15:30	257	19	25	301
15:45	283	14	20	317
	1019	67	82	1168
16:00	265	13	23	301
16:15	238	5	21	264
16:30	331	20	18	369
16:45	276	21	21	318
	1110	59	83	1252
17:00	328	9	14	351
17:15	299	8	18	325
17:30	314	14	16	344
17:45	300	19	12	331
	1241	50	60	1351
18:00	273	7	14	294
18:15	251	3	13	267
18:30	197	11	13	221
18:45	196	4	9	209
	917	25	49	991
19:00	156	6	17	179
19:15	146	4	12	162
19:30	122	7	10	139
19:45	141	7	8	156
	565	24	47	636
20:00	155	11	8	174
20:15	133	10	12	155
20:30	140	10	12	162
20:45	164	8	11	183
	592	39	43	674
21:00	114	6	12	132
21:15	113	3	4	120
21:30	108	5	4	117
21:45	99	1	9	109
	434	15	29	478
22:00	92	3	8	103
22:15	80	6	7	93
22:30	83	0	9	92
22:45	89	4	11	104
	344	13	35	392
23:00	72	2	11	85
23:15	73	1	13	87
23:30	37	2	11	50
23:45	44	0	6	50
	226	5	41	272
Total	9054	501	767	10322
Percent	87.7%	4.9%	7.4%	100.0%
Grand Total	32236	1865	2980	37081
Percent	86.9%	5.0%	8.0%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 5

Site Code: 2

Station ID: 2

FULTON IND BLVD NORTH OF CASCADE ROAD

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

SB

Start Time	Lights	Mediums	Trucks	Total
05/05/21	51	1	10	62
00:15	48	4	11	63
00:30	33	3	7	43
00:45	35	3	6	44
	167	11	34	212
01:00	50	3	7	60
01:15	30	0	7	37
01:30	33	2	16	51
01:45	24	3	6	33
	137	8	36	181
02:00	29	3	6	38
02:15	29	0	10	39
02:30	18	3	10	31
02:45	19	3	6	28
	95	9	32	136
03:00	36	5	8	49
03:15	27	3	5	35
03:30	28	1	4	33
03:45	30	3	6	39
	121	12	23	156
04:00	23	2	4	29
04:15	42	2	5	49
04:30	54	3	9	66
04:45	53	4	10	67
	172	11	28	211
05:00	48	6	3	57
05:15	55	1	6	62
05:30	105	9	11	125
05:45	131	6	12	149
	339	22	32	393
06:00	95	6	12	113
06:15	113	6	21	140
06:30	131	7	15	153
06:45	207	10	16	233
	546	29	64	639
07:00	147	13	15	175
07:15	150	14	12	176
07:30	158	17	21	196
07:45	188	14	16	218
	643	58	64	765
08:00	186	11	26	223
08:15	180	13	27	220
08:30	140	14	16	170
08:45	165	11	12	188
	671	49	81	801
09:00	134	19	16	169
09:15	174	19	26	219
09:30	175	23	21	219
09:45	187	32	32	251
	670	93	95	858
10:00	141	17	26	184
10:15	164	20	23	207
10:30	178	22	35	235
10:45	160	13	35	208
	643	72	119	834
11:00	188	18	30	236
11:15	191	12	27	230
11:30	210	11	26	247
11:45	175	24	25	224
	764	65	108	937
Total	4968	439	716	6123
Percent	81.1%	7.2%	11.7%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 6

Site Code: 2

Station ID: 2

FULTON IND BLVD NORTH OF CASCADE ROAD

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

SB

Start Time	Lights	Mediums	Trucks	Total
12 PM	183	11	23	217
12:15	179	17	23	219
12:30	187	17	23	227
12:45	197	17	15	229
	746	62	84	892
13:00	199	15	31	245
13:15	205	15	23	243
13:30	190	16	24	230
13:45	220	9	30	259
	814	55	108	977
14:00	191	11	22	224
14:15	224	18	20	262
14:30	205	14	22	241
14:45	209	12	24	245
	829	55	88	972
15:00	259	12	21	292
15:15	236	20	24	280
15:30	301	10	19	330
15:45	237	13	22	272
	1033	55	86	1174
16:00	369	16	18	403
16:15	252	11	25	288
16:30	287	9	19	315
16:45	273	18	20	311
	1181	54	82	1317
17:00	312	6	12	330
17:15	273	11	13	297
17:30	273	8	18	299
17:45	260	7	20	287
	1118	32	63	1213
18:00	257	8	14	279
18:15	242	11	14	267
18:30	208	4	17	229
18:45	187	10	10	207
	894	33	55	982
19:00	208	7	18	233
19:15	157	11	15	183
19:30	189	9	11	209
19:45	173	6	11	190
	727	33	55	815
20:00	151	3	12	166
20:15	190	4	16	210
20:30	126	5	11	142
20:45	109	3	11	123
	576	15	50	641
21:00	101	4	14	119
21:15	136	1	4	141
21:30	115	7	7	129
21:45	117	5	15	137
	469	17	40	526
22:00	95	1	6	102
22:15	100	5	6	111
22:30	96	2	4	102
22:45	143	0	9	152
	434	8	25	467
23:00	105	2	10	117
23:15	114	4	8	126
23:30	108	2	5	115
23:45	63	1	7	71
	390	9	30	429
Total	9211	428	766	10405
Percent	88.5%	4.1%	7.4%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 7

Site Code: 2

Station ID: 2

FULTON IND BLVD NORTH OF CASCADE ROAD

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

SB

Start Time	Lights	Mediums	Trucks	Total
05/06/21	58	3	7	68
00:15	68	3	6	77
00:30	70	4	9	83
00:45	62	3	2	67
	258	13	24	295
01:00	50	1	8	59
01:15	42	1	4	47
01:30	44	1	5	50
01:45	32	3	7	42
	168	6	24	198
02:00	29	2	7	38
02:15	36	1	6	43
02:30	42	0	9	51
02:45	48	3	7	58
	155	6	29	190
03:00	39	2	7	48
03:15	42	3	4	49
03:30	42	6	3	51
03:45	42	0	5	47
	165	11	19	195
04:00	33	3	8	44
04:15	39	4	10	53
04:30	70	4	7	81
04:45	66	9	3	78
	208	20	28	256
05:00	67	3	7	77
05:15	60	6	8	74
05:30	105	6	13	124
05:45	115	9	9	133
	347	24	37	408
06:00	107	4	11	122
06:15	122	3	15	140
06:30	170	15	14	199
06:45	187	9	8	204
	586	31	48	665
07:00	158	8	16	182
07:15	206	24	12	242
07:30	180	22	22	224
07:45	170	18	11	199
	714	72	61	847
08:00	173	16	18	207
08:15	159	13	12	184
08:30	134	15	20	169
08:45	184	21	18	223
	650	65	68	783
09:00	151	11	26	188
09:15	156	20	26	202
09:30	159	26	20	205
09:45	181	33	24	238
	647	90	96	833
10:00	161	25	29	215
10:15	160	25	42	227
10:30	151	14	24	189
10:45	159	17	38	214
	631	81	133	845
11:00	167	23	28	218
11:15	145	16	35	196
11:30	177	24	25	226
11:45	184	21	22	227
	673	84	110	867
Total	5202	503	677	6382
Percent	81.5%	7.9%	10.6%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 8

Site Code: 2

Station ID: 2

FULTON IND BLVD NORTH OF CASCADE ROAD

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

SB

Start Time	Lights	Mediums	Trucks	Total
12 PM	231	19	38	288
12:15	221	21	30	272
12:30	176	16	26	218
12:45	193	16	26	235
	821	72	120	1013
13:00	206	20	31	257
13:15	208	14	28	250
13:30	206	14	21	241
13:45	235	24	31	290
	855	72	111	1038
14:00	214	27	29	270
14:15	218	16	28	262
14:30	224	12	30	266
14:45	243	16	24	283
	899	71	111	1081
15:00	237	15	22	274
15:15	247	10	28	285
15:30	308	10	22	340
15:45	232	13	21	266
	1024	48	93	1165
16:00	345	14	17	376
16:15	284	9	12	305
16:30	312	14	20	346
16:45	288	19	25	332
	1229	56	74	1359
17:00	316	10	22	348
17:15	293	15	10	318
17:30	277	12	16	305
17:45	235	7	22	264
	1121	44	70	1235
18:00	266	12	18	296
18:15	251	7	18	276
18:30	209	7	23	239
18:45	205	9	14	228
	931	35	73	1039
19:00	183	10	14	207
19:15	170	8	17	195
19:30	189	8	14	211
19:45	200	11	9	220
	742	37	54	833
20:00	285	12	21	318
20:15	243	8	18	269
20:30	174	4	14	192
20:45	179	3	7	189
	881	27	60	968
21:00	130	2	6	138
21:15	131	7	8	146
21:30	128	4	11	143
21:45	118	5	4	127
	507	18	29	554
22:00	131	8	6	145
22:15	124	6	5	135
22:30	113	3	8	124
22:45	115	2	12	129
	483	19	31	533
23:00	109	3	8	120
23:15	69	4	7	80
23:30	105	1	3	109
23:45	73	1	7	81
	356	9	25	390
Total	9849	508	851	11208
Percent	87.9%	4.5%	7.6%	100.0%
Grand Total	29230	1878	3010	34118
Percent	85.7%	5.5%	8.8%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 1

Site Code: 3

Station ID: 3

FULTON IND BLVD NORTH OF MENDEL DRIVE

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

NB

Start Time	Lights	Mediums	Trucks	Total
05/05/21	38	3	6	47
00:15	33	2	6	41
00:30	33	2	11	46
00:45	26	3	9	38
	130	10	32	172
01:00	34	4	7	45
01:15	23	1	7	31
01:30	34	2	5	41
01:45	30	2	11	43
	121	9	30	160
02:00	21	2	5	28
02:15	21	4	10	35
02:30	29	3	7	39
02:45	35	3	7	45
	106	12	29	147
03:00	26	1	17	44
03:15	31	4	7	42
03:30	24	4	9	37
03:45	20	4	4	28
	101	13	37	151
04:00	25	2	14	41
04:15	36	5	9	50
04:30	41	8	15	64
04:45	51	4	15	70
	153	19	53	225
05:00	61	6	18	85
05:15	87	11	13	111
05:30	90	15	17	122
05:45	95	12	19	126
	333	44	67	444
06:00	160	16	21	197
06:15	146	13	13	172
06:30	164	21	15	200
06:45	165	12	11	188
	635	62	60	757
07:00	263	29	19	311
07:15	279	25	20	324
07:30	266	29	30	325
07:45	257	36	22	315
	1065	119	91	1275
08:00	236	29	23	288
08:15	231	35	31	297
08:30	204	35	33	272
08:45	206	25	32	263
	877	124	119	1120
09:00	183	26	44	253
09:15	176	18	29	223
09:30	171	17	31	219
09:45	184	17	38	239
	714	78	142	934
10:00	167	33	39	239
10:15	190	35	33	258
10:30	233	20	30	283
10:45	244	31	34	309
	834	119	136	1089
11:00	248	21	44	313
11:15	256	33	42	331
11:30	268	24	23	315
11:45	230	20	45	295
	1002	98	154	1254
Total	6071	707	950	7728
Percent	78.6%	9.1%	12.3%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 2

Site Code: 3

Station ID: 3

FULTON IND BLVD NORTH OF MENDEL DRIVE

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

NB

Start Time	Lights	Mediums	Trucks	Total
12 PM	254	25	38	317
12:15	228	31	38	297
12:30	227	27	37	291
12:45	182	26	30	238
	891	109	143	1143
13:00	209	21	21	251
13:15	248	22	24	294
13:30	224	23	40	287
13:45	227	24	33	284
	908	90	118	1116
14:00	242	21	33	296
14:15	263	20	26	309
14:30	282	18	30	330
14:45	275	23	28	326
	1062	82	117	1261
15:00	308	23	24	355
15:15	328	14	35	377
15:30	477	17	27	521
15:45	308	21	22	351
	1421	75	108	1604
16:00	402	19	23	444
16:15	357	24	28	409
16:30	449	16	16	481
16:45	394	20	16	430
	1602	79	83	1764
17:00	427	10	24	461
17:15	396	12	25	433
17:30	316	9	15	340
17:45	317	11	16	344
	1456	42	80	1578
18:00	372	12	16	400
18:15	285	5	16	306
18:30	270	18	18	306
18:45	248	10	11	269
	1175	45	61	1281
19:00	237	11	13	261
19:15	175	8	14	197
19:30	169	9	13	191
19:45	139	9	14	162
	720	37	54	811
20:00	145	7	13	165
20:15	130	11	13	154
20:30	152	6	13	171
20:45	151	9	12	172
	578	33	51	662
21:00	116	8	12	136
21:15	112	5	17	134
21:30	124	7	9	140
21:45	96	5	9	110
	448	25	47	520
22:00	83	3	9	95
22:15	89	1	10	100
22:30	109	3	9	121
22:45	101	3	9	113
	382	10	37	429
23:00	110	5	13	128
23:15	87	2	9	98
23:30	71	3	13	87
23:45	47	1	6	54
	315	11	41	367
Total	10958	638	940	12536
Percent	87.4%	5.1%	7.5%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 3

Site Code: 3

Station ID: 3

FULTON IND BLVD NORTH OF MENDEL DRIVE

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

NB

Start Time	Lights	Mediums	Trucks	Total
05/06/21	71	4	11	86
00:15	60	4	7	71
00:30	68	5	6	79
00:45	45	2	10	57
	244	15	34	293
01:00	45	3	9	57
01:15	41	4	5	50
01:30	36	3	10	49
01:45	25	3	5	33
	147	13	29	189
02:00	24	0	8	32
02:15	21	2	10	33
02:30	39	4	5	48
02:45	39	5	9	53
	123	11	32	166
03:00	33	3	9	45
03:15	28	6	7	41
03:30	29	6	12	47
03:45	27	3	13	43
	117	18	41	176
04:00	33	4	10	47
04:15	32	4	12	48
04:30	52	8	18	78
04:45	49	6	15	70
	166	22	55	243
05:00	72	6	19	97
05:15	87	8	6	101
05:30	95	13	14	122
05:45	103	16	14	133
	357	43	53	453
06:00	147	15	28	190
06:15	163	18	20	201
06:30	164	29	19	212
06:45	208	16	23	247
	682	78	90	850
07:00	274	33	22	329
07:15	278	29	20	327
07:30	294	20	31	345
07:45	262	18	25	305
	1108	100	98	1306
08:00	260	33	19	312
08:15	267	36	34	337
08:30	218	28	31	277
08:45	190	26	26	242
	935	123	110	1168
09:00	195	23	28	246
09:15	172	36	36	244
09:30	149	26	30	205
09:45	167	27	33	227
	683	112	127	922
10:00	167	23	37	227
10:15	204	34	41	279
10:30	195	33	22	250
10:45	198	40	48	286
	764	130	148	1042
11:00	191	22	38	251
11:15	190	27	48	265
11:30	190	23	40	253
11:45	193	30	29	252
	764	102	155	1021
Total	6090	767	972	7829
Percent	77.8%	9.8%	12.4%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 4

Site Code: 3

Station ID: 3

FULTON IND BLVD NORTH OF MENDEL DRIVE

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

NB

Start Time	Lights	Mediums	Trucks	Total
12 PM	236	27	33	296
12:15	241	32	42	315
12:30	208	24	35	267
12:45	205	23	31	259
	890	106	141	1137
13:00	210	29	40	279
13:15	204	35	28	267
13:30	206	18	34	258
13:45	213	14	27	254
	833	96	129	1058
14:00	225	28	23	276
14:15	229	25	35	289
14:30	275	27	32	334
14:45	246	23	21	290
	975	103	111	1189
15:00	319	23	24	366
15:15	301	26	26	353
15:30	407	25	35	467
15:45	342	16	36	394
	1369	90	121	1580
16:00	408	25	18	451
16:15	368	15	25	408
16:30	443	17	18	478
16:45	386	24	24	434
	1605	81	85	1771
17:00	416	17	25	458
17:15	402	15	20	437
17:30	416	16	19	451
17:45	357	16	12	385
	1591	64	76	1731
18:00	378	12	13	403
18:15	290	6	12	308
18:30	221	12	15	248
18:45	215	8	10	233
	1104	38	50	1192
19:00	207	8	16	231
19:15	175	8	18	201
19:30	153	8	12	173
19:45	157	9	5	171
	692	33	51	776
20:00	150	12	9	171
20:15	142	10	11	163
20:30	147	11	11	169
20:45	191	14	19	224
	630	47	50	727
21:00	136	6	21	163
21:15	131	5	5	141
21:30	118	3	5	126
21:45	103	4	6	113
	488	18	37	543
22:00	105	4	7	116
22:15	93	6	7	106
22:30	97	3	12	112
22:45	93	5	10	108
	388	18	36	442
23:00	111	6	10	127
23:15	98	2	13	113
23:30	54	3	9	66
23:45	45	3	6	54
	308	14	38	360
Total	10873	708	925	12506
Percent	86.9%	5.7%	7.4%	100.0%
Grand Total	33992	2820	3787	40599
Percent	83.7%	6.9%	9.3%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 5

Site Code: 3

Station ID: 3

FULTON IND BLVD NORTH OF MENDEL DRIVE

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

SB

Start Time	Lights	Mediums	Trucks	Total
05/05/21	60	2	15	77
00:15	56	4	8	68
00:30	39	3	8	50
00:45	40	5	9	54
	195	14	40	249
01:00	44	4	6	54
01:15	28	2	7	37
01:30	25	2	18	45
01:45	26	8	6	40
	123	16	37	176
02:00	24	4	9	37
02:15	31	1	5	37
02:30	25	7	9	41
02:45	31	4	7	42
	111	16	30	157
03:00	33	3	3	39
03:15	33	2	4	39
03:30	39	2	10	51
03:45	45	3	7	55
	150	10	24	184
04:00	39	3	6	48
04:15	74	2	7	83
04:30	93	5	16	114
04:45	117	7	8	132
	323	17	37	377
05:00	92	5	5	102
05:15	114	9	10	133
05:30	198	6	13	217
05:45	307	12	14	333
	711	32	42	785
06:00	185	11	17	213
06:15	231	14	25	270
06:30	285	14	17	316
06:45	529	14	23	566
	1230	53	82	1365
07:00	275	18	15	308
07:15	245	24	31	300
07:30	311	29	33	373
07:45	306	14	24	344
	1137	85	103	1325
08:00	309	25	36	370
08:15	229	21	35	285
08:30	231	16	20	267
08:45	240	15	30	285
	1009	77	121	1207
09:00	246	23	31	300
09:15	247	30	23	300
09:30	286	35	41	362
09:45	205	43	33	281
	984	131	128	1243
10:00	217	30	30	277
10:15	212	34	33	279
10:30	231	34	36	301
10:45	216	25	53	294
	876	123	152	1151
11:00	185	20	30	235
11:15	214	18	38	270
11:30	185	25	34	244
11:45	196	33	35	264
	780	96	137	1013
Total	7629	670	933	9232
Percent	82.6%	7.3%	10.1%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 6

Site Code: 3

Station ID: 3

FULTON IND BLVD NORTH OF MENDEL DRIVE

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

SB

Start Time	Lights	Mediums	Trucks	Total
12 PM	175	19	33	227
12:15	194	20	35	249
12:30	196	29	30	255
12:45	199	21	32	252
	764	89	130	983
13:00	183	26	35	244
13:15	196	17	31	244
13:30	216	31	31	278
13:45	207	21	36	264
	802	95	133	1030
14:00	213	22	35	270
14:15	241	33	44	318
14:30	250	29	24	303
14:45	246	34	34	314
	950	118	137	1205
15:00	223	30	29	282
15:15	224	34	25	283
15:30	229	24	26	279
15:45	204	23	21	248
	880	111	101	1092
16:00	255	23	23	301
16:15	220	19	28	267
16:30	225	14	20	259
16:45	229	22	29	280
	929	78	100	1107
17:00	242	26	7	275
17:15	252	21	18	291
17:30	267	18	27	312
17:45	243	22	25	290
	1004	87	77	1168
18:00	237	19	16	272
18:15	221	14	18	253
18:30	191	17	16	224
18:45	185	16	20	221
	834	66	70	970
19:00	177	11	14	202
19:15	147	11	17	175
19:30	165	13	15	193
19:45	180	11	18	209
	669	46	64	779
20:00	161	7	12	180
20:15	161	7	23	191
20:30	122	7	11	140
20:45	109	8	14	131
	553	29	60	642
21:00	117	4	17	138
21:15	131	3	6	140
21:30	115	8	10	133
21:45	115	5	18	138
	478	20	51	549
22:00	114	0	6	120
22:15	101	6	11	118
22:30	137	1	7	145
22:45	177	7	13	197
	529	14	37	580
23:00	105	3	13	121
23:15	88	6	7	101
23:30	98	2	3	103
23:45	64	2	11	77
	355	13	34	402
Total	8747	766	994	10507
Percent	83.2%	7.3%	9.5%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Page 7

Site Code: 3

Station ID: 3

FULTON IND BLVD NORTH OF MENDEL DRIVE

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

SB

Start Time	Lights	Mediums	Trucks	Total
05/06/21	54	8	10	72
00:15	58	3	6	67
00:30	67	4	12	83
00:45	57	6	4	67
	236	21	32	289
01:00	54	3	11	68
01:15	42	4	3	49
01:30	35	2	8	45
01:45	40	6	6	52
	171	15	28	214
02:00	28	3	8	39
02:15	35	0	9	44
02:30	49	2	11	62
02:45	55	4	7	66
	167	9	35	211
03:00	35	3	7	45
03:15	59	3	8	70
03:30	49	9	4	62
03:45	68	2	11	81
	211	17	30	258
04:00	55	3	9	67
04:15	74	3	9	86
04:30	94	6	5	105
04:45	131	8	7	146
	354	20	30	404
05:00	104	8	12	124
05:15	119	6	9	134
05:30	205	11	19	235
05:45	288	8	12	308
	716	33	52	801
06:00	216	11	13	240
06:15	242	11	19	272
06:30	331	21	14	366
06:45	440	14	22	476
	1229	57	68	1354
07:00	304	16	23	343
07:15	248	26	24	298
07:30	273	26	24	323
07:45	292	27	21	340
	1117	95	92	1304
08:00	305	11	30	346
08:15	257	23	23	303
08:30	218	18	20	256
08:45	273	29	34	336
	1053	81	107	1241
09:00	250	18	36	304
09:15	174	25	32	231
09:30	207	46	40	293
09:45	213	45	38	296
	844	134	146	1124
10:00	177	33	40	250
10:15	162	30	49	241
10:30	200	26	47	273
10:45	167	21	34	222
	706	110	170	986
11:00	149	18	33	200
11:15	171	27	39	237
11:30	170	28	28	226
11:45	193	37	35	265
	683	110	135	928
Total	7487	702	925	9114
Percent	82.1%	7.7%	10.1%	100.0%

All Traffic Data Services

www.alltrafficdata.net

Site Code: 3

Station ID: 3

FULTON IND BLVD NORTH OF MENDEL DRIVE

Latitude: 0' 0.0000 Undefined

Longitude: 0' 0.0000 Undefined

SB

Start Time	Lights	Mediums	Trucks	Total
12 PM	195	36	42	273
12:15	220	26	30	276
12:30	198	21	24	243
12:45	231	24	31	286
	844	107	127	1078
13:00	211	33	45	289
13:15	223	23	36	282
13:30	263	39	29	331
13:45	247	33	48	328
	944	128	158	1230
14:00	227	31	28	286
14:15	244	31	36	311
14:30	220	24	29	273
14:45	253	22	38	313
	944	108	131	1183
15:00	207	17	30	254
15:15	199	22	29	250
15:30	236	32	24	292
15:45	201	16	23	240
	843	87	106	1036
16:00	237	26	24	287
16:15	260	23	16	299
16:30	265	24	25	314
16:45	232	25	29	286
	994	98	94	1186
17:00	228	21	21	270
17:15	261	27	20	308
17:30	242	16	24	282
17:45	207	13	21	241
	938	77	86	1101
18:00	238	13	22	273
18:15	269	15	16	300
18:30	191	10	30	231
18:45	177	18	10	205
	875	56	78	1009
19:00	187	17	15	219
19:15	184	11	18	213
19:30	186	12	15	213
19:45	189	13	19	221
	746	53	67	866
20:00	300	12	31	343
20:15	200	8	17	225
20:30	167	10	14	191
20:45	165	3	10	178
	832	33	72	937
21:00	110	4	6	120
21:15	123	8	8	139
21:30	123	2	15	140
21:45	123	7	10	140
	479	21	39	539
22:00	104	5	5	114
22:15	140	3	7	150
22:30	132	8	10	150
22:45	155	7	15	177
	531	23	37	591
23:00	99	4	11	114
23:15	82	7	11	100
23:30	81	1	7	89
23:45	86	4	10	100
	348	16	39	403
Total	9318	807	1034	11159
Percent	83.5%	7.2%	9.3%	100.0%
Grand Total	33181	2945	3886	40012
Percent	82.9%	7.4%	9.7%	100.0%

Turning Movement Counts (All Traffic Data)



(303) 216-2439
www.alltrafficdata.net

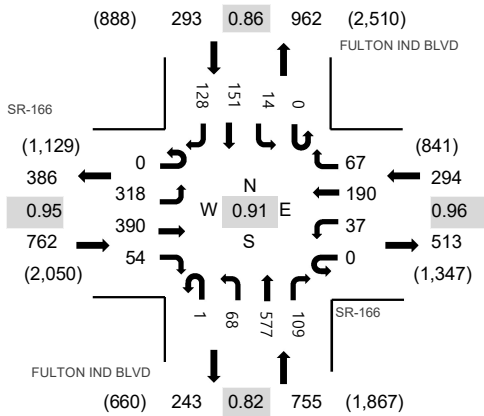
Location: #1 FULTON IND BLVD & SR-166 AM

Date: Wednesday, May 5, 2021

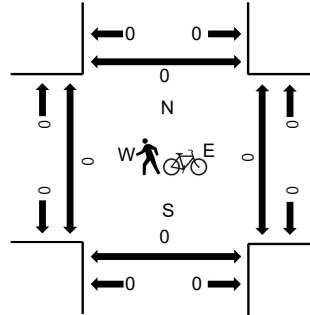
Peak Hour: 07:15 AM - 08:15 AM

Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	SR-166 Eastbound				SR-166 Westbound				FULTON IND BLVD Northbound				FULTON IND BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
6:30 AM	0	97	105	8	0	5	38	15	0	7	117	18	0	1	13	24	448	1,939	0	0	0	0
6:45 AM	0	119	90	6	0	5	44	19	0	15	143	16	0	2	35	36	530	2,072	0	0	0	0
7:00 AM	0	78	94	13	0	4	37	15	0	14	125	17	0	8	35	39	479	2,094	0	0	0	0
7:15 AM	0	81	111	12	0	7	44	12	0	14	118	20	0	3	32	28	482	2,104	0	0	0	0
7:30 AM	0	76	94	20	0	8	46	26	0	24	179	28	0	4	36	40	581	2,090	0	0	0	0
7:45 AM	0	102	100	12	0	12	44	15	1	18	148	27	0	4	35	34	552	1,969	0	0	0	0
8:00 AM	0	59	85	10	0	10	56	14	0	12	132	34	0	3	48	26	489	1,795	0	0	0	0
8:15 AM	0	99	85	8	0	16	49	11	0	12	86	25	0	10	37	30	468	1,699	0	0	0	0
8:30 AM	0	63	77	9	0	14	29	10	0	12	150	27	0	1	47	21	460	1,617	0	0	0	0
8:45 AM	0	53	69	2	0	10	51	17	0	11	82	8	0	12	35	28	378		0	0	0	0
9:00 AM	0	42	64	4	0	10	66	6	0	20	83	11	0	4	43	40	393		0	0	0	0
9:15 AM	0	27	66	10	0	4	65	7	0	12	84	17	0	7	44	43	386		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	6	7	2	0	0	5	5	0	0	17	0	0	3	17	7	69
Lights	0	310	369	49	0	36	177	58	1	68	547	106	0	9	120	115	1,965
Mediums	0	2	14	3	0	1	8	4	0	0	13	3	0	2	14	6	70
Total	0	318	390	54	0	37	190	67	1	68	577	109	0	14	151	128	2,104



(303) 216-2439
www.alltrafficdata.net

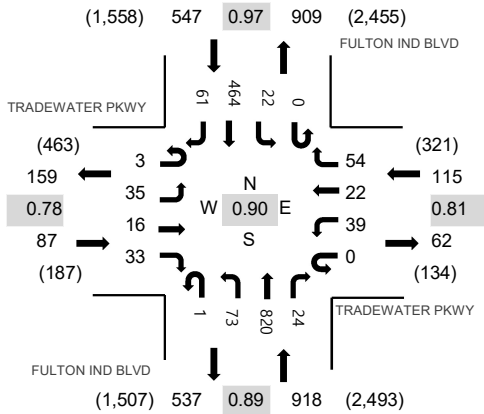
Location: #2 FULTON IND BLVD & TRADEWATER PKWY AM

Date: Wednesday, May 5, 2021

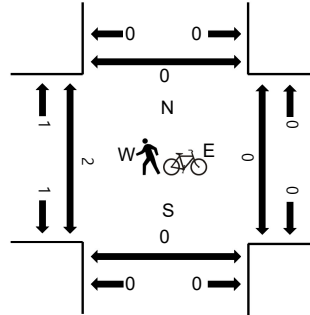
Peak Hour: 07:30 AM - 08:30 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	TRADEWATER PKWY Eastbound				TRADEWATER PKWY Westbound				FULTON IND BLVD Northbound				FULTON IND BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
6:30 AM	1	4	0	1	0	7	15	7	0	31	181	1	0	2	74	11	335	1,541	0	0	0	0
6:45 AM	0	10	1	6	0	10	18	11	0	49	207	2	0	6	133	14	467	1,641	0	0	0	0
7:00 AM	2	6	1	5	0	12	10	10	0	21	172	3	1	4	119	15	381	1,637	1	0	0	0
7:15 AM	0	8	2	5	0	4	12	9	0	14	193	3	1	4	87	16	358	1,650	2	0	0	0
7:30 AM	0	16	9	6	0	12	6	12	0	18	221	5	0	7	109	14	435	1,667	0	0	0	0
7:45 AM	2	12	4	13	0	13	7	15	1	36	216	4	0	2	116	22	463	1,606	0	0	0	0
8:00 AM	0	5	3	12	0	5	6	14	0	14	184	10	0	5	116	20	394	1,477	0	0	0	0
8:15 AM	1	2	0	2	0	9	3	13	0	5	199	5	0	8	123	5	375	1,395	2	0	0	0
8:30 AM	0	2	0	8	0	7	2	11	3	2	212	7	3	3	108	6	374	1,351	0	0	0	0
8:45 AM	0	7	0	3	0	10	1	12	1	9	167	4	4	3	107	6	334		0	0	0	0
9:00 AM	1	11	3	1	0	5	3	7	0	5	132	4	3	9	117	11	312		3	0	0	0
9:15 AM	0	7	2	3	0	10	6	7	0	9	140	3	1	5	124	14	331		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	9	0	5	0	0	0	1	0	6	54	2	0	0	52	11	140
Lights	3	23	16	19	0	36	22	52	1	66	720	19	0	22	372	46	1,417
Mediums	0	3	0	9	0	3	0	1	0	1	46	3	0	0	40	4	110
Total	3	35	16	33	0	39	22	54	1	73	820	24	0	22	464	61	1,667

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	22	0	1	0	1	0	2	0	2	80	0	1	2	93	14	218
Lights	0	10	0	1	0	1	0	15	1	11	810	6	7	14	881	16	1,773
Mediums	0	9	0	0	0	0	0	1	0	2	56	0	1	0	46	1	116
Total	0	41	0	2	0	2	0	18	1	15	946	6	9	16	1,020	31	2,107



(303) 216-2439
www.alltrafficdata.net

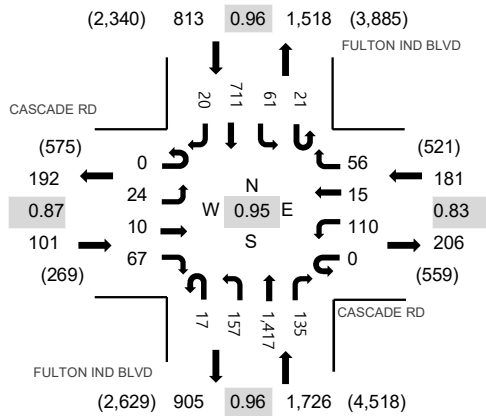
Location: #4 FULTON IND BLVD & CASCADE RD AM

Date: Wednesday, May 5, 2021

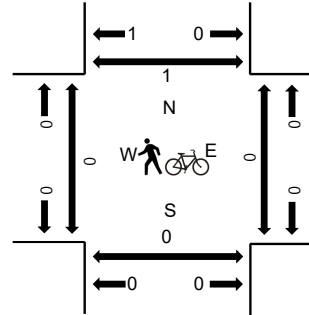
Peak Hour: 07:15 AM - 08:15 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	CASCADE RD Eastbound				CASCADE RD Westbound				FULTON IND BLVD Northbound				FULTON IND BLVD Southbound				Total	Rolling Pedestrian Crossings				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		Hour	West	East	South	North
6:30 AM	0	6	0	16	0	21	5	9	3	60	267	32	6	16	127	4	572	2,601	0	0	0	0
6:45 AM	0	4	0	10	0	32	4	4	5	62	305	31	5	19	201	8	690	2,748	0	0	0	0
7:00 AM	0	6	1	24	0	28	3	11	4	49	331	28	4	9	158	4	660	2,802	0	0	0	0
7:15 AM	0	12	3	14	0	23	4	15	5	42	358	27	3	11	155	7	679	2,821	0	0	0	0
7:30 AM	0	0	4	24	0	32	4	13	7	46	360	33	6	19	168	3	719	2,808	0	0	0	0
7:45 AM	0	5	2	13	0	33	4	15	1	41	372	40	5	19	188	6	744	2,673	0	0	0	0
8:00 AM	0	7	1	16	0	22	3	13	4	28	327	35	7	12	200	4	679	2,513	0	0	0	1
8:15 AM	0	3	1	8	0	43	2	15	2	32	314	26	4	14	201	1	666	2,359	0	0	0	2
8:30 AM	0	4	2	18	0	24	3	12	5	33	280	33	4	13	148	5	584	2,239	0	2	0	1
8:45 AM	0	3	0	12	0	24	2	6	10	32	279	28	6	15	161	6	584		1	0	1	0
9:00 AM	0	6	4	15	0	30	6	11	4	30	218	32	8	13	145	3	525		0	0	0	0
9:15 AM	0	7	3	15	0	31	2	12	5	19	210	23	7	10	194	8	546		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	1	0	6	0	2	0	0	0	13	79	2	0	0	73	2	178
Lights	0	21	9	48	0	96	15	53	17	139	1,266	130	21	56	587	18	2,476
Mediums	0	2	1	13	0	12	0	3	0	5	72	3	0	5	51	0	167
Total	0	24	10	67	0	110	15	56	17	157	1,417	135	21	61	711	20	2,821



(303) 216-2439
www.alltrafficdata.net

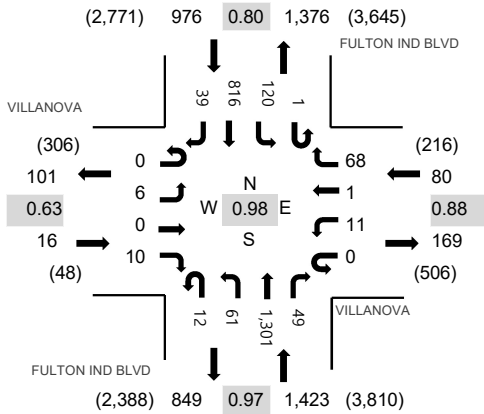
Location: #5 FULTON IND BLVD & VILLANOVA AM

Date: Wednesday, May 5, 2021

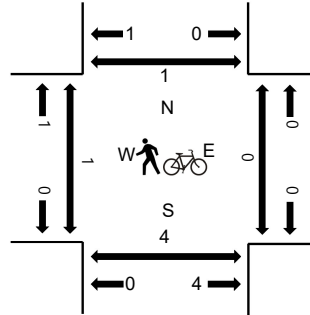
Peak Hour: 07:30 AM - 08:30 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	VILLANOVA Eastbound			VILLANOVA Westbound			FULTON IND BLVD Northbound			FULTON IND BLVD Southbound			Rolling Pedestrian Crossings			
	U-Turn	Left	Thru Right	U-Turn	Left	Thru Right	U-Turn	Left	Thru Right	U-Turn	Left	Thru Right	Total	Hour	West	East South North
6:30 AM	0	1	0 2	0	2	0 12	2	19	255 10	0	28	150 6	487	2,327	0	0 0 0
6:45 AM	0	1	0 2	0	3	0 12	2	38	251 13	1	51	238 19	631	2,476	0	0 0 0
7:00 AM	0	2	0 2	0	1	0 16	0	12	330 10	0	42	181 15	611	2,484	0	0 1 0
7:15 AM	0	1	0 2	0	2	0 23	2	18	337 12	0	19	167 15	598	2,491	0	0 2 0
7:30 AM	0	2	0 0	0	2	0 21	3	18	337 8	0	29	208 8	636	2,495	1	0 3 0
7:45 AM	0	2	0 3	0	1	1 15	5	15	346 12	0	37	192 10	639	2,364	0	0 1 0
8:00 AM	0	2	0 3	0	6	0 17	2	16	322 12	1	26	205 6	618	2,259	0	0 0 0
8:15 AM	0	0	0 4	0	2	0 15	2	12	296 17	0	28	211 15	602	2,149	0	0 0 1
8:30 AM	0	0	0 5	0	3	0 7	4	11	272 13	0	25	163 2	505	2,023	0	0 0 0
8:45 AM	0	1	0 2	0	3	0 16	4	5	271 10	0	23	188 11	534		0	0 0 0
9:00 AM	0	2	0 6	0	5	0 14	6	9	225 21	0	21	184 15	508		0	0 0 0
9:15 AM	0	1	0 2	0	3	0 14	5	3	204 13	0	26	198 7	476		0	0 0 0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound			Westbound			Northbound			Southbound			Total
	U-Turn	Left	Thru Right	U-Turn	Left	Thru Right	U-Turn	Left	Thru Right	U-Turn	Left	Thru Right	
Articulated Trucks	0	0	0 3	0	2	0 6	1	1	79 5	0	4	81 8	190
Lights	0	5	0 4	0	9	1 48	10	59	1,145 44	1	109	686 28	2,149
Mediums	0	1	0 3	0	0	0 14	1	1	77 0	0	7	49 3	156
Total	0	6	0 10	0	11	1 68	12	61	1,301 49	1	120	816 39	2,495



(303) 216-2439
www.alltrafficdata.net

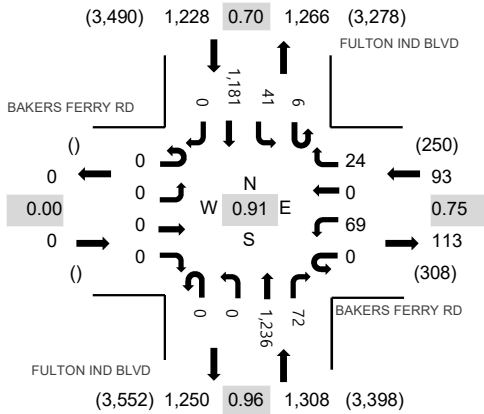
Location: #6 FULTON IND BLVD & BAKERS FERRY RD AM

Date: Wednesday, May 5, 2021

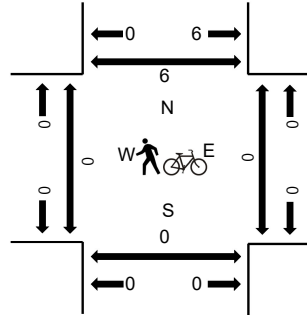
Peak Hour: 07:15 AM - 08:15 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	BAKERS FERRY RD				BAKERS FERRY RD				FULTON IND BLVD				FULTON IND BLVD				Total	Rolling Hour	Pedestrian Crossings			
	Eastbound				Westbound				Northbound				Southbound						West	East	South	North
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right						
6:30 AM	0	0	0	0	0	13	0	3	0	0	217	13	0	10	274	0	530	2,443	0	0	0	2
6:45 AM	0	0	0	0	0	31	0	4	0	0	185	19	1	16	436	0	692	2,552	0	0	0	2
7:00 AM	0	0	0	0	0	13	0	6	1	0	289	25	0	11	240	0	585	2,584	0	0	0	0
7:15 AM	0	0	0	0	0	16	0	10	0	0	316	22	0	7	265	0	636	2,629	0	0	0	3
7:30 AM	0	0	0	0	0	21	0	4	0	0	313	13	2	11	275	0	639	2,566	0	0	0	2
7:45 AM	0	0	0	0	0	17	0	8	0	0	329	17	1	12	340	0	724	2,494	0	0	0	0
8:00 AM	0	0	0	0	0	15	0	2	0	0	278	20	3	11	301	0	630	2,308	0	0	0	1
8:15 AM	0	0	0	0	0	18	0	7	0	0	287	20	1	14	226	0	573	2,195	0	0	0	1
8:30 AM	0	0	0	0	0	11	0	6	0	0	276	12	0	6	256	0	567	2,129	0	0	0	1
8:45 AM	0	0	0	0	0	13	0	6	0	0	264	16	0	7	232	0	538		0	0	0	0
9:00 AM	0	0	0	0	0	11	0	1	1	0	240	7	1	4	252	0	517		0	0	0	0
9:15 AM	0	0	0	0	0	7	0	7	0	0	210	8	1	7	267	0	507		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	6	0	3	0	0	88	2	0	3	106	0	208
Lights	0	0	0	0	0	59	0	21	0	0	1,037	68	6	35	997	0	2,223
Mediums	0	0	0	0	0	4	0	0	0	0	111	2	0	3	78	0	198
Total	0	0	0	0	0	69	0	24	0	0	1,236	72	6	41	1,181	0	2,629



(303) 216-2439
www.alltrafficdata.net

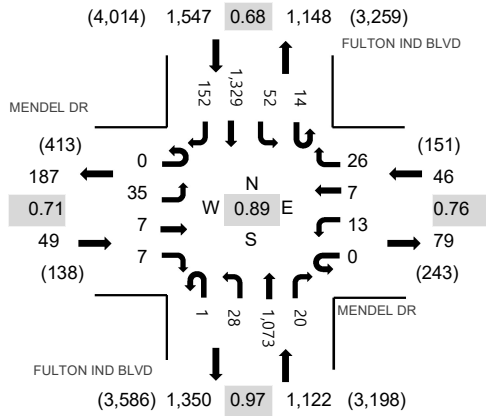
Location: #7 FULTON IND BLVD & MENDEL DR AM

Date: Wednesday, May 5, 2021

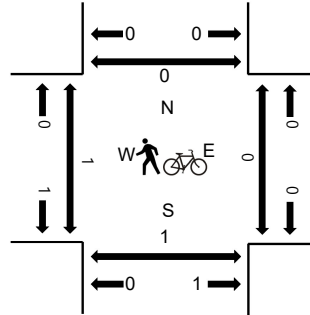
Peak Hour: 06:45 AM - 07:45 AM

Peak 15-Minutes: 06:45 AM - 07:00 AM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	MENDEL DR Eastbound				MENDEL DR Westbound				FULTON IND BLVD Northbound				FULTON IND BLVD Southbound				Total	Rolling Pedestrian Crossings				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		Hour	West	East	South	North
6:30 AM	0	12	0	2	0	1	1	4	0	7	184	3	0	9	281	26	530	2,575	0	0	0	0
6:45 AM	0	14	3	1	0	5	1	6	0	12	165	2	3	12	475	76	775	2,764	0	0	0	0
7:00 AM	0	11	2	0	0	4	5	4	1	9	289	4	7	9	263	29	637	2,667	0	0	0	0
7:15 AM	0	4	0	2	0	0	0	11	0	4	307	5	2	11	260	27	633	2,719	0	0	1	0
7:30 AM	0	6	2	4	0	4	1	5	0	3	312	9	2	20	331	20	719	2,684	0	0	0	0
7:45 AM	0	5	0	2	0	3	0	8	1	3	301	11	1	12	309	22	678	2,521	0	0	0	3
8:00 AM	0	14	1	0	0	13	0	8	1	7	264	11	2	19	325	24	689	2,415	0	0	0	0
8:15 AM	0	8	0	3	0	4	0	8	0	8	279	3	2	12	247	24	598	2,295	0	0	0	0
8:30 AM	0	5	0	1	0	3	1	7	1	9	254	8	6	9	236	16	556	2,242	0	0	0	0
8:45 AM	0	5	0	2	0	6	3	11	0	6	245	9	2	10	245	28	572		0	0	0	0
9:00 AM	0	12	0	2	0	2	2	7	0	4	231	9	3	9	270	18	569		0	0	0	0
9:15 AM	0	8	1	6	0	5	0	8	1	3	203	10	4	18	264	14	545		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	2	0	0	0	2	0	5	0	1	71	1	2	5	90	5	184
Lights	0	25	7	6	0	9	7	16	1	26	921	17	11	40	1,167	142	2,395
Mediums	0	8	0	1	0	2	0	5	0	1	81	2	1	7	72	5	185
Total	0	35	7	7	0	13	7	26	1	28	1,073	20	14	52	1,329	152	2,764



(303) 216-2439
www.alltrafficdata.net

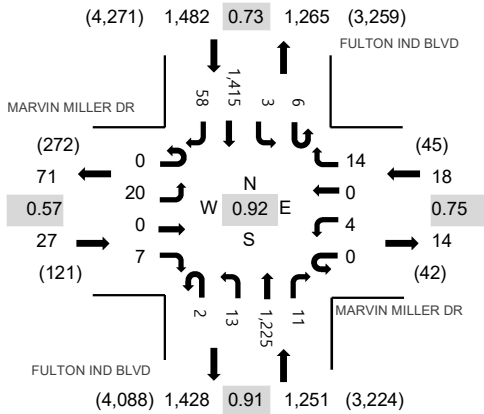
Location: #8 FULTON IND BLVD & MARVIN MILLER DR AM

Date: Wednesday, May 5, 2021

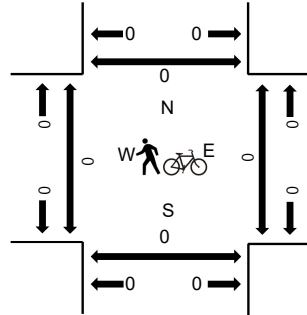
Peak Hour: 07:15 AM - 08:15 AM

Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	MARVIN MILLER DR Eastbound				MARVIN MILLER DR Westbound				FULTON IND BLVD Northbound				FULTON IND BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
6:30 AM	0	1	0	1	0	0	0	4	2	0	184	2	0	5	341	7	547	2,562	0	0	0	0
6:45 AM	0	1	0	0	0	2	0	0	0	2	189	1	0	0	540	8	743	2,769	0	0	0	0
7:00 AM	0	0	0	1	0	0	0	3	3	0	296	2	0	0	323	5	633	2,735	0	0	0	0
7:15 AM	0	1	0	1	0	1	0	3	1	1	305	1	1	2	313	9	639	2,778	0	0	0	0
7:30 AM	0	2	0	2	0	2	0	4	1	3	338	4	0	1	384	13	754	2,749	0	0	0	0
7:45 AM	0	4	0	0	0	0	0	3	0	3	301	1	1	0	377	19	709	2,567	0	0	0	0
8:00 AM	0	13	0	4	0	1	0	4	0	6	281	5	4	0	341	17	676	2,464	0	0	0	0
8:15 AM	0	4	0	2	0	1	0	1	0	12	286	2	1	1	286	14	610	2,394	0	0	0	0
8:30 AM	0	6	0	2	0	1	0	2	0	5	254	2	1	0	272	27	572	2,350	0	0	0	0
8:45 AM	0	9	0	5	0	1	0	2	1	11	246	2	0	2	285	42	606		0	0	0	0
9:00 AM	0	20	0	5	0	0	0	6	1	12	220	5	2	0	291	44	606		0	0	0	0
9:15 AM	0	24	0	13	0	0	0	4	2	5	225	1	3	3	279	7	566		0	1	0	1

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	2	0	3	1	1	97	1	0	1	120	1	227
Lights	0	19	0	5	0	0	0	4	1	11	1,016	3	6	0	1,207	53	2,325
Mediums	0	1	0	2	0	2	0	7	0	1	112	7	0	2	88	4	226
Total	0	20	0	7	0	4	0	14	2	13	1,225	11	6	3	1,415	58	2,778



(303) 216-2439
www.alltrafficdata.net

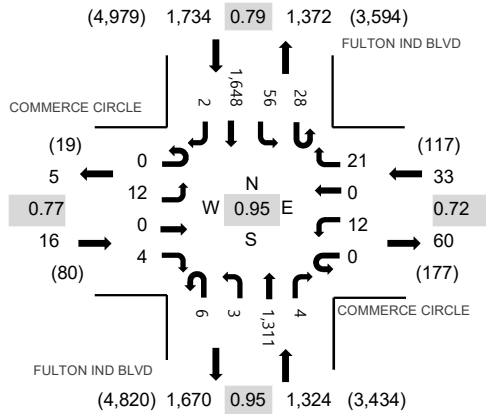
Location: #9 FULTON IND BLVD & COMMERCE CIRCLE AM

Date: Wednesday, May 5, 2021

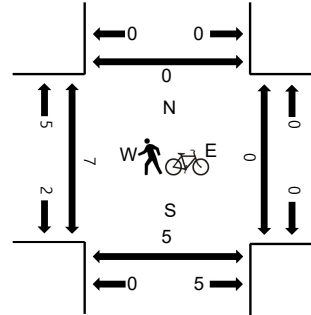
Peak Hour: 07:15 AM - 08:15 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	COMMERCE CIRCLE				COMMERCE CIRCLE				FULTON IND BLVD				FULTON IND BLVD				Total	Rolling Hour	Pedestrian Crossings				
	Eastbound				Westbound				Northbound				Southbound						West	East	South	North	
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right							
6:30 AM	0	7	0	0	0	3	1	6	1	0	194	2	4	6	471	0	695	2,972	0	0	0	0	
6:45 AM	0	3	2	1	0	3	0	9	0	0	205	1	2	18	572	0	816	3,054	1	1	3	0	
7:00 AM	0	4	0	2	0	3	1	11	2	0	307	1	3	5	362	0	701	3,059	1	0	0	1	
7:15 AM	0	3	0	0	0	1	0	4	3	0	328	0	9	13	399	0	760	3,107	0	0	0	0	
7:30 AM	0	6	0	2	0	4	0	3	0	3	345	2	4	9	398	1	777	3,010	3	0	2	0	
7:45 AM	0	3	0	2	0	1	0	5	2	0	324	2	7	19	456	0	821	2,932	1	0	1	0	
8:00 AM	0	0	0	0	0	6	0	9	1	0	314	0	8	15	395	1	749	2,762	3	0	2	0	
8:15 AM	0	7	1	0	0	4	0	11	2	0	303	2	3	18	310	2	663	2,654	0	1	2	0	
8:30 AM	0	8	0	4	0	1	1	3	2	0	287	0	7	17	368	1	699	2,628	0	0	1	0	
8:45 AM	0	9	0	0	0	0	0	6	3	0	276	0	4	13	339	1	651		1	0	2	0	
9:00 AM	0	5	1	1	0	5	0	5	2	0	252	3	4	16	347	0	641		3	1	1	0	
9:15 AM	0	7	0	2	0	8	0	3	4	2	258	1	9	10	328	5	637		1	0	1	0	

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	1	0	0	0	0	110	0	0	1	134	0	246
Lights	0	11	0	4	0	10	0	19	6	3	1,050	4	27	53	1,425	2	2,614
Mediums	0	1	0	0	0	1	0	2	0	0	151	0	1	2	89	0	247
Total	0	12	0	4	0	12	0	21	6	3	1,311	4	28	56	1,648	2	3,107



ALL TRAFFIC DATA SERVICES

(303) 216-2439

www.alltrafficdata.net

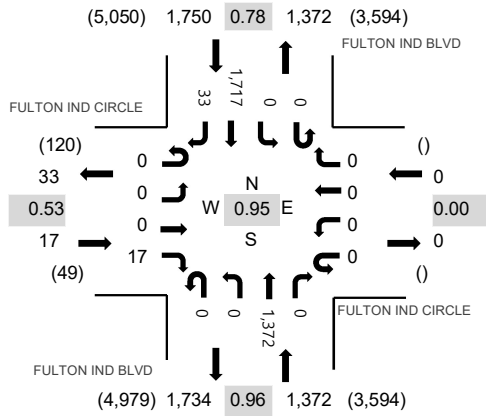
Location: #10 FULTON IND BLVD & FULTON IND CIRCLE AM

Date: Wednesday, May 5, 2021

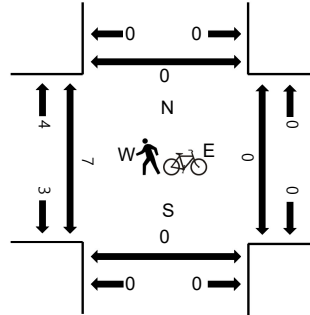
Peak Hour: 07:15 AM - 08:15 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	FULTON IND CIRCLE				FULTON IND CIRCLE				FULTON IND BLVD				FULTON IND BLVD				Rolling		Pedestrian Crossings			
	Eastbound				Westbound				Northbound				Southbound									
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	Hour	West	East	South	North
6:30 AM	0	0	0	4	0	0	0	0	0	0	211	0	0	0	477	15	707	3,008	0	0	0	1
6:45 AM	0	0	0	1	0	0	0	0	0	0	219	0	0	0	591	14	825	3,080	1	1	0	0
7:00 AM	0	0	0	3	0	0	0	0	0	0	325	0	0	0	367	9	704	3,083	1	1	1	0
7:15 AM	0	0	0	7	0	0	0	0	0	0	344	0	0	0	414	7	772	3,139	1	0	0	0
7:30 AM	0	0	0	4	0	0	0	0	0	0	358	0	0	0	408	9	779	3,029	3	0	0	0
7:45 AM	0	0	0	4	0	0	0	0	0	0	339	0	0	0	478	7	828	2,957	0	0	0	0
8:00 AM	0	0	0	2	0	0	0	0	0	0	331	0	0	0	417	10	760	2,793	3	0	0	0
8:15 AM	0	0	0	5	0	0	0	0	0	0	324	0	0	0	328	5	662	2,673	0	1	0	0
8:30 AM	0	0	0	5	0	0	0	0	0	0	305	0	0	0	388	9	707	2,656	0	0	0	0
8:45 AM	0	0	0	3	0	0	0	0	0	0	295	0	0	0	354	12	664		0	1	0	0
9:00 AM	0	0	0	2	0	0	0	0	0	0	266	0	0	0	365	7	640		2	1	0	0
9:15 AM	0	0	0	9	0	0	0	0	0	0	277	0	0	0	343	16	645		0	1	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	110	0	0	0	135	0	245
Lights	0	0	0	17	0	0	0	0	0	0	1,107	0	0	0	1,490	32	2,646
Mediums	0	0	0	0	0	0	0	0	0	0	155	0	0	0	92	1	248
Total	0	0	0	17	0	0	0	0	0	0	1,372	0	0	0	1,717	33	3,139

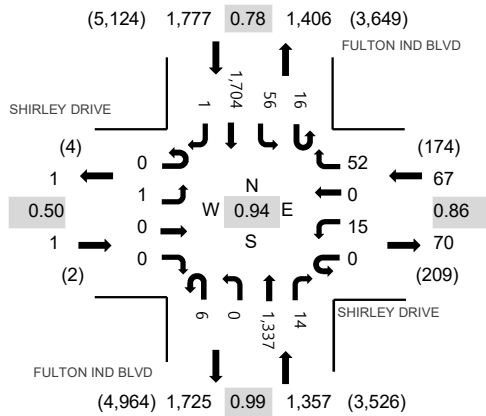
Location: #11 FULTON IND BLVD & SHIRLEY DRIVE AM

Date: Wednesday, May 5, 2021

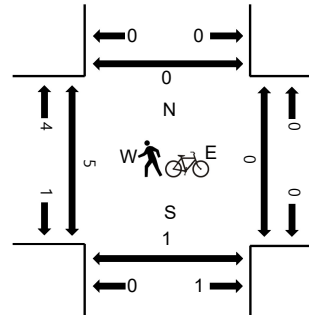
Peak Hour: 07:15 AM - 08:15 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	SHIRLEY DRIVE Eastbound				SHIRLEY DRIVE Westbound				FULTON IND BLVD Northbound				FULTON IND BLVD Southbound				Rolling Pedestrian Crossings			
	U-Turn Left Thru Right				U-Turn Left Thru Right				U-Turn Left Thru Right				U-Turn Left Thru Right				Hour West East South North			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	Hour	West	East
6:30 AM	0	0	0	0	0	3	0	8	0	0	197	4	0	14	480	1	707	3,036	1	0
6:45 AM	0	0	0	0	0	8	0	10	0	0	215	5	2	35	578	0	853	3,123	0	0
7:00 AM	0	1	0	0	0	2	0	10	0	0	300	1	1	14	370	1	700	3,125	0	0
7:15 AM	0	0	0	0	0	5	0	15	2	0	327	8	2	13	404	0	776	3,202	0	0
7:30 AM	0	0	0	0	0	5	0	14	0	0	337	2	6	11	419	0	794	3,119	3	0
7:45 AM	0	1	0	0	0	3	0	10	1	0	340	1	2	17	479	1	855	3,038	0	0
8:00 AM	0	0	0	0	0	2	0	13	3	0	333	3	6	15	402	0	777	2,836	2	0
8:15 AM	0	0	0	0	0	2	0	12	1	0	315	2	3	10	348	0	693	2,721	2	3
8:30 AM	0	0	0	0	0	3	0	12	0	0	298	4	3	13	380	0	713	2,671	0	0
8:45 AM	0	0	0	0	0	0	0	8	0	0	286	1	3	15	340	0	653		0	0
9:00 AM	0	0	0	0	0	3	0	15	1	0	263	3	2	10	365	0	662		1	0
9:15 AM	0	0	0	0	0	4	0	7	2	1	270	0	2	8	349	0	643		0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	8	0	0	109	0	0	3	129	0	249
Lights	0	0	0	0	0	15	0	36	6	0	1,078	11	9	52	1,481	0	2,688
Mediums	0	1	0	0	0	0	0	8	0	0	150	3	7	1	94	1	265
Total	0	1	0	0	0	15	0	52	6	0	1,337	14	16	56	1,704	1	3,202

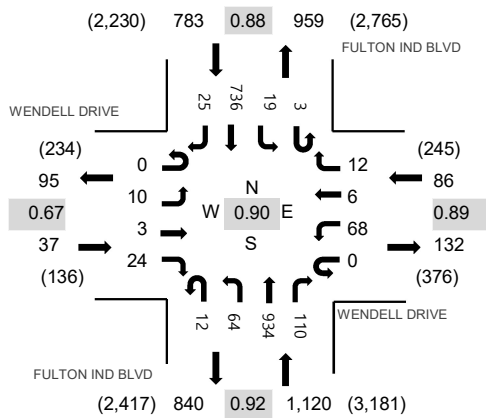
Location: #12 FULTON IND BLVD & WENDELL DRIVE AM

Date: Wednesday, May 5, 2021

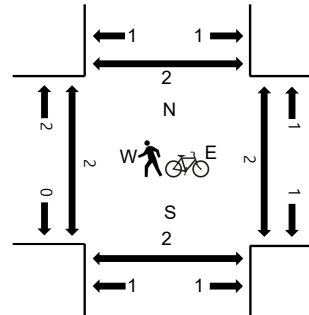
Peak Hour: 07:15 AM - 08:15 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WENDELL DRIVE				WENDELL DRIVE				FULTON IND BLVD				FULTON IND BLVD				Rolling Pedestrian Crossings							
	Eastbound				Westbound				Northbound				Southbound											
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	Hour	West	East	South	North		
6:30 AM	0	3	6	6	0	12	4	3	0	7	190	23	0	7	193	1	455	1,873	0	0	0	3		
6:45 AM	0	5	4	3	0	17	6	2	3	25	206	20	0	5	200	7	503	1,933	0	3	0	0		
7:00 AM	0	1	3	9	0	14	4	2	2	19	189	29	0	9	135	6	422	1,990	0	0	0	2		
7:15 AM	0	1	0	5	0	15	0	2	5	21	216	33	1	3	184	7	493	2,026	0	0	0	0		
7:30 AM	0	1	3	6	0	21	1	1	2	14	249	31	0	6	171	9	515	2,020	0	0	0	2		
7:45 AM	0	4	0	6	0	15	3	2	1	19	262	25	2	6	209	6	560	1,995	2	0	1	0		
8:00 AM	0	4	0	7	0	17	2	7	4	10	207	21	0	4	172	3	458	1,937	0	2	1	0		
8:15 AM	0	1	2	8	0	16	2	6	6	10	242	24	0	4	164	2	487	1,928	1	3	0	0		
8:30 AM	0	3	3	7	0	16	0	1	7	8	237	20	0	1	184	3	490	1,899	1	1	0	0		
8:45 AM	0	2	1	10	0	12	0	0	4	9	271	23	1	5	162	2	502		2	0	3	0		
9:00 AM	0	2	1	1	0	9	1	2	4	8	215	24	0	4	174	4	449		0	0	2	0		
9:15 AM	0	2	6	10	0	21	2	7	1	5	213	17	0	3	167	4	458		0	0	1	0		

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	3	0	0	0	1	42	1	0	0	34	0	81
Lights	0	10	3	21	0	57	5	12	12	56	842	103	3	19	651	23	1,817
Mediums	0	0	0	3	0	8	1	0	0	7	50	6	0	0	51	2	128
Total	0	10	3	24	0	68	6	12	12	64	934	110	3	19	736	25	2,026

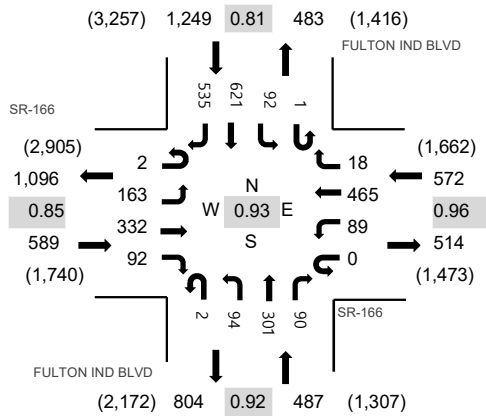
Location: #1 FULTON IND BLVD & SR-166 PM

Date: Wednesday, May 5, 2021

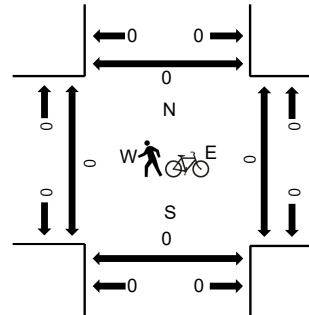
Peak Hour: 05:00 PM - 06:00 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	SR-166 Eastbound				SR-166 Westbound				FULTON IND BLVD Northbound				FULTON IND BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	43	98	13	0	23	107	5	0	20	60	20	0	26	97	119	631	2,544	0	0	0	0
3:45 PM	1	56	83	16	0	34	91	5	1	11	71	25	0	23	119	88	624	2,594	0	0	0	0
4:00 PM	0	39	89	26	0	24	122	7	0	28	62	23	1	25	102	110	658	2,623	0	0	0	0
4:15 PM	0	44	68	21	0	26	107	13	0	9	65	12	0	19	145	102	631	2,746	0	0	0	0
4:30 PM	0	38	78	18	0	24	108	9	0	16	71	11	0	20	149	139	681	2,834	0	0	0	0
4:45 PM	0	45	74	25	0	21	119	6	0	11	62	15	0	11	148	116	653	2,873	0	0	0	0
5:00 PM	1	43	55	21	0	18	106	4	1	14	94	21	0	28	197	178	781	2,897	0	0	0	0
5:15 PM	0	35	84	19	0	31	124	6	0	20	63	21	0	31	153	132	719	2,741	0	0	0	0
5:30 PM	1	36	90	23	0	15	109	5	1	29	79	24	0	19	161	128	720	2,588	0	0	0	0
5:45 PM	0	49	103	29	0	25	126	3	0	31	65	24	1	14	110	97	677		0	0	0	0
6:00 PM	0	53	79	13	0	30	83	4	0	26	64	30	1	16	138	88	625		0	0	0	0
6:15 PM	0	44	73	14	0	18	99	5	0	17	60	30	0	11	123	72	566		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	8	2	0	0	0	8	1	0	2	17	1	0	11	17	12	79
Lights	2	151	327	90	0	89	454	16	2	88	271	87	1	78	586	514	2,756
Mediums	0	4	3	2	0	0	3	1	0	4	13	2	0	3	18	9	62
Total	2	163	332	92	0	89	465	18	2	94	301	90	1	92	621	535	2,897

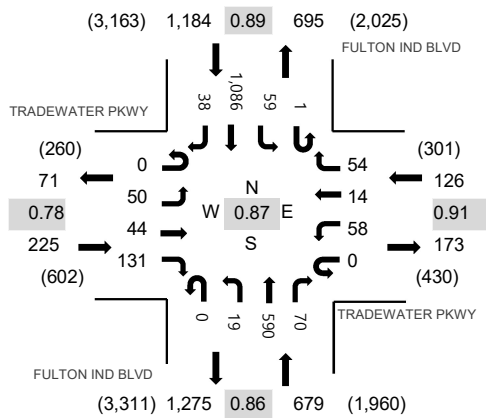
Location: #2 FULTON IND BLVD & TRADEWATER PKWY PM

Date: Wednesday, May 5, 2021

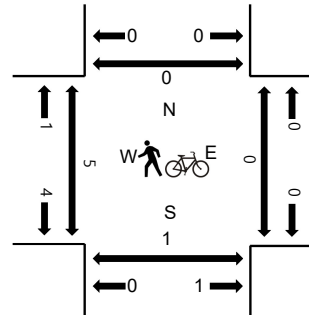
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	TRADEWATER PKWY Eastbound				TRADEWATER PKWY Westbound				FULTON IND BLVD Northbound				FULTON IND BLVD Southbound				Rolling Pedestrian Crossings			
	U-Turn		Thru		U-Turn		Thru		U-Turn		Thru		U-Turn		Thru		Total		Hour	
	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right			West	East
3:30 PM	0	14	15	40	0	2	3	20	0	8	177	20	1	8	190	32	530	1,960	0	0
3:45 PM	0	8	3	22	0	3	5	6	1	8	156	10	0	14	202	19	457	1,963	0	0
4:00 PM	0	18	8	35	0	8	0	10	0	6	149	12	1	9	213	14	483	2,000	1	0
4:15 PM	0	11	5	23	0	9	2	18	0	3	146	13	2	6	236	16	490	2,150	0	0
4:30 PM	0	15	16	30	0	9	4	13	0	7	138	16	1	18	256	10	533	2,214	2	0
4:45 PM	0	17	7	19	0	6	3	16	0	5	143	20	0	12	237	9	494	2,213	1	0
5:00 PM	0	7	11	54	0	19	5	14	0	2	174	14	0	15	308	10	633	2,186	1	0
5:15 PM	0	11	10	28	0	24	2	11	0	5	135	20	0	14	285	9	554	1,983	1	0
5:30 PM	0	13	14	34	0	21	3	10	0	5	146	14	0	18	242	12	532	1,852	0	0
5:45 PM	0	6	6	24	0	9	9	12	0	10	115	4	0	13	248	11	467		0	0
6:00 PM	0	14	10	21	0	2	2	14	0	2	117	14	0	13	212	9	430		0	0
6:15 PM	0	10	10	13	0	2	1	4	0	5	131	9	1	9	224	4	423		0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	11	0	11	0	2	1	1	0	6	50	1	0	1	52	9	145
Lights	0	37	44	114	0	54	13	52	0	11	517	69	1	58	1,003	23	1,996
Mediums	0	2	0	6	0	2	0	1	0	2	23	0	0	0	31	6	73
Total	0	50	44	131	0	58	14	54	0	19	590	70	1	59	1,086	38	2,214

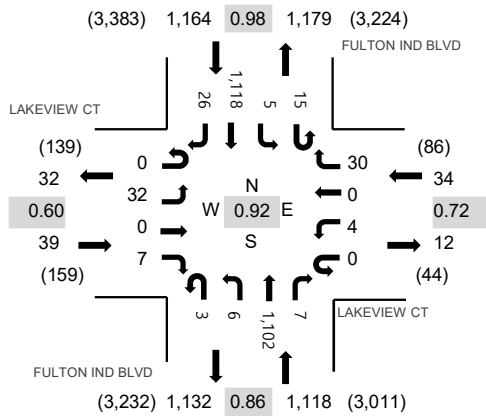
Location: #3 FULTON IND BLVD & LAKEVIEW CT PM

Date: Wednesday, May 5, 2021

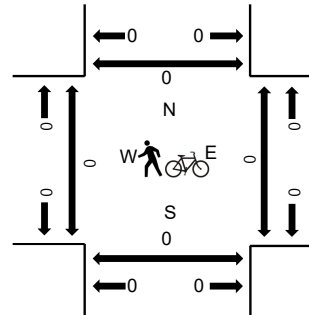
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	LAKEVIEW CT				LAKEVIEW CT				FULTON IND BLVD				FULTON IND BLVD				Total	Hour	Rolling Pedestrian Crossings			
	Eastbound				Westbound				Northbound				Southbound						West	East	South	North
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right						
3:30 PM	0	28	0	2	0	0	0	3	1	4	321	1	6	2	276	9	653	2,292	0	0	0	0
3:45 PM	0	10	0	7	0	0	0	8	0	3	258	1	4	5	242	13	551	2,235	0	0	0	0
4:00 PM	0	16	0	1	0	0	0	4	0	1	254	0	7	4	261	6	554	2,248	0	0	0	0
4:15 PM	0	6	0	2	0	1	0	12	0	1	228	4	1	3	264	12	534	2,336	1	0	0	0
4:30 PM	0	8	0	2	0	2	0	13	1	0	295	1	4	1	266	3	596	2,355	0	0	0	0
4:45 PM	0	10	0	0	0	0	0	10	0	2	250	3	2	2	278	7	564	2,310	0	0	0	0
5:00 PM	0	6	0	2	0	2	0	3	0	4	317	3	4	2	292	7	642	2,261	0	0	0	0
5:15 PM	0	8	0	3	0	0	0	4	2	0	240	0	5	0	282	9	553	2,099	0	0	0	0
5:30 PM	0	11	0	2	0	1	0	3	1	1	231	0	4	2	287	8	551	1,992	0	0	0	0
5:45 PM	0	11	0	2	0	1	0	4	0	4	193	1	5	2	272	20	515		0	0	0	0
6:00 PM	0	12	0	2	0	0	0	4	0	5	192	1	3	3	249	9	480		0	0	0	0
6:15 PM	0	7	0	1	0	0	0	11	0	2	184	1	4	2	225	9	446		0	1	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	7	0	2	0	0	0	2	0	3	86	0	1	1	74	19	195
Lights	0	21	0	5	0	3	0	28	3	2	974	7	12	3	991	6	2,055
Mediums	0	4	0	0	0	1	0	0	0	1	42	0	2	1	53	1	105
Total	0	32	0	7	0	4	0	30	3	6	1,102	7	15	5	1,118	26	2,355



(303) 216-2439
www.alltrafficdata.net

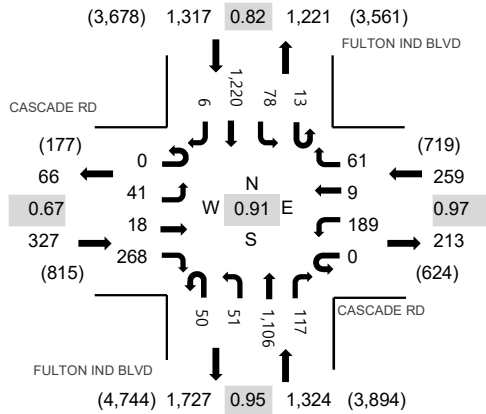
Location: #4 FULTON IND BLVD & CASCADE RD PM

Date: Wednesday, May 5, 2021

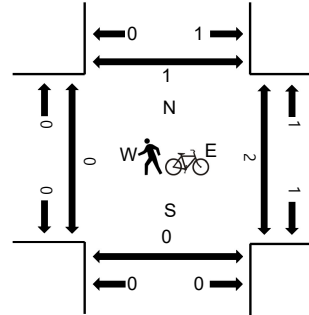
Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:00 PM - 04:15 PM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	CASCADE RD Eastbound				CASCADE RD Westbound				FULTON IND BLVD Northbound				FULTON IND BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North	
3:30 PM	0	7	4	62	0	57	0	12	15	8	308	30	2	16	312	0	833	3,175	0	0	0	0	
3:45 PM	0	6	7	51	0	42	3	29	18	10	268	29	2	21	245	4	735	3,203	0	0	0	0	
4:00 PM	0	14	4	76	0	58	1	11	12	8	273	31	5	20	378	0	891	3,227	0	1	0	0	
4:15 PM	0	8	4	42	0	50	4	20	15	15	248	22	2	23	262	1	716	3,163	0	1	0	0	
4:30 PM	0	15	9	104	0	48	1	9	14	14	300	32	3	19	290	3	861	3,187	0	0	0	1	
4:45 PM	0	4	1	46	0	33	3	21	9	14	285	32	3	16	290	2	759	3,074	0	0	0	0	
5:00 PM	0	12	8	89	0	39	2	10	19	12	272	34	5	16	306	3	827	2,991	0	0	0	0	
5:15 PM	0	7	7	35	0	40	2	14	14	10	293	21	1	19	275	2	740	2,876	0	0	0	0	
5:30 PM	0	11	7	67	0	38	1	15	16	9	256	29	3	16	278	2	748	2,744	0	0	0	3	
5:45 PM	0	1	3	35	0	40	1	10	10	14	260	15	1	31	254	1	676		0	0	0	2	
6:00 PM	0	6	5	27	0	50	4	14	11	11	276	29	1	19	257	2	712		0	2	0	1	
6:15 PM	0	2	4	25	0	27	2	8	12	8	226	27	2	14	251	0	608		0	0	0	0	

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	1	0	6	0	6	2	1	0	5	66	10	0	1	80	1	179
Lights	0	40	18	259	0	182	6	58	50	41	985	103	13	72	1,091	5	2,923
Mediums	0	0	0	3	0	1	1	2	0	5	55	4	0	5	49	0	125
Total	0	41	18	268	0	189	9	61	50	51	1,106	117	13	78	1,220	6	3,227



(303) 216-2439
www.alltrafficdata.net

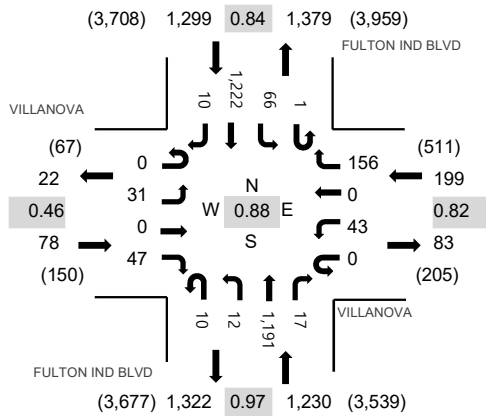
Location: #5 FULTON IND BLVD & VILLANOVA PM

Date: Wednesday, May 5, 2021

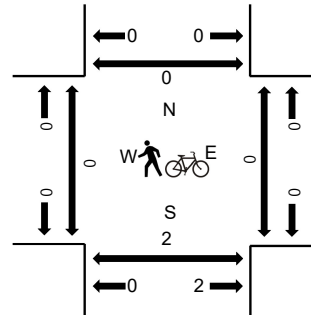
Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:00 PM - 04:15 PM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	VILLANOVA Eastbound			VILLANOVA Westbound			FULTON IND BLVD Northbound			FULTON IND BLVD Southbound			Rolling Pedestrian Crossings				
	U-Turn	Left	Thru Right	U-Turn	Left	Thru Right	U-Turn	Left	Thru Right	U-Turn	Left	Thru Right	Total	Hour	West	East	South North
3:30 PM	0	9	0 2	0	11	0 38	1	2	318	1	0	17 314	6	719	2,752	0	0 1 0
3:45 PM	0	7	0 2	0	4	0 27	2	5	285	6	0	16 258	3	615	2,749	1	0 0 1
4:00 PM	0	15	0 27	0	8	0 51	7	2	297	7	0	23 360	3	800	2,806	0	0 1 0
4:15 PM	0	2	0 5	0	5	0 31	2	5	266	4	0	13 282	3	618	2,710	0	0 0 0
4:30 PM	0	6	0 12	0	19	0 43	0	3	319	1	1	17 291	4	716	2,754	0	0 1 0
4:45 PM	0	8	0 3	0	11	0 31	1	2	309	5	0	13 289	0	672	2,667	0	0 0 0
5:00 PM	0	11	0 2	0	11	0 53	1	0	287	4	0	13 320	2	704	2,612	0	0 0 1
5:15 PM	0	7	0 1	0	6	0 35	3	1	311	1	0	8 283	6	662	2,539	0	0 0 0
5:30 PM	0	9	0 1	0	3	0 23	1	2	279	1	0	9 297	4	629	2,402	0	0 0 0
5:45 PM	0	6	0 2	0	5	0 35	2	4	254	6	0	17 281	5	617		0	0 0 0
6:00 PM	0	7	0 1	0	2	0 38	6	0	288	2	0	13 272	2	631		0	0 0 0
6:15 PM	0	5	0 0	0	5	0 16	1	2	232	1	0	7 255	1	525		1	0 0 0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound			Westbound			Northbound			Southbound			Total
	U-Turn	Left	Thru Right	U-Turn	Left	Thru Right	U-Turn	Left	Thru Right	U-Turn	Left	Thru Right	
Articulated Trucks	0	0	0 2	0	0	0 3	0	1	62	5	0	3 78	1 155
Lights	0	31	0 43	0	41	0 141	10	8	1,080	8	1	46 1,093	8 2,510
Mediums	0	0	0 2	0	2	0 12	0	3	49	4	0	17 51	1 141
Total	0	31	0 47	0	43	0 156	10	12	1,191	17	1	66 1,222	10 2,806



(303) 216-2439
www.alltrafficdata.net

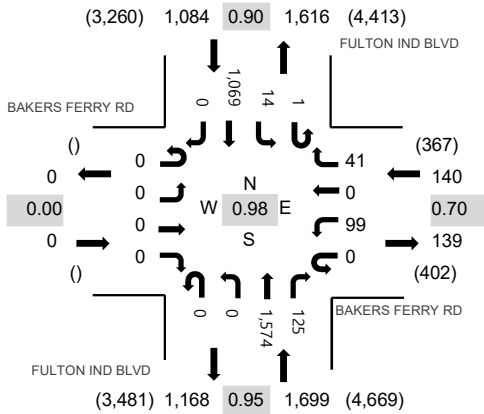
Location: #6 FULTON IND BLVD & BAKERS FERRY RD PM

Date: Wednesday, May 5, 2021

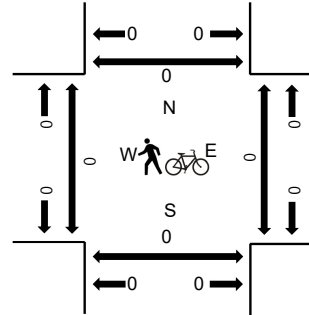
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 04:30 PM - 04:45 PM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	BAKERS FERRY RD Eastbound				BAKERS FERRY RD Westbound				FULTON IND BLVD Northbound				FULTON IND BLVD Southbound				Rolling Pedestrian Crossings			
	U-Turn		Thru		U-Turn		Thru		U-Turn		Thru		U-Turn		Thru		Hour		West East	
	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Total	Hour	West	East
3:30 PM	0	0	0	0	0	21	0	11	0	0	425	32	3	5	273	0	770	2,857	0	0
3:45 PM	0	0	0	0	0	24	0	4	0	0	310	36	0	2	251	0	627	2,831	0	1
4:00 PM	0	0	0	0	0	44	0	8	0	0	387	35	0	5	308	0	787	2,922	0	0
4:15 PM	0	0	0	0	0	20	0	11	0	0	347	22	6	9	258	0	673	2,877	0	0
4:30 PM	0	0	0	0	0	24	0	11	0	0	413	35	0	1	260	0	744	2,923	0	0
4:45 PM	0	0	0	0	0	21	0	7	0	0	384	30	1	6	269	0	718	2,833	0	0
5:00 PM	0	0	0	0	0	31	0	11	0	0	399	32	0	4	265	0	742	2,779	0	0
5:15 PM	0	0	0	0	0	23	0	12	0	0	378	28	0	3	275	0	719	2,691	0	0
5:30 PM	0	0	0	0	0	15	0	3	0	0	328	24	1	4	279	0	654	2,516	0	0
5:45 PM	0	0	0	0	0	25	0	4	0	0	320	37	0	4	274	0	664		0	0
6:00 PM	0	0	0	0	0	17	0	4	0	0	336	28	1	0	268	0	654		0	0
6:15 PM	0	0	0	0	0	14	0	2	0	0	286	17	0	3	222	0	544		0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	4	0	5	0	0	75	3	0	2	76	0	165
Lights	0	0	0	0	0	91	0	34	0	0	1,453	120	1	9	909	0	2,617
Mediums	0	0	0	0	0	4	0	2	0	0	46	2	0	3	84	0	141
Total	0	0	0	0	0	99	0	41	0	0	1,574	125	1	14	1,069	0	2,923



(303) 216-2439
www.alltrafficdata.net

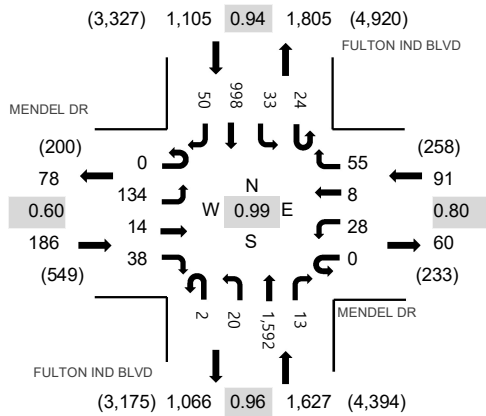
Location: #7 FULTON IND BLVD & MENDEL DR PM

Date: Wednesday, May 5, 2021

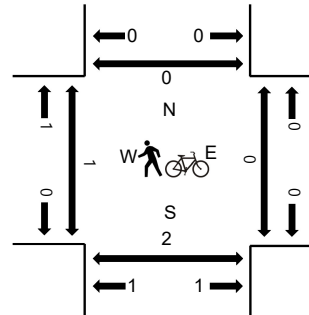
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	MENDEL DR				MENDEL DR				FULTON IND BLVD				FULTON IND BLVD				Total	Rolling Hour	Pedestrian Crossings				
	Eastbound				Westbound				Northbound				Southbound						West	East	South	North	
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right							
3:30 PM	0	66	16	9	0	6	1	13	1	3	437	8	5	16	249	9	839	2,945	0	0	0	0	
3:45 PM	0	36	1	11	0	9	2	10	0	2	300	4	5	21	208	14	623	2,862	0	0	0	0	
4:00 PM	0	37	1	18	0	16	3	17	0	5	386	6	4	9	282	6	790	2,982	0	1	1	0	
4:15 PM	0	17	0	5	0	9	1	18	1	4	366	5	8	6	244	9	693	2,955	0	0	0	0	
4:30 PM	0	37	3	6	0	6	3	19	1	8	411	3	14	9	230	6	756	3,009	1	0	1	0	
4:45 PM	0	27	2	11	0	10	2	11	0	7	390	3	2	4	252	22	743	2,921	0	0	0	0	
5:00 PM	0	36	5	11	0	7	2	14	0	2	405	6	6	12	248	9	763	2,830	0	0	1	0	
5:15 PM	0	34	4	10	0	5	1	11	1	3	386	1	2	8	268	13	747	2,754	0	0	0	0	
5:30 PM	0	26	2	7	0	4	0	7	0	2	304	4	3	10	282	17	668	2,574	0	0	0	0	
5:45 PM	0	28	2	3	0	7	1	16	0	2	296	7	4	19	242	25	652		1	0	0	0	
6:00 PM	0	50	4	6	0	4	1	9	0	0	339	2	2	13	249	8	687		1	0	0	0	
6:15 PM	0	13	2	3	0	4	1	8	0	0	280	3	5	12	230	6	567		0	0	0	0	

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	8	1	5	0	2	1	1	0	3	72	2	0	2	69	3	169
Lights	0	119	12	31	0	24	5	50	1	15	1,474	11	23	30	853	42	2,690
Mediums	0	7	1	2	0	2	2	4	1	2	46	0	1	1	76	5	150
Total	0	134	14	38	0	28	8	55	2	20	1,592	13	24	33	998	50	3,009



(303) 216-2439
www.alltrafficdata.net

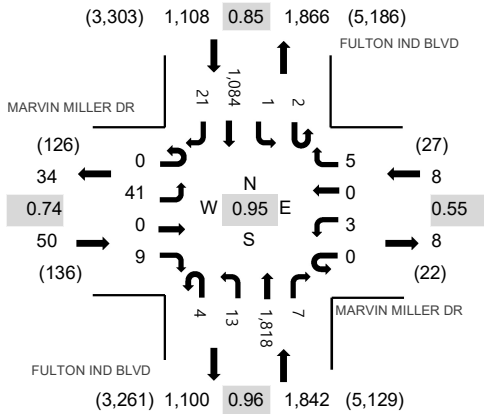
Location: #8 FULTON IND BLVD & MARVIN MILLER DR PM

Date: Wednesday, May 5, 2021

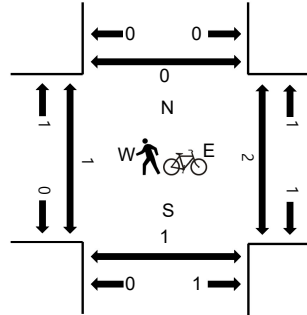
Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:00 PM - 04:15 PM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	MARVIN MILLER DR Eastbound				MARVIN MILLER DR Westbound				FULTON IND BLVD Northbound				FULTON IND BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	4	0	2	0	1	0	1	2	2	540	1	0	0	270	7	830	2,952	0	0	0	0
3:45 PM	0	8	0	3	0	0	0	1	3	1	336	1	2	1	260	5	621	2,852	0	0	0	0
4:00 PM	0	16	0	3	0	1	0	2	0	1	485	2	0	0	272	9	791	3,008	0	0	0	0
4:15 PM	0	11	0	2	0	1	0	1	2	4	407	1	1	1	275	4	710	2,955	0	1	0	0
4:30 PM	0	10	0	3	0	0	0	1	1	4	477	2	0	0	228	4	730	2,984	0	0	1	0
4:45 PM	0	4	0	1	0	1	0	1	1	4	449	2	1	0	309	4	777	3,007	1	1	0	0
5:00 PM	0	16	0	3	0	0	0	5	0	2	454	1	1	2	251	3	738	2,845	0	0	0	0
5:15 PM	0	9	0	1	0	2	0	1	1	5	454	1	1	1	254	9	739	2,804	0	0	0	0
5:30 PM	0	8	0	3	0	1	0	0	2	8	383	0	0	1	331	16	753	2,659	0	0	0	0
5:45 PM	0	5	0	5	0	0	0	1	2	4	337	1	1	1	252	6	615		1	0	0	0
6:00 PM	0	6	0	2	0	0	0	4	1	9	413	2	1	0	251	8	697		0	0	0	0
6:15 PM	0	7	0	4	0	0	0	2	0	2	318	1	1	0	254	5	594		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	1	0	0	84	0	0	0	107	0	192
Lights	0	41	0	9	0	1	0	0	3	13	1,669	1	2	0	902	18	2,659
Mediums	0	0	0	0	0	2	0	4	1	0	65	6	0	1	75	3	157
Total	0	41	0	9	0	3	0	5	4	13	1,818	7	2	1	1,084	21	3,008

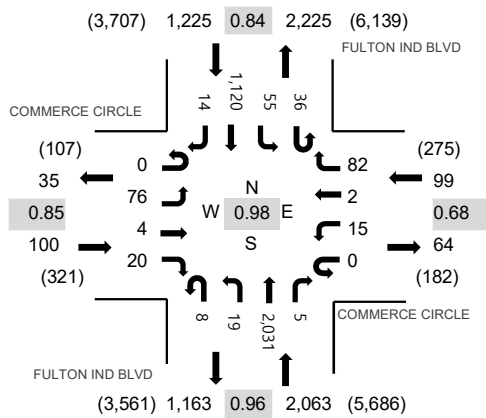
Location: #9 FULTON IND BLVD & COMMERCE CIRCLE PM

Date: Wednesday, May 5, 2021

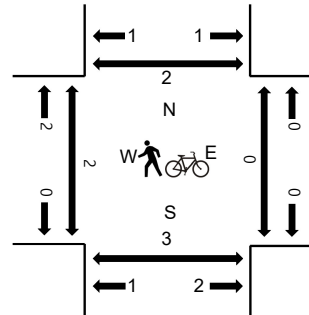
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	COMMERCE CIRCLE				COMMERCE CIRCLE				FULTON IND BLVD				FULTON IND BLVD				Rolling Pedestrian Crossings							
	Eastbound				Westbound				Northbound				Southbound				Total	Hour	West	East	South	North		
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right								
3:30 PM	0	29	0	4	0	7	0	8	2	4	573	2	14	5	280	6	934	3,466	1	0	1	1		
3:45 PM	0	27	1	4	0	7	0	18	4	3	426	0	8	22	296	1	817	3,373	0	0	4	0		
4:00 PM	0	13	0	3	0	10	0	31	3	3	473	0	7	16	262	5	826	3,423	0	0	1	0		
4:15 PM	0	17	2	4	0	5	1	8	3	5	507	1	9	22	301	4	889	3,487	0	0	0	1		
4:30 PM	0	30	0	5	0	4	0	27	3	5	472	2	9	13	268	3	841	3,432	1	0	0	1		
4:45 PM	0	15	0	4	0	1	0	24	1	4	519	2	12	9	271	5	867	3,467	0	0	2	0		
5:00 PM	0	14	2	7	0	5	1	23	1	5	533	0	6	11	280	2	890	3,346	1	0	1	0		
5:15 PM	0	18	0	17	0	3	1	13	2	7	489	1	8	9	260	6	834	3,234	0	3	1	1		
5:30 PM	0	22	0	8	0	0	1	10	4	4	439	5	9	17	350	7	876	3,091	1	0	3	2		
5:45 PM	0	18	3	5	0	2	0	16	6	4	373	1	4	12	299	3	746		0	1	2	5		
6:00 PM	0	22	1	5	0	3	1	21	3	2	412	1	13	15	274	5	778		1	0	0	0		
6:15 PM	0	13	0	8	0	7	0	17	4	6	364	3	6	4	256	3	691		0	0	0	1		

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	91	0	0	0	96	0	187
Lights	0	74	4	19	0	13	2	82	8	19	1,861	4	35	54	921	13	3,109
Mediums	0	2	0	1	0	2	0	0	0	0	79	1	1	1	103	1	191
Total	0	76	4	20	0	15	2	82	8	19	2,031	5	36	55	1,120	14	3,487



(303) 216-2439
www.alltrafficdata.net

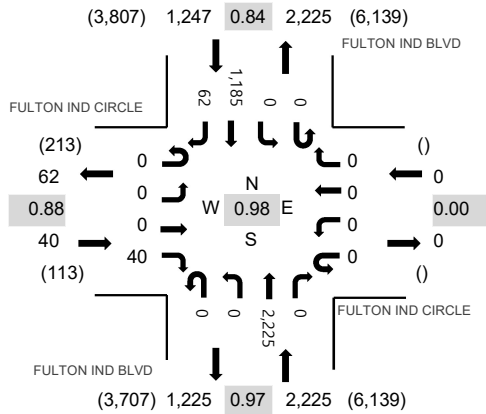
Location: #10 FULTON IND BLVD & FULTON IND CIRCLE PM

Date: Wednesday, May 5, 2021

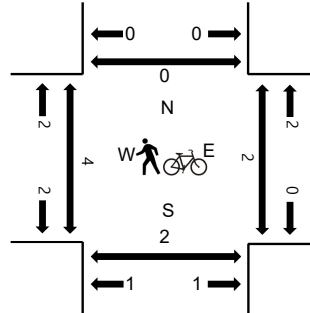
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 04:15 PM - 04:30 PM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	FULTON IND CIRCLE				FULTON IND CIRCLE				FULTON IND BLVD				FULTON IND BLVD				Rolling Pedestrian Crossings							
	Eastbound				Westbound				Northbound				Southbound				Total	Hour	West East South North					
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right								
3:30 PM	0	0	0	10	0	0	0	0	0	0	624	0	0	0	295	24	953	3,500	1	0	2	0		
3:45 PM	0	0	0	10	0	0	0	0	0	0	479	0	0	0	317	18	824	3,400	0	0	0	0		
4:00 PM	0	0	0	8	0	0	0	0	0	0	524	0	0	0	282	16	830	3,458	1	0	0	0		
4:15 PM	0	0	0	11	0	0	0	0	0	0	541	0	0	0	325	16	893	3,512	0	1	1	0		
4:30 PM	0	0	0	12	0	0	0	0	0	0	538	0	0	0	281	22	853	3,443	2	1	1	0		
4:45 PM	0	0	0	11	0	0	0	0	0	0	570	0	0	0	286	15	882	3,476	0	0	0	0		
5:00 PM	0	0	0	6	0	0	0	0	0	0	576	0	0	0	293	9	884	3,340	2	0	0	0		
5:15 PM	0	0	0	9	0	0	0	0	0	0	528	0	0	0	274	13	824	3,251	1	3	2	1		
5:30 PM	0	0	0	10	0	0	0	0	0	0	480	0	0	0	373	23	886	3,116	4	2	2	0		
5:45 PM	0	0	0	8	0	0	0	0	0	0	411	0	0	0	310	17	746		2	6	5	0		
6:00 PM	0	0	0	8	0	0	0	0	0	0	468	0	0	0	299	20	795		3	0	1	0		
6:15 PM	0	0	0	10	0	0	0	0	0	0	400	0	0	0	259	20	689		3	1	1	0		

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	91	0	0	0	96	0	187
Lights	0	0	0	40	0	0	0	0	0	0	2,052	0	0	0	983	59	3,134
Mediums	0	0	0	0	0	0	0	0	0	0	82	0	0	0	106	3	191
Total	0	0	0	40	0	0	0	0	0	0	2,225	0	0	0	1,185	62	3,512

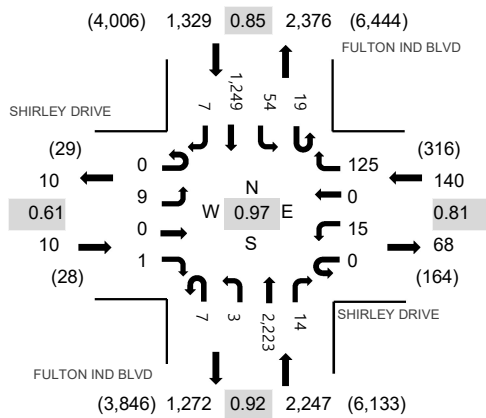
Location: #11 FULTON IND BLVD & SHIRLEY DRIVE PM

Date: Wednesday, May 5, 2021

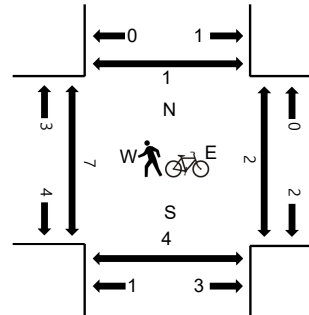
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 04:45 PM - 05:00 PM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	SHIRLEY DRIVE				SHIRLEY DRIVE				FULTON IND BLVD				FULTON IND BLVD				Total	Hour	Rolling Pedestrian Crossings			
	Eastbound				Westbound				Northbound				Southbound						West	East	South	North
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right						
3:30 PM	0	1	0	1	0	2	0	11	0	0	604	4	6	8	327	3	967	3,626	3	1	0	0
3:45 PM	0	2	0	2	0	3	0	23	3	1	474	4	10	7	327	0	856	3,532	0	0	1	0
4:00 PM	0	2	0	5	0	5	0	25	2	1	528	2	9	12	280	2	873	3,640	4	0	0	0
4:15 PM	0	3	0	0	0	2	0	23	1	2	535	4	3	15	341	1	930	3,726	0	2	1	0
4:30 PM	0	3	0	0	0	6	0	28	3	0	502	5	8	16	300	2	873	3,647	1	0	0	0
4:45 PM	0	2	0	0	0	3	0	35	2	1	604	1	3	14	297	2	964	3,686	0	0	2	0
5:00 PM	0	1	0	1	0	4	0	39	1	0	582	4	5	9	311	2	959	3,506	5	0	1	1
5:15 PM	0	0	0	0	0	4	0	19	0	1	523	5	7	8	280	4	851	3,355	0	0	0	1
5:30 PM	0	1	0	0	0	5	0	17	2	0	477	4	4	11	390	1	912	3,210	3	2	1	2
5:45 PM	0	1	0	1	0	2	0	26	2	1	395	1	13	7	332	3	784		1	0	0	0
6:00 PM	0	1	0	1	0	2	0	12	0	0	462	4	8	7	310	1	808		2	0	0	0
6:15 PM	0	0	0	0	0	4	0	16	2	0	381	3	10	9	280	1	706		2	1	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	1	0	2	0	0	92	0	0	7	96	0	198
Lights	0	8	0	1	0	13	0	119	7	3	2,051	12	18	38	1,048	7	3,325
Mediums	0	1	0	0	0	1	0	4	0	0	80	2	1	9	105	0	203
Total	0	9	0	1	0	15	0	125	7	3	2,223	14	19	54	1,249	7	3,726

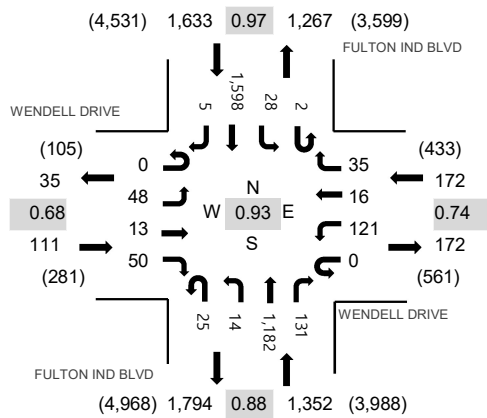
Location: #12 FULTON IND BLVD & WENDELL DRIVE PM

Date: Wednesday, May 5, 2021

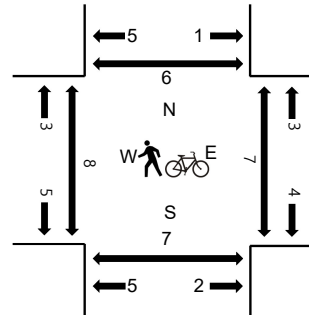
Peak Hour: 04:45 PM - 05:45 PM

Peak 15-Minutes: 04:45 PM - 05:00 PM

Peak Hour - Motorized Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WENDELL DRIVE				WENDELL DRIVE				FULTON IND BLVD				FULTON IND BLVD				Total	Rolling Hour	Pedestrian Crossings				
	Eastbound				Westbound				Northbound				Southbound						West	East	South	North	
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right							
3:30 PM	0	7	5	17	0	32	1	10	6	6	292	34	0	6	327	1	744	3,017	1	3	0	1	
3:45 PM	0	5	5	9	0	22	3	5	9	10	293	52	0	5	349	1	768	3,050	2	1	1	2	
4:00 PM	0	5	2	12	0	22	1	6	12	3	258	26	1	11	369	3	731	3,165	1	1	1	0	
4:15 PM	0	4	4	7	0	18	0	4	6	4	277	45	2	5	396	2	774	3,212	6	0	4	3	
4:30 PM	0	6	1	22	0	23	5	5	7	4	262	36	2	7	395	2	777	3,259	4	1	0	1	
4:45 PM	0	11	6	12	0	37	2	7	10	3	320	50	0	7	414	4	883	3,268	4	0	0	3	
5:00 PM	0	22	2	21	0	26	2	10	7	4	266	25	0	10	383	0	778	3,111	2	3	1	1	
5:15 PM	0	10	1	9	0	19	3	8	5	3	316	28	2	6	411	0	821	3,077	1	4	3	1	
5:30 PM	0	5	4	8	0	39	9	10	3	4	280	28	0	5	390	1	786	2,957	1	0	3	1	
5:45 PM	0	5	2	12	0	21	2	6	1	4	289	42	0	10	330	2	726		2	4	5	2	
6:00 PM	0	9	2	11	0	18	3	7	9	5	272	35	0	2	371	0	744		0	1	3	0	
6:15 PM	0	7	1	10	0	36	4	7	5	3	283	46	3	5	290	1	701		3	1	3	1	

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	4	0	0	0	0	0	2	49	1	0	0	71	0	127
Lights	0	48	12	45	0	115	16	34	24	10	1,098	124	2	28	1,457	5	3,018
Mediums	0	0	1	1	0	6	0	1	1	2	35	6	0	0	70	0	123
Total	0	48	13	50	0	121	16	35	25	14	1,182	131	2	28	1,598	5	3,268

HCS Roadway Segment Analyses
2021 Existing Conditions

MULTILANE HIGHWAYS WORKSHEET(Direction 1)			
<div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;"> x </div>			
General Information		Site Information	
Analyst	David A. Fairlie, P.E.	Highway/Direction to Travel	FIB
Agency or Company	ATLAS	From/To	Campbellton Rd. to Camp Creek
Date Performed	6/25/2021	Jurisdiction	Fulton County
Analysis Time Period	Peak hour	Analysis Year	2021
Project Description Fulton Industrial Boulevard (SR 70) Freight Cluster Plan			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			
Flow Inputs			
Volume, V (veh/h)	960	Peak-Hour Factor, PHF	0.93
AADT(veh/h)		%Trucks and Buses, P _T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P _R	0
Peak-Hour Direction Prop, D		General Terrain:	Rolling
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2
Calculate Flow Adjustments			
f _p	1.00	E _R	2.0
E _T	2.5	f _{HV}	0.870
Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f _{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f _{LC} (mi/h)	0.4
Access Points, A (A/mi)	4	f _A (mi/h)	1.0
Median Type, M	Divided	f _M (mi/h)	0.0
FFS (measured)		FFS (mi/h)	53.6
Base Free-Flow Speed, BFFS	55.0		
Operations		Design	
<u>Operational (LOS)</u> Flow Rate, v _p (pc/h/ln) 593 Speed, S (mi/h) 55.0 D (pc/mi/ln) 10.8 LOS A		<u>Design (N)</u> Required Number of Lanes, N Flow Rate, v _p (pc/h) Max Service Flow Rate (pc/h/ln) Design LOS	
Bicycle Level of Service			

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	516.1
Effective width, W_v (Eq. 15-29) ft	16.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	6.71
Bicycle level of service (Exhibit 15-4)	F

MULTILANE HIGHWAYS WORKSHEET(Direction 2)			
<div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;"> X </div>			
General Information		Site Information	
Analyst	David A. Fairlie, P.E.	Highway/Direction to Travel	FIB
Agency or Company	ATLAS	From/To	Campbellton Rd. to Camp Creek
Date Performed	6/25/2021	Jurisdiction	Fulton County
Analysis Time Period	Peak hour	Analysis Year	2021
Project Description Fulton Industrial Boulevard (SR 70) Freight Cluster Plan			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			
Flow Inputs			
Volume, V (veh/h)	1255	Peak-Hour Factor, PHF	0.95
AADT(veh/h)		%Trucks and Buses, P _T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P _R	0
Peak-Hour Direction Prop, D		General Terrain:	Rolling
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2
Calculate Flow Adjustments			
f _p	1.00	E _R	2.0
E _T	2.5	f _{HV}	0.870
Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f _{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f _{LC} (mi/h)	0.4
Access Points, A (A/mi)	5	f _A (mi/h)	1.3
Median Type, M	Divided	f _M (mi/h)	0.0
FFS (measured)		FFS (mi/h)	53.3
Base Free-Flow Speed, BFFS	55.0		
Operations		Design	
Operational (LOS)		Design (N)	
Flow Rate, v _p (pc/h/ln)	759	Required Number of Lanes, N	
Speed, S (mi/h)	55.0	Flow Rate, v _p (pc/h)	
D (pc/mi/ln)	13.8	Max Service Flow Rate (pc/h/ln)	
LOS	B	Design LOS	
Bicycle Level of Service			

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	660.5
Effective width, W_v (Eq. 15-29) ft	16.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	6.83
Bicycle level of service (Exhibit 15-4)	F

Copyright © 2013 University of Florida, All Rights Reserved

HCS 2010™ Version 6.50

Generated: 6/25/2021 11:07 AM

MULTILANE HIGHWAYS WORKSHEET(Direction 1)			
<div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;"> X </div>			
General Information		Site Information	
Analyst	David A. Fairlie, P.E.	Highway/Direction to Travel	FIB
Agency or Company	ATLAS	From/To	Camp Creek to Wharton Dr.
Date Performed	6/25/2021	Jurisdiction	Fulton County
Analysis Time Period	Peak hour	Analysis Year	2021
Project Description Fulton Industrial Boulevard (SR 70) Freight Cluster Plan			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			
Flow Inputs			
Volume, V (veh/h)	1579	Peak-Hour Factor, PHF	0.92
AADT(veh/h)		%Trucks and Buses, P _T	8
Peak-Hour Prop of AADT (veh/d)		%RVs, P _R	0
Peak-Hour Direction Prop, D		General Terrain:	Rolling
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2
Calculate Flow Adjustments			
f _p	1.00	E _R	2.0
E _T	2.5	f _{HV}	0.893
Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f _{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f _{LC} (mi/h)	0.4
Access Points, A (A/mi)	7	f _A (mi/h)	1.8
Median Type, M	Divided	f _M (mi/h)	0.0
FFS (measured)		FFS (mi/h)	42.8
Base Free-Flow Speed, BFFS	45.0		
Operations		Design	
Operational (LOS)		Design (N)	
Flow Rate, v _p (pc/h/ln)	961	Required Number of Lanes, N	
Speed, S (mi/h)	45.0	Flow Rate, v _p (pc/h)	
D (pc/mi/ln)	21.4	Max Service Flow Rate (pc/h/ln)	
LOS	C	Design LOS	
Bicycle Level of Service			

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	858.2
Effective width, W_v (Eq. 15-29) ft	16.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	6.20
Bicycle level of service (Exhibit 15-4)	F

Copyright © 2013 University of Florida, All Rights Reserved

HCS 2010™ Version 6.50

Generated: 6/25/2021 11:53 AM

MULTILANE HIGHWAYS WORKSHEET(Direction 2)			
<div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;"> X </div>			
General Information		Site Information	
Analyst	David A. Fairlie, P.E.	Highway/Direction to Travel	FIB
Agency or Company	ATLAS	From/To	Camp Creek to Wharton Dr.
Date Performed	6/25/2021	Jurisdiction	Fulton County
Analysis Time Period	Peak hour	Analysis Year	2021
Project Description Fulton Industrial Boulevard (SR 70) Freight Cluster Plan			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			
Flow Inputs			
Volume, V (veh/h)	1255	Peak-Hour Factor, PHF	0.98
AADT(veh/h)		%Trucks and Buses, P _T	9
Peak-Hour Prop of AADT (veh/d)		%RVs, P _R	0
Peak-Hour Direction Prop, D		General Terrain:	Rolling
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2
Calculate Flow Adjustments			
f _p	1.00	E _R	2.0
E _T	2.5	f _{HV}	0.881
Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f _{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f _{LC} (mi/h)	0.4
Access Points, A (A/mi)	7	f _A (mi/h)	1.8
Median Type, M	Divided	f _M (mi/h)	0.0
FFS (measured)		FFS (mi/h)	42.8
Base Free-Flow Speed, BFFS	45.0		
Operations		Design	
Operational (LOS)		Design (N)	
Flow Rate, v _p (pc/h/ln)	726	Required Number of Lanes, N	
Speed, S (mi/h)	45.0	Flow Rate, v _p (pc/h)	
D (pc/mi/ln)	16.1	Max Service Flow Rate (pc/h/ln)	
LOS	B	Design LOS	
Bicycle Level of Service			

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	640.3
Effective width, W_v (Eq. 15-29) ft	16.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	6.44
Bicycle level of service (Exhibit 15-4)	F

MULTILANE HIGHWAYS WORKSHEET(Direction 1)			
<div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;"> x </div>			
General Information		Site Information	
Analyst	David A. Fairlie, P.E.	Highway/Direction to Travel	FIB
Agency or Company	ATLAS	From/To	Wharton Dr. to I-20
Date Performed	6/25/2021	Jurisdiction	Fulton County
Analysis Time Period	Peak hour	Analysis Year	2021
Project Description Fulton Industrial Boulevard (SR 70) Freight Cluster Plan			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			
Flow Inputs			
Volume, V (veh/h)	1807	Peak-Hour Factor, PHF	0.93
AADT(veh/h)		%Trucks and Buses, P _T	8
Peak-Hour Prop of AADT (veh/d)		%RVs, P _R	0
Peak-Hour Direction Prop, D		General Terrain:	Rolling
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	3
Calculate Flow Adjustments			
f _p	1.00	E _R	2.0
E _T	2.5	f _{HV}	0.893
Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f _{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f _{LC} (mi/h)	0.4
Access Points, A (A/mi)	8	f _A (mi/h)	2.0
Median Type, M	Divided	f _M (mi/h)	0.0
FFS (measured)		FFS (mi/h)	42.6
Base Free-Flow Speed, BFFS	45.0		
Operations		Design	
Operational (LOS)		Design (N)	
Flow Rate, v _p (pc/h/ln)	725	Required Number of Lanes, N	
Speed, S (mi/h)	45.0	Flow Rate, v _p (pc/h)	
D (pc/mi/ln)	16.1	Max Service Flow Rate (pc/h/ln)	
LOS	B	Design LOS	
Bicycle Level of Service			

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	647.7
Effective width, W_v (Eq. 15-29) ft	16.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	6.05
Bicycle level of service (Exhibit 15-4)	F

MULTILANE HIGHWAYS WORKSHEET(Direction 2)			
<div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;"> X </div>			
General Information		Site Information	
Analyst	David A. Fairlie, P.E.	Highway/Direction to Travel	FIB
Agency or Company	ATLAS	From/To	Wharton Dr. to I-20
Date Performed	6/25/2021	Jurisdiction	Fulton County
Analysis Time Period	Peak hour	Analysis Year	2021
Project Description Fulton Industrial Boulevard (SR 70) Freight Cluster Plan			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			
Flow Inputs			
Volume, V (veh/h)	1547	Peak-Hour Factor, PHF	0.95
AADT(veh/h)		%Trucks and Buses, P _T	9
Peak-Hour Prop of AADT (veh/d)		%RVs, P _R	0
Peak-Hour Direction Prop, D		General Terrain:	Mountainous
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	3
Calculate Flow Adjustments			
f _p	1.00	E _R	4.0
E _T	4.5	f _{HV}	0.760
Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f _{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f _{LC} (mi/h)	0.4
Access Points, A (A/mi)	8	f _A (mi/h)	2.0
Median Type, M	Divided	f _M (mi/h)	0.0
FFS (measured)		FFS (mi/h)	42.6
Base Free-Flow Speed, BFFS	45.0		
Operations		Design	
Operational (LOS)		Design (N)	
Flow Rate, v _p (pc/h/ln)	713	Required Number of Lanes, N	
Speed, S (mi/h)	45.0	Flow Rate, v _p (pc/h)	
D (pc/mi/ln)	15.8	Max Service Flow Rate (pc/h/ln)	
LOS	B	Design LOS	
Bicycle Level of Service			

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	542.8
Effective width, W_v (Eq. 15-29) ft	16.00
Effective speed factor, S_t (Eq. 15-30)	4.42
Bicycle level of service score, BLOS (Eq. 15-31)	6.06
Bicycle level of service (Exhibit 15-4)	F

MULTILANE HIGHWAYS WORKSHEET(Direction 1)			
<div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;"> X </div>			
General Information		Site Information	
Analyst	David A. Fairlie, P.E.	Highway/Direction to Travel	FIB
Agency or Company	ATLAS	From/To	1-20 to Donald Lee Hollowell
Date Performed	6/25/2021	Jurisdiction	Fulton County
Analysis Time Period	Peak hour	Analysis Year	2021
Project Description Fulton Industrial Boulevard (SR 70) Freight Cluster Plan			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			
Flow Inputs			
Volume, V (veh/h)	1121	Peak-Hour Factor, PHF	0.92
AADT(veh/h)		%Trucks and Buses, P _T	21
Peak-Hour Prop of AADT (veh/d)		%RVs, P _R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV}	0.905
Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f _{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f _{LC} (mi/h)	0.4
Access Points, A (A/mi)	8	f _A (mi/h)	2.0
Median Type, M	Divided	f _M (mi/h)	0.0
FFS (measured)		FFS (mi/h)	42.6
Base Free-Flow Speed, BFFS	45.0		
Operations		Design	
Operational (LOS)		Design (N)	
Flow Rate, v _p (pc/h/ln)	673	Required Number of Lanes, N	
Speed, S (mi/h)	45.0	Flow Rate, v _p (pc/h)	
D (pc/mi/ln)	15.0	Max Service Flow Rate (pc/h/ln)	
LOS	B	Design LOS	
Bicycle Level of Service			

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	609.2
Effective width, W_v (Eq. 15-29) ft	16.00
Effective speed factor, S_t (Eq. 15-30)	4.42
Bicycle level of service score, BLOS (Eq. 15-31)	11.73
Bicycle level of service (Exhibit 15-4)	F

MULTILANE HIGHWAYS WORKSHEET(Direction 2)			
<div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;"> X </div>			
General Information		Site Information	
Analyst	David A. Fairlie, P.E.	Highway/Direction to Travel	FIB
Agency or Company	ATLAS	From/To	1-20 to Donald Lee Hollowell
Date Performed	6/25/2021	Jurisdiction	Fulton County
Analysis Time Period	Peak hour	Analysis Year	2021
Project Description Fulton Industrial Boulevard (SR 70) Freight Cluster Plan			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			
Flow Inputs			
Volume, V (veh/h)	1287	Peak-Hour Factor, PHF	0.92
AADT(veh/h)		%Trucks and Buses, P _T	20
Peak-Hour Prop of AADT (veh/d)		%RVs, P _R	0
Peak-Hour Direction Prop, D		General Terrain:	Mountainous
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2
Calculate Flow Adjustments			
f _p	1.00	E _R	4.0
E _T	4.5	f _{HV}	0.588
Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f _{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f _{LC} (mi/h)	0.4
Access Points, A (A/mi)	8	f _A (mi/h)	2.0
Median Type, M	Divided	f _M (mi/h)	0.0
FFS (measured)		FFS (mi/h)	42.6
Base Free-Flow Speed, BFFS	45.0		
Operations		Design	
Operational (LOS)		Design (N)	
Flow Rate, v _p (pc/h/ln)	1189	Required Number of Lanes, N	
Speed, S (mi/h)	45.0	Flow Rate, v _p (pc/h)	
D (pc/mi/ln)	26.4	Max Service Flow Rate (pc/h/ln)	
LOS	D	Design LOS	
Bicycle Level of Service			

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	699.5
Effective width, W_v (Eq. 15-29) ft	16.00
Effective speed factor, S_t (Eq. 15-30)	4.42
Bicycle level of service score, BLOS (Eq. 15-31)	11.22
Bicycle level of service (Exhibit 15-4)	F

HCS Roadway Segment Analysis

Future 2031 Condition

MULTILANE HIGHWAYS WORKSHEET(Direction 1)			
<div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;"> X </div>			
General Information		Site Information	
Analyst	David A. Fairlie, P.E.	Highway/Direction to Travel	FIB
Agency or Company	ATLAS	From/To	Campbellton Rd. to Camp Creek
Date Performed	6/25/2021	Jurisdiction	Fulton County
Analysis Time Period	Peak hour	Analysis Year	2031
Project Description Fulton Industrial Boulevard (SR 70) Freight Cluster Plan			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			
Flow Inputs			
Volume, V (veh/h)	1114	Peak-Hour Factor, PHF	0.93
AADT(veh/h)		%Trucks and Buses, P _T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P _R	0
Peak-Hour Direction Prop, D		General Terrain:	Rolling
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2
Calculate Flow Adjustments			
f _p	1.00	E _R	2.0
E _T	2.5	f _{HV}	0.870
Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f _{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f _{LC} (mi/h)	0.4
Access Points, A (A/mi)	4	f _A (mi/h)	1.0
Median Type, M	Divided	f _M (mi/h)	0.0
FFS (measured)		FFS (mi/h)	53.6
Base Free-Flow Speed, BFFS	55.0		
Operations		Design	
Operational (LOS)		Design (N)	
Flow Rate, v _p (pc/h/ln)	688	Required Number of Lanes, N	
Speed, S (mi/h)	55.0	Flow Rate, v _p (pc/h)	
D (pc/mi/ln)	12.5	Max Service Flow Rate (pc/h/ln)	
LOS	B	Design LOS	
Bicycle Level of Service			

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	598.9
Effective width, W_v (Eq. 15-29) ft	16.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	6.78
Bicycle level of service (Exhibit 15-4)	F

MULTILANE HIGHWAYS WORKSHEET(Direction 2)			
<div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;"> X </div>			
General Information		Site Information	
Analyst	David A. Fairlie, P.E.	Highway/Direction to Travel	FIB
Agency or Company	ATLAS	From/To	Campbellton Rd. to Camp Creek
Date Performed	6/25/2021	Jurisdiction	Fulton County
Analysis Time Period	Peak hour	Analysis Year	2031
Project Description Fulton Industrial Boulevard (SR 70) Freight Cluster Plan			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	<input type="checkbox"/> Plan. (vp)
Flow Inputs			
Volume, V (veh/h)	1456	Peak-Hour Factor, PHF	0.95
AADT(veh/h)		%Trucks and Buses, P _T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P _R	0
Peak-Hour Direction Prop, D		General Terrain:	Rolling
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2
Calculate Flow Adjustments			
f _p	1.00	E _R	2.0
E _T	2.5	f _{HV}	0.870
Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f _{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f _{LC} (mi/h)	0.4
Access Points, A (A/mi)	5	f _A (mi/h)	1.3
Median Type, M	Divided	f _M (mi/h)	0.0
FFS (measured)		FFS (mi/h)	53.3
Base Free-Flow Speed, BFFS	55.0		
Operations		Design	
Operational (LOS)		Design (N)	
Flow Rate, v _p (pc/h/ln)	881	Required Number of Lanes, N	
Speed, S (mi/h)	55.0	Flow Rate, v _p (pc/h)	
D (pc/mi/ln)	16.0	Max Service Flow Rate (pc/h/ln)	
LOS	B	Design LOS	
Bicycle Level of Service			

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	766.3
Effective width, W_v (Eq. 15-29) ft	16.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	6.91
Bicycle level of service (Exhibit 15-4)	F

MULTILANE HIGHWAYS WORKSHEET(Direction 1)			
<div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;"> X </div>			
General Information		Site Information	
Analyst	David A. Fairlie, P.E.	Highway/Direction to Travel	FIB
Agency or Company	ATLAS	From/To	Camp Creek to Wharton Dr.
Date Performed	6/25/2021	Jurisdiction	Fulton County
Analysis Time Period	Peak hour	Analysis Year	2031
Project Description Fulton Industrial Boulevard (SR 70) Freight Cluster Plan			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			
Flow Inputs			
Volume, V (veh/h)	1832	Peak-Hour Factor, PHF	0.92
AADT(veh/h)		%Trucks and Buses, P _T	8
Peak-Hour Prop of AADT (veh/d)		%RVs, P _R	0
Peak-Hour Direction Prop, D		General Terrain:	Rolling
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2
Calculate Flow Adjustments			
f _p	1.00	E _R	2.0
E _T	2.5	f _{HV}	0.893
Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f _{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f _{LC} (mi/h)	0.4
Access Points, A (A/mi)	7	f _A (mi/h)	1.8
Median Type, M	Divided	f _M (mi/h)	0.0
FFS (measured)		FFS (mi/h)	42.8
Base Free-Flow Speed, BFFS	45.0		
Operations		Design	
Operational (LOS)		Design (N)	
Flow Rate, v _p (pc/h/ln)	1115	Required Number of Lanes, N	
Speed, S (mi/h)	45.0	Flow Rate, v _p (pc/h)	
D (pc/mi/ln)	24.8	Max Service Flow Rate (pc/h/ln)	
LOS	C	Design LOS	
Bicycle Level of Service			

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	995.7
Effective width, W_v (Eq. 15-29) ft	16.00
Effective speed factor, S_t (Eq. 15-30)	4.42
Bicycle level of service score, BLOS (Eq. 15-31)	6.02
Bicycle level of service (Exhibit 15-4)	F

MULTILANE HIGHWAYS WORKSHEET(Direction 2)			
<div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;"> X </div>			
General Information		Site Information	
Analyst	David A. Fairlie, P.E.	Highway/Direction to Travel	FIB
Agency or Company	ATLAS	From/To	Camp Creek to Wharton Dr.
Date Performed	6/25/2021	Jurisdiction	Fulton County
Analysis Time Period	Peak hour	Analysis Year	2031
Project Description Fulton Industrial Boulevard (SR 70) Freight Cluster Plan			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			
Flow Inputs			
Volume, V (veh/h)	1456	Peak-Hour Factor, PHF	0.98
AADT(veh/h)		%Trucks and Buses, P _T	9
Peak-Hour Prop of AADT (veh/d)		%RVs, P _R	0
Peak-Hour Direction Prop, D		General Terrain:	Rolling
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2
Calculate Flow Adjustments			
f _p	1.00	E _R	2.0
E _T	2.5	f _{HV}	0.881
Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f _{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f _{LC} (mi/h)	0.4
Access Points, A (A/mi)	7	f _A (mi/h)	1.8
Median Type, M	Divided	f _M (mi/h)	0.0
FFS (measured)		FFS (mi/h)	42.8
Base Free-Flow Speed, BFFS	45.0		
Operations		Design	
Operational (LOS)		Design (N)	
Flow Rate, v _p (pc/h/ln)	843	Required Number of Lanes, N	
Speed, S (mi/h)	45.0	Flow Rate, v _p (pc/h)	
D (pc/mi/ln)	18.7	Max Service Flow Rate (pc/h/ln)	
LOS	C	Design LOS	
Bicycle Level of Service			

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	742.9
Effective width, W_v (Eq. 15-29) ft	16.00
Effective speed factor, S_t (Eq. 15-30)	4.42
Bicycle level of service score, BLOS (Eq. 15-31)	6.22
Bicycle level of service (Exhibit 15-4)	F

MULTILANE HIGHWAYS WORKSHEET(Direction 1)			
<div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;"> X </div>			
General Information		Site Information	
Analyst	David A. Fairlie, P.E.	Highway/Direction to Travel	FIB
Agency or Company	ATLAS	From/To	Wharton Dr. to I-20
Date Performed	6/25/2021	Jurisdiction	Fulton County
Analysis Time Period	Peak hour	Analysis Year	2031
Project Description Fulton Industrial Boulevard (SR 70) Freight Cluster Plan			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			
Flow Inputs			
Volume, V (veh/h)	2093	Peak-Hour Factor, PHF	0.93
AADT(veh/h)		%Trucks and Buses, P _T	8
Peak-Hour Prop of AADT (veh/d)		%RVs, P _R	0
Peak-Hour Direction Prop, D		General Terrain:	Rolling
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	3
Calculate Flow Adjustments			
f _p	1.00	E _R	2.0
E _T	2.5	f _{HV}	0.893
Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f _{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f _{LC} (mi/h)	0.4
Access Points, A (A/mi)	8	f _A (mi/h)	2.0
Median Type, M	Divided	f _M (mi/h)	0.0
FFS (measured)		FFS (mi/h)	42.6
Base Free-Flow Speed, BFFS	45.0		
Operations		Design	
Operational (LOS)		Design (N)	
Flow Rate, v _p (pc/h/ln)	840	Required Number of Lanes, N	
Speed, S (mi/h)	45.0	Flow Rate, v _p (pc/h)	
D (pc/mi/ln)	18.7	Max Service Flow Rate (pc/h/ln)	
LOS	C	Design LOS	
Bicycle Level of Service			

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	750.2
Effective width, W_v (Eq. 15-29) ft	16.00
Effective speed factor, S_t (Eq. 15-30)	4.42
Bicycle level of service score, BLOS (Eq. 15-31)	5.88
Bicycle level of service (Exhibit 15-4)	F

MULTILANE HIGHWAYS WORKSHEET(Direction 2)			
<div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;"> X </div>			
General Information		Site Information	
Analyst	David A. Fairlie, P.E.	Highway/Direction to Travel	FIB
Agency or Company	ATLAS	From/To	Wharton Dr. to I-20
Date Performed	6/25/2021	Jurisdiction	Fulton County
Analysis Time Period	Peak hour	Analysis Year	2031
Project Description Fulton Industrial Boulevard (SR 70) Freight Cluster Plan			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			
Flow Inputs			
Volume, V (veh/h)	1795	Peak-Hour Factor, PHF	0.95
AADT(veh/h)		%Trucks and Buses, P _T	9
Peak-Hour Prop of AADT (veh/d)		%RVs, P _R	0
Peak-Hour Direction Prop, D		General Terrain:	Mountainous
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	3
Calculate Flow Adjustments			
f _p	1.00	E _R	4.0
E _T	4.5	f _{HV}	0.760
Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f _{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f _{LC} (mi/h)	0.4
Access Points, A (A/mi)	8	f _A (mi/h)	2.0
Median Type, M	Divided	f _M (mi/h)	0.0
FFS (measured)		FFS (mi/h)	42.6
Base Free-Flow Speed, BFFS	45.0		
Operations		Design	
Operational (LOS)		Design (N)	
Flow Rate, v _p (pc/h/ln)	828	Required Number of Lanes, N	
Speed, S (mi/h)	45.0	Flow Rate, v _p (pc/h)	
D (pc/mi/ln)	18.4	Max Service Flow Rate (pc/h/ln)	
LOS	C	Design LOS	
Bicycle Level of Service			

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	629.8
Effective width, W_v (Eq. 15-29) ft	16.00
Effective speed factor, S_t (Eq. 15-30)	4.42
Bicycle level of service score, BLOS (Eq. 15-31)	6.13
Bicycle level of service (Exhibit 15-4)	F

MULTILANE HIGHWAYS WORKSHEET(Direction 1)			
<div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;"> X </div>			
General Information		Site Information	
Analyst	David A. Fairlie, P.E.	Highway/Direction to Travel	FIB
Agency or Company	ATLAS	From/To	1-20 to Donald Lee Hollowell
Date Performed	6/25/2021	Jurisdiction	Fulton County
Analysis Time Period	Peak hour	Analysis Year	2031
Project Description Fulton Industrial Boulevard (SR 70) Freight Cluster Plan			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			
Flow Inputs			
Volume, V (veh/h)	1300	Peak-Hour Factor, PHF	0.92
AADT(veh/h)		%Trucks and Buses, P _T	21
Peak-Hour Prop of AADT (veh/d)		%RVs, P _R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV}	0.905
Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f _{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f _{LC} (mi/h)	0.4
Access Points, A (A/mi)	8	f _A (mi/h)	2.0
Median Type, M	Divided	f _M (mi/h)	0.0
FFS (measured)		FFS (mi/h)	42.6
Base Free-Flow Speed, BFFS	45.0		
Operations		Design	
Operational (LOS)		Design (N)	
Flow Rate, v _p (pc/h/ln)	780	Required Number of Lanes, N	
Speed, S (mi/h)	45.0	Flow Rate, v _p (pc/h)	
D (pc/mi/ln)	17.3	Max Service Flow Rate (pc/h/ln)	
LOS	B	Design LOS	
Bicycle Level of Service			

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	706.5
Effective width, W_v (Eq. 15-29) ft	16.00
Effective speed factor, S_t (Eq. 15-30)	4.42
Bicycle level of service score, BLOS (Eq. 15-31)	11.81
Bicycle level of service (Exhibit 15-4)	F
























MULTILANE HIGHWAYS WORKSHEET(Direction 2)			
<div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-bottom: 10px;"> X </div>			
General Information		Site Information	
Analyst	David A. Fairlie, P.E.	Highway/Direction to Travel	FIB
Agency or Company	ATLAS	From/To	1-20 to Donald Lee Hollowell
Date Performed	6/25/2021	Jurisdiction	Fulton County
Analysis Time Period	Peak hour	Analysis Year	2031
Project Description Fulton Industrial Boulevard (SR 70) Freight Cluster Plan			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			
Flow Inputs			
Volume, V (veh/h)	1493	Peak-Hour Factor, PHF	0.92
AADT(veh/h)		%Trucks and Buses, P _T	20
Peak-Hour Prop of AADT (veh/d)		%RVs, P _R	0
Peak-Hour Direction Prop, D		General Terrain:	Mountainous
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2
Calculate Flow Adjustments			
f _p	1.00	E _R	4.0
E _T	4.5	f _{HV}	0.588
Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f _{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f _{LC} (mi/h)	0.4
Access Points, A (A/mi)	8	f _A (mi/h)	2.0
Median Type, M	Divided	f _M (mi/h)	0.0
FFS (measured)		FFS (mi/h)	42.6
Base Free-Flow Speed, BFFS	45.0		
Operations		Design	
Operational (LOS)		Design (N)	
Flow Rate, v _p (pc/h/ln)	1379	Required Number of Lanes, N	
Speed, S (mi/h)	45.0	Flow Rate, v _p (pc/h)	
D (pc/mi/ln)	30.6	Max Service Flow Rate (pc/h/ln)	
LOS	D	Design LOS	
Bicycle Level of Service			

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	811.4
Effective width, W_v (Eq. 15-29) ft	16.00
Effective speed factor, S_t (Eq. 15-30)	4.42
Bicycle level of service score, BLOS (Eq. 15-31)	11.31
Bicycle level of service (Exhibit 15-4)	F

Existing (2021) AM Synchro Analysis Report













Syncro Report - Signalized Intersections
10: Cascade Palmetto Hwy/Fulton Ind. Blvd. & Campbellton Rd.

Existing 2021 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	318	390	54	37	190	67	69	577	109	14	151	128
Future Volume (vph)	318	390	54	37	190	67	69	577	109	14	151	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	300		0	400		400	300		300
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.961				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1810	1482	1752	1682	0	1805	3438	1568	1327	2983	1468
Flt Permitted	0.394			0.452			0.565			0.282		
Satd. Flow (perm)	727	1810	1482	834	1682	0	1074	3438	1568	394	2983	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			176		27				176			176
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		808			851			3037			3592	
Travel Time (s)		18.4			19.3			69.0			81.6	
Peak Hour Factor	0.95	0.95	0.95	0.96	0.96	0.96	0.82	0.82	0.82	0.86	0.86	0.86
Heavy Vehicles (%)	3%	5%	9%	3%	7%	13%	0%	5%	3%	36%	21%	10%
Adj. Flow (vph)	335	411	57	39	198	70	84	704	133	16	176	149
Shared Lane Traffic (%)												
Lane Group Flow (vph)	335	411	57	39	268	0	84	704	133	16	176	149
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Syncro Report - Signalized Intersections
10: Cascade Palmetto Hwy/Fulton Ind. Blvd. & Campbellton Rd.

Existing 2021 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	10.2	23.2	23.2	9.5	22.5		9.5	22.8	22.8	9.5	22.8	22.8
Total Split (%)	15.7%	35.7%	35.7%	14.6%	34.6%		14.6%	35.1%	35.1%	14.6%	35.1%	35.1%
Maximum Green (s)	5.7	18.7	18.7	5.0	18.0		5.0	18.3	18.3	5.0	18.3	18.3
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effect Green (s)	22.2	20.3	20.3	18.1	12.9		16.9	16.1	16.1	15.2	12.5	12.5
Actuated g/C Ratio	0.44	0.40	0.40	0.36	0.26		0.34	0.32	0.32	0.30	0.25	0.25
v/c Ratio	0.76	0.56	0.08	0.10	0.60		0.19	0.64	0.21	0.07	0.24	0.30
Control Delay	27.3	19.6	0.2	9.8	21.7		12.8	18.9	2.7	12.3	18.6	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	19.6	0.2	9.8	21.7		12.8	18.9	2.7	12.3	18.6	4.5
LOS	C	B	A	A	C		B	B	A	B	B	A
Approach Delay		21.4			20.2			16.0			12.2	
Approach LOS		C			C			B			B	
90th %ile Green (s)	5.7	18.7	18.7	5.0	18.0		5.0	18.3	18.3	5.0	18.3	18.3
90th %ile Term Code	Max	Max	Max	Max	Max		Max	Max	Max	Max	Hold	Hold
70th %ile Green (s)	5.7	18.7	18.7	5.0	18.0		5.0	19.0	19.0	0.0	9.5	9.5
70th %ile Term Code	Max	Max	Max	Max	Hold		Max	Hold	Hold	Skip	Gap	Gap
50th %ile Green (s)	5.7	22.5	22.5	0.0	12.3		5.0	17.8	17.8	0.0	8.3	8.3
50th %ile Term Code	Max	Hold	Hold	Skip	Gap		Max	Hold	Hold	Skip	Gap	Gap
30th %ile Green (s)	5.7	20.4	20.4	0.0	10.2		0.0	14.4	14.4	0.0	14.4	14.4
30th %ile Term Code	Max	Hold	Hold	Skip	Gap		Skip	Gap	Gap	Skip	Hold	Hold
10th %ile Green (s)	5.7	17.6	17.6	0.0	7.4		0.0	10.9	10.9	0.0	10.9	10.9
10th %ile Term Code	Max	Hold	Hold	Skip	Gap		Skip	Gap	Gap	Skip	Hold	Hold
Queue Length 50th (ft)	60	77	0	6	61		16	82	0	3	23	0
Queue Length 95th (ft)	#225	#282	0	24	148		38	166	14	13	47	24
Internal Link Dist (ft)		728			771			2957			3512	
Turn Bay Length (ft)	300		300	300			400		400	300		300
Base Capacity (vph)	440	739	709	393	640		435	1304	703	214	1124	662
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.56	0.08	0.10	0.42		0.19	0.54	0.19	0.07	0.16	0.23
Intersection Summary												

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 50.4

Natural Cycle: 65

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 17.8

Intersection LOS: B

Intersection Capacity Utilization 66.8%

ICU Level of Service C

Analysis Period (min) 15

90th %ile Actuated Cycle: 65

70th %ile Actuated Cycle: 56.2

50th %ile Actuated Cycle: 49.3









30th %ile Actuated Cycle: 43.8








10th %ile Actuated Cycle: 37.5

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 10: Cascade Palmetto Hwy/Fulton Ind. Blvd. & Campbellton Rd.

 Ø1	 Ø2	 Ø3	 Ø4
9.5 s	22.8 s	9.5 s	23.2 s
 Ø5	 Ø6	 Ø7	 Ø8
9.5 s	22.8 s	10.2 s	22.5 s

Intersection							
Int Delay, s/veh	2.4						
Movement	SEL	SER	NEL	NET	SWU	SWT	SWR
Lane Configurations							
Traffic Vol, veh/h	40	19	37	1125	4	412	48
Future Vol, veh/h	40	19	37	1125	4	412	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	-	Yield
Storage Length	0	100	150	-	150	-	150
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	57	57	96	96	86	86	86
Heavy Vehicles, %	33	37	24	4	0	14	15
Mvmt Flow	70	33	39	1172	5	479	56








Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1151	240	479
Stage 1	488	-	-
Stage 2	663	-	-
Critical Hdwy	7.46	7.64	4.58
Critical Hdwy Stg 1	6.46	-	-
Critical Hdwy Stg 2	6.46	-	-
Follow-up Hdwy	3.83	3.67	2.44
Pot Cap-1 Maneuver	150	664	939
Stage 1	502	-	-
Stage 2	399	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	144	664	939
Mov Cap-2 Maneuver	144	-	-
Stage 1	502	-	-
Stage 2	382	-	-

Approach	SE	NE	SW
HCM Control Delay, s	38.5	0.3	0.1
HCM LOS	E		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SELn2	SWU	SWT	SWR
Capacity (veh/h)	939	-	144	664	418	-	-
HCM Lane V/C Ratio	0.041	-	0.487	0.05	0.011	-	-
HCM Control Delay (s)	9	-	51.7	10.7	13.7	-	-
HCM Lane LOS	A	-	F	B	B	-	-
HCM 95th %tile Q(veh)	0.1	-	2.3	0.2	0	-	-

HCM-2010 Report - Unsignalized Intersections
25: Fulton Industrial Blvd. & Westgate Pkwy (N)

Existing 2021 - AM
06/27/2021

Intersection							
Int Delay, s/veh	46.7						
Movement	SEL	SER	NEL	NET	SWU	SWT	SWR
Lane Configurations							
Traffic Vol, veh/h	79	45	46	1449	3	451	92
Future Vol, veh/h	79	45	46	1449	3	451	92
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	-	Free
Storage Length	0	0	300	-	250	-	300
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	41	41	91	91	92	92	92
Heavy Vehicles, %	34	18	9	4	0	12	35
Mvmt Flow	193	110	51	1592	3	490	100

Major/Minor	Minor2	Major1	Major2				
Conflicting Flow All	1394	245	490	0	1162	-	0
Stage 1	497	-	-	-	-	-	-
Stage 2	897	-	-	-	-	-	-
Critical Hdwy	7.48	7.26	4.28	-	6.4	-	-
Critical Hdwy Stg 1	6.48	-	-	-	-	-	-
Critical Hdwy Stg 2	6.48	-	-	-	-	-	-
Follow-up Hdwy	3.84	3.48	2.29	-	2.5	-	-
Pot Cap-1 Maneuver	~ 99	709	1022	-	266	-	0
Stage 1	494	-	-	-	-	-	0
Stage 2	290	-	-	-	-	-	0
Platoon blocked, %				-		-	
Mov Cap-1 Maneuver	~ 94	709	1022	-	266	-	-
Mov Cap-2 Maneuver	~ 94	-	-	-	-	-	-
Stage 1	494	-	-	-	-	-	-
Stage 2	276	-	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	374.4	0.3	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SELn2	SWU	SWT
Capacity (veh/h)	1022	-	94	709	266	-
HCM Lane V/C Ratio	0.049	-	2.05	0.155	0.012	-
HCM Control Delay (s)	8.7	-	\$ 581.4	11	18.7	-
HCM Lane LOS	A	-	F	B	C	-
HCM 95th %tile Q(veh)	0.2	-	16.7	0.5	0	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM-2010 Report - Unsignalized Intersections
 30: Fulton Industrial Blvd. & Riverside Dr./Tradewater Pkwy

Existing 2021 - AM
 06/27/2021

Intersection												
Int Delay, s/veh	20.5											
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕	↕		↕		↕	↕↕	↕	↕	↕↕	↕
Traffic Vol, veh/h	38	16	33	39	22	54	74	820	24	22	464	61
Future Vol, veh/h	38	16	33	39	22	54	74	820	24	22	464	61
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	300	-	200	300	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	81	81	81	89	89	89	97	97	97
Heavy Vehicles, %	35	0	42	8	0	4	10	12	21	0	20	25
Mvmt Flow	49	21	42	48	27	67	83	921	27	23	478	63

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1165	1612	239	1383	1612	461	478	0	0	921	0	0
Stage 1	524	524	-	1088	1088	-	-	-	-	-	-	-
Stage 2	641	1088	-	295	524	-	-	-	-	-	-	-
Critical Hdwy	8.2	6.5	7.74	7.66	6.5	6.98	4.3	-	-	4.1	-	-
Critical Hdwy Stg 1	7.2	5.5	-	6.66	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.2	5.5	-	6.66	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.85	4	3.72	3.58	4	3.34	2.3	-	-	2.2	-	-
Pot Cap-1 Maneuver	115	105	653	98	105	542	1026	-	-	750	-	-
Stage 1	428	533	-	220	294	-	-	-	-	-	-	-
Stage 2	358	294	-	672	533	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	72	94	653	70	94	542	1026	-	-	750	-	-
Mov Cap-2 Maneuver	72	94	-	70	94	-	-	-	-	-	-	-
Stage 1	393	517	-	202	270	-	-	-	-	-	-	-
Stage 2	260	270	-	585	517	-	-	-	-	-	-	-





















Approach	SE		NW		NE		SW	
HCM Control Delay, s	108.7		175.3		0.7		0.4	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NEL	NET	NERNWLn1	SELn1	SELn2	SWL	SWT	SWR
Capacity (veh/h)	1026	-	-	129	77	653	750	-
HCM Lane V/C Ratio	0.081	-	-	1.101	0.899	0.065	0.03	-
HCM Control Delay (s)	8.8	-	-	175.3	168.4	10.9	10	-
HCM Lane LOS	A	-	-	F	F	B	A	-
HCM 95th %tile Q(veh)	0.3	-	-	8.2	4.6	0.2	0.1	-

Synchro Report - Signalized Intersections
60: Fulton Ind. Blvd. & Boat Rock Blvd./Boat Rock Rd.

Existing 2021 - AM

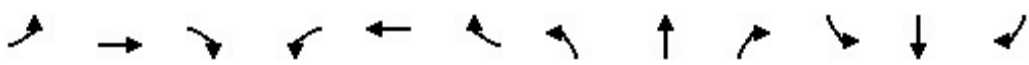
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	71	50	50	36	50	100	676	50	126	798	100
Future Volume (vph)	100	71	50	50	36	50	100	676	50	126	798	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	300		150
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.938			0.950			0.990				0.850
Flt Protected	0.950				0.982		0.950			0.950		
Satd. Flow (prot)	1128	1114	0	0	1477	0	1128	2978	0	1504	3008	897
Flt Permitted	0.555				0.832		0.206			0.252		
Satd. Flow (perm)	659	1114	0	0	1251	0	245	2978	0	399	3008	897
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		54			40			12				164
Link Speed (mph)		30			30			30				30
Link Distance (ft)		812			1105			708				889
Travel Time (s)		18.5			25.1			16.1				20.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	60%	60%	60%	20%	20%	20%	60%	20%	20%	20%	20%	80%
Adj. Flow (vph)	109	77	54	54	39	54	109	735	54	137	867	109
Shared Lane Traffic (%)												
Lane Group Flow (vph)	109	131	0	0	147	0	109	789	0	137	867	109
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	

Synchro Report - Signalized Intersections
60: Fulton Ind. Blvd. & Boat Rock Blvd./Boat Rock Rd.

Existing 2021 - AM

08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	22.5
Total Split (s)	9.6	32.1		22.5	22.5		10.0	28.1		9.8	27.9	27.9
Total Split (%)	13.7%	45.9%		32.1%	32.1%		14.3%	40.1%		14.0%	39.9%	39.9%
Maximum Green (s)	5.1	27.6		18.0	18.0		5.5	23.6		5.3	23.4	23.4
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Min		Min	Min		None	Min		None	Min	Min
Walk Time (s)		7.0		7.0	7.0			7.0			7.0	7.0
Flash Dont Walk (s)		11.0		11.0	11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)		0		0	0			0			0	0
Act Effect Green (s)	17.7	17.7			10.9		25.5	21.6		25.2	21.5	21.5
Actuated g/C Ratio	0.31	0.31			0.19		0.45	0.38		0.45	0.38	0.38
v/c Ratio	0.43	0.34			0.54		0.52	0.69		0.46	0.76	0.25
Control Delay	21.4	12.6			25.7		22.1	20.4		15.3	23.2	2.6
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	21.4	12.6			25.7		22.1	20.4		15.3	23.2	2.6
LOS	C	B			C		C	C		B	C	A
Approach Delay		16.6			25.7			20.6			20.2	
Approach LOS		B			C			C			C	
90th %ile Green (s)	5.1	26.6		17.0	17.0		5.5	23.6		5.3	23.4	23.4
90th %ile Term Code	Max	Hold		Gap	Gap		Max	Max		Max	Max	Max
70th %ile Green (s)	5.1	22.7		13.1	13.1		5.5	23.6		5.3	23.4	23.4
70th %ile Term Code	Max	Hold		Gap	Gap		Max	Max		Max	Max	Max
50th %ile Green (s)	5.1	20.2		10.6	10.6		5.5	23.6		5.3	23.4	23.4
50th %ile Term Code	Max	Hold		Gap	Gap		Max	Hold		Max	Max	Max
30th %ile Green (s)	5.1	17.9		8.3	8.3		5.5	23.0		5.3	22.8	22.8
30th %ile Term Code	Max	Hold		Gap	Gap		Max	Hold		Max	Gap	Gap
10th %ile Green (s)	0.0	5.5		5.5	5.5		0.0	11.7		0.0	11.7	11.7
10th %ile Term Code	Skip	Gap		Gap	Gap		Skip	Hold		Skip	Gap	Gap
Queue Length 50th (ft)	31	21			37		20	127		24	147	0
Queue Length 95th (ft)	65	57			88		#70	217		61	#277	13
Internal Link Dist (ft)		732			1025			628			809	
Turn Bay Length (ft)							300			300		150
Base Capacity (vph)	254	632			479		208	1422		295	1418	509
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.43	0.21			0.31		0.52	0.55		0.46	0.61	0.21








Intersection Summary

Synchro Report - Signalized Intersections
 60: Fulton Ind. Blvd. & Boat Rock Blvd./Boat Rock Rd.

Existing 2021 - AM
 08/06/2021
























Area Type:	Other
Cycle Length:	70
Actuated Cycle Length:	56.5
Natural Cycle:	70
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.76
Intersection Signal Delay:	20.3
Intersection LOS:	C
Intersection Capacity Utilization	57.1%
ICU Level of Service	B
Analysis Period (min)	15
90th %ile Actuated Cycle:	69
70th %ile Actuated Cycle:	65.1
50th %ile Actuated Cycle:	62.6
30th %ile Actuated Cycle:	59.7
10th %ile Actuated Cycle:	26.2
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 60: Fulton Ind. Blvd. & Boat Rock Blvd./Boat Rock Rd.

 Ø1	 Ø2	 Ø4
9.8 s	28.1 s	32.1 s
 Ø5	 Ø6	 Ø7
10 s	27.9 s	9.6 s
		 Ø8
		22.5 s

Synchro Report - Signalized Intersection 30:
Lakeview Ct. & Fulton Ind. Blvd













Existing 2021 - AM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	946	6	25	1020	31	2	0	18	41	0	2
Future Volume (vph)	16	946	6	25	1020	31	2	0	18	41	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	300		300	0		0	0		0
Storage Lanes	1		1	1		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.850	
Flt Protected	0.950			0.950				0.950		0.950		
Satd. Flow (prot)	1421	3167	1615	1556	3167	1091	0	1203	1380	1026	1077	0
Flt Permitted	0.139			0.238						0.615		
Satd. Flow (perm)	208	3167	1615	390	3167	1091	0	1267	1380	664	1077	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			127			127		217	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		849			1099			609			533	
Travel Time (s)		19.3			25.0			13.8			12.1	
Peak Hour Factor	0.93	0.93	0.93	0.72	0.72	0.72	0.83	0.83	0.83	0.84	0.84	0.84
Heavy Vehicles (%)	27%	14%	0%	16%	14%	48%	50%	0%	17%	76%	2%	50%
Adj. Flow (vph)	17	1017	6	35	1417	43	2	0	22	49	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	1017	6	35	1417	43	0	2	22	49	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	

Synchro Report - Signalized Intersection 30:
Lakeview Ct. & Fulton Ind. Blvd

Existing 2021 - AM

08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	
Total Split (s)	9.5	48.5	48.5	9.5	48.5	48.5	9.5	22.5	22.5	9.5	22.5	
Total Split (%)	10.6%	53.9%	53.9%	10.6%	53.9%	53.9%	10.6%	25.0%	25.0%	10.6%	25.0%	
Maximum Green (s)	5.0	44.0	44.0	5.0	44.0	44.0	5.0	18.0	18.0	5.0	18.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effect Green (s)	42.8	43.8	43.8	43.5	45.4	45.4		6.2	6.2	8.9	9.2	
Actuated g/C Ratio	0.75	0.76	0.76	0.76	0.79	0.79		0.11	0.11	0.16	0.16	
v/c Ratio	0.06	0.42	0.00	0.09	0.56	0.05		0.01	0.08	0.36	0.01	
Control Delay	4.4	7.5	0.0	4.2	7.8	0.1		31.5	0.6	32.3	0.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	4.4	7.5	0.0	4.2	7.8	0.1		31.5	0.6	32.3	0.0	
LOS	A	A	A	A	A	A		C	A	C	A	
Approach Delay		7.4			7.5			3.2			31.0	
Approach LOS		A			A			A			C	
90th %ile Green (s)	5.0	44.0	44.0	5.0	44.0	44.0	0.0	6.5	6.5	5.0	16.0	
90th %ile Term Code	Max	Hold	Hold	Max	Max	Max	Skip	Gap	Gap	Max	Hold	
70th %ile Green (s)	0.0	34.5	34.5	5.0	44.0	44.0	0.0	6.0	6.0	5.0	15.5	
70th %ile Term Code	Skip	Hold	Hold	Max	Max	Max	Skip	Gap	Gap	Max	Hold	
50th %ile Green (s)	0.0	45.2	45.2	0.0	45.2	45.2	0.0	0.0	0.0	5.5	5.5	
50th %ile Term Code	Skip	Dwell	Dwell	Skip	Dwell	Dwell	Skip	Skip	Skip	Hold	Hold	
30th %ile Green (s)	0.0	37.7	37.7	0.0	37.7	37.7	0.0	0.0	0.0	0.0	0.0	
30th %ile Term Code	Skip	Dwell	Dwell	Skip	Dwell	Dwell	Skip	Skip	Skip	Skip	Skip	
10th %ile Green (s)	0.0	33.2	33.2	0.0	33.2	33.2	0.0	0.0	0.0	0.0	0.0	
10th %ile Term Code	Skip	Dwell	Dwell	Skip	Dwell	Dwell	Skip	Skip	Skip	Skip	Skip	
Queue Length 50th (ft)	1	46	0	2	80	0		1	0	17	0	
Queue Length 95th (ft)	8	211	0	10	236	0		7	0	47	0	
Internal Link Dist (ft)		769			1019			529			453	
Turn Bay Length (ft)	300		300	300		300						
Base Capacity (vph)	269	2508	1305	406	2508	890		430	552	137	508	
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Reduced v/c Ratio	0.06	0.41	0.00	0.09	0.56	0.05		0.00	0.04	0.36	0.00	

Intersection Summary

Synchro Report - Signalized Intersection 70:
Lakeview Ct. & Fulton Ind. Blvd

Existing 2021 - AM
08/06/2021

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 57.3

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 7.8

Intersection LOS: A

Intersection Capacity Utilization 45.7%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 78.5

70th %ile Actuated Cycle: 68.5

50th %ile Actuated Cycle: 59.7

30th %ile Actuated Cycle: 42.2

























10th %ile Actuated Cycle: 37.7

Splits and Phases: 70: Lakeview Ct. & Fulton Ind. Blvd



Synchro Report - Signalized Intersection 80:
Fulton Ind. Blvd & Camp Creek Pkwy













Existing 2021 - AM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	888	100	67	591	230	300	363	100	85	300	185
Future Volume (vph)	139	888	100	67	591	230	300	363	100	85	300	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	350		300	350		300	300		300
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	4550	1417	3072	3167	1417	2334	2407	1077	2334	2407	1077
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	4550	1417	3072	3167	1417	2334	2407	1077	2334	2407	1077
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			164			250			164			203
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1099			761			631			649	
Travel Time (s)		25.0			17.3			14.3			14.8	
Peak Hour Factor	0.83	0.88	0.88	0.70	0.94	0.92	0.94	0.94	0.94	0.91	0.91	0.91
Heavy Vehicles (%)	14%	14%	14%	14%	14%	14%	50%	50%	50%	50%	50%	50%
Adj. Flow (vph)	167	1009	114	96	629	250	319	386	106	93	330	203
Shared Lane Traffic (%)												
Lane Group Flow (vph)	167	1009	114	96	629	250	319	386	106	93	330	203
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	

Synchro Report - Signalized Intersection 80:
Fulton Ind. Blvd & Camp Creek Pkwy

Existing 2021 - AM

08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6			8			4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	9.5	22.9	22.9	9.5	22.9	22.9	15.1	25.9	25.9	11.7	22.5	22.5
Total Split (%)	13.6%	32.7%	32.7%	13.6%	32.7%	32.7%	21.6%	37.0%	37.0%	16.7%	32.1%	32.1%
Maximum Green (s)	5.0	18.4	18.4	5.0	18.4	18.4	10.6	21.4	21.4	7.2	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	5.0	19.5	19.5	5.0	17.3	17.3	10.7	20.5	20.5	6.8	14.3	14.3
Actuated g/C Ratio	0.08	0.30	0.30	0.08	0.26	0.26	0.16	0.31	0.31	0.10	0.22	0.22
v/c Ratio	0.71	0.74	0.21	0.41	0.75	0.45	0.84	0.51	0.24	0.38	0.63	0.52
Control Delay	49.8	26.6	2.6	36.1	29.3	6.1	50.2	22.6	2.5	33.8	29.0	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.8	26.6	2.6	36.1	29.3	6.1	50.2	22.6	2.5	33.8	29.0	8.9
LOS	D	C	A	D	C	A	D	C	A	C	C	A
Approach Delay	27.4			24.0			30.8			23.2		
Approach LOS	C			C			C			C		
90th %ile Green (s)	5.0	18.4	18.4	5.0	18.4	18.4	10.6	21.4	21.4	7.2	18.0	18.0
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max
70th %ile Green (s)	5.0	18.4	18.4	5.0	18.4	18.4	10.6	21.4	21.4	7.2	18.0	18.0
70th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Hold	Hold	Max	Max	Max
50th %ile Green (s)	5.0	18.4	18.4	5.0	18.4	18.4	10.6	18.5	18.5	7.2	15.1	15.1
50th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Hold	Hold	Max	Gap	Gap
30th %ile Green (s)	5.0	18.4	18.4	5.0	18.4	18.4	10.6	15.8	15.8	6.9	12.1	12.1
30th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Hold	Hold	Gap	Gap	Gap
10th %ile Green (s)	5.0	22.7	22.7	0.0	13.2	13.2	10.6	24.2	24.2	0.0	9.1	9.1
10th %ile Term Code	Max	Hold	Hold	Skip	Gap	Gap	Max	Hold	Hold	Skip	Gap	Gap
Queue Length 50th (ft)	35	140	0	20	122	0	67	71	0	18	64	0
Queue Length 95th (ft)	#73	#197	15	32	#188	50	#141	112	12	41	103	49
Internal Link Dist (ft)	1019			681			551			569		
Turn Bay Length (ft)	300		300	350		300	350		300	300		300
Base Capacity (vph)	236	1358	538	236	897	580	380	816	474	258	666	445
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.74	0.21	0.41	0.70	0.43	0.84	0.47	0.22	0.36	0.50	0.46

Intersection Summary

Synchro Report - Signalized Intersection 80: Fulton Ind. Blvd & Camp Creek Pkwy

Existing 2021 - AM
08/06/2021

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 65.4

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 26.6

Intersection LOS: C

Intersection Capacity Utilization 53.2%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 70

70th %ile Actuated Cycle: 70

50th %ile Actuated Cycle: 67.1









30th %ile Actuated Cycle: 64.1

10th %ile Actuated Cycle: 55.9

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 80: Fulton Ind. Blvd & Camp Creek Pkwy

























 Ø1	 Ø2	 Ø3	 Ø4
9.5 s	22.9 s	15.1 s	22.5 s
 Ø5	 Ø6	 Ø7	 Ø8
9.5 s	22.9 s	11.7 s	25.9 s













Synchro Report - Signalized Intersections

Existing 2021 - AM

100: Fulton Ind. Blvd/Fulton Ind. Blvd. & Cascade Rd./Great SW Pkwy

08/06/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	38	16	106	184	25	94	242	1970	188	82	711	20
Future Volume (vph)	38	16	106	184	25	94	242	1970	188	82	711	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		300	300		300
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1597	1727	1262	1597	1900	1538	1612	3252	1553	1671	3085	1468
Flt Permitted	0.738			0.547			0.313			0.053		
Satd. Flow (perm)	1241	1727	1262	920	1900	1538	531	3252	1553	93	3085	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			126			126			149			126
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			669			1465			1699	
Travel Time (s)		10.4			15.2			33.3			38.6	
Peak Hour Factor	0.87	0.87	0.87	0.83	0.83	0.83	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	13%	10%	28%	13%	0%	5%	12%	11%	4%	8%	17%	10%
Adj. Flow (vph)	44	18	122	222	30	113	252	2052	196	85	741	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	18	122	222	30	113	252	2052	196	85	741	21
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	9.6	22.5	22.5	11.8	24.7	24.7	22.0	86.2	86.2	9.5	73.7	73.7
Total Split (%)	7.4%	17.3%	17.3%	9.1%	19.0%	19.0%	16.9%	66.3%	66.3%	7.3%	56.7%	56.7%
Maximum Green (s)	5.1	18.0	18.0	7.3	20.2	20.2	17.5	81.7	81.7	5.0	69.2	69.2
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	12.9	7.8	7.8	17.8	12.0	12.0	91.0	81.8	81.8	80.8	75.8	75.8
Actuated g/C Ratio	0.11	0.07	0.07	0.15	0.10	0.10	0.76	0.68	0.68	0.67	0.63	0.63
v/c Ratio	0.30	0.16	0.61	1.25	0.16	0.42	0.50	0.93	0.18	0.66	0.38	0.02
Control Delay	48.6	55.5	22.0	192.5	52.6	11.9	8.0	25.6	2.5	44.0	12.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.6	55.5	22.0	192.5	52.6	11.9	8.0	25.6	2.5	44.0	12.0	0.1
LOS	D	E	C	F	D	B	A	C	A	D	B	A
Approach Delay		31.7			125.1			22.0			14.9	
Approach LOS		C			F			C			B	
90th %ile Green (s)	5.1	13.1	13.1	7.3	15.3	15.3	15.2	81.7	81.7	5.0	71.5	71.5
90th %ile Term Code	Max	Gap	Gap	Max	Hold	Hold	Gap	Max	Max	Max	Hold	Hold
70th %ile Green (s)	5.1	8.2	8.2	7.3	10.4	10.4	12.0	81.7	81.7	5.0	74.7	74.7
70th %ile Term Code	Max	Gap	Gap	Max	Hold	Hold	Gap	Max	Max	Max	Hold	Hold
50th %ile Green (s)	5.1	6.7	6.7	7.3	8.9	8.9	10.5	81.7	81.7	5.0	76.2	76.2
50th %ile Term Code	Max	Gap	Gap	Max	Hold	Hold	Gap	Max	Max	Max	Hold	Hold
30th %ile Green (s)	5.1	5.8	5.8	7.3	8.0	8.0	9.4	81.7	81.7	5.0	77.3	77.3
30th %ile Term Code	Max	Gap	Gap	Max	Hold	Hold	Gap	Max	Max	Max	Hold	Hold
10th %ile Green (s)	0.0	5.5	5.5	7.3	17.3	17.3	8.0	81.7	81.7	5.0	78.7	78.7
10th %ile Term Code	Skip	Gap	Gap	Max	Hold	Hold	Gap	Max	Max	Max	Hold	Hold
Queue Length 50th (ft)	30	13	0	~165	22	0	45	631	10	15	130	0
Queue Length 95th (ft)	62	36	50	#320	49	34	88	#1014	40	#104	215	0
Internal Link Dist (ft)		378			589			1385			1619	
Turn Bay Length (ft)							300		300	300		300
Base Capacity (vph)	148	259	296	177	320	364	562	2217	1106	128	1950	974
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.07	0.41	1.25	0.09	0.31	0.45	0.93	0.18	0.66	0.38	0.02

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 119.9

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.25

Intersection Signal Delay: 30.6

Intersection LOS: C

Intersection Capacity Utilization 87.1%

ICU Level of Service E

Analysis Period (min) 15

90th %ile Actuated Cycle: 125.1

70th %ile Actuated Cycle: 120.2

50th %ile Actuated Cycle: 118.7

30th %ile Actuated Cycle: 117.8

10th %ile Actuated Cycle: 117.5









~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 100: Fulton Ind. Blvd/Fulton Ind. Blvd. & Cascade Rd./Great SW Pkwy

 Ø1	 Ø2	 Ø3	 Ø4
9.5 s	86.2 s	11.8 s	22.5 s
 Ø5	 Ø6	 Ø7	 Ø8
22 s	73.7 s	9.6 s	24.7 s

Intersection												
Int Delay, s/veh	8.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	6	0	10	11	1	68	73	1301	49	121	816	39
Future Vol, veh/h	6	0	10	11	1	68	73	1301	49	121	816	39
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	0	300	-	300	250	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	88	88	88	97	97	97	80	80	80
Heavy Vehicles, %	17	0	60	18	0	29	4	12	10	9	16	28
Mvmt Flow	10	0	16	13	1	77	75	1341	51	151	1020	49

Major/Minor	Minor2		Minor1		Major1		Major2		Major2		Major2	
Conflicting Flow All	2145	2815	510	2305	2815	671	1020	0	-	1341	0	0
Stage 1	1323	1323	-	1492	1492	-	-	-	-	-	-	-
Stage 2	822	1492	-	813	1323	-	-	-	-	-	-	-
Critical Hdwy	7.84	6.5	8.1	7.86	6.5	7.48	4.18	-	-	4.28	-	-
Critical Hdwy Stg 1	6.84	5.5	-	6.86	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.84	5.5	-	6.86	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4	3.9	3.68	4	3.59	2.24	-	-	2.29	-	-
Pot Cap-1 Maneuver	23	18	381	17	18	341	664	-	0	474	-	-
Stage 1	145	228	-	111	189	-	-	-	0	-	-	-
Stage 2	304	189	-	306	228	-	-	-	0	-	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	11	11	381	~ 11	11	341	664	-	-	474	-	-
Mov Cap-2 Maneuver	11	11	-	~ 11	11	-	-	-	-	-	-	-
Stage 1	129	155	-	98	168	-	-	-	-	-	-	-
Stage 2	207	168	-	200	155	-	-	-	-	-	-	-






















Approach	EB	WB	NB	SB
HCM Control Delay, s	342.7	138.3	0.6	2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	664	-	28	11	341	474	-	-
HCM Lane V/C Ratio	0.113	-	0.907	1.24	0.227	0.319	-	-
HCM Control Delay (s)	11.1	-	\$ 342.7	\$ 816.9	18.6	16.1	-	-
HCM Lane LOS	B	-	F	F	C	C	-	-
HCM 95th %tile Q(veh)	0.4	-	2.9	2.4	0.9	1.4	-	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon













Syncro Report - Signalized Intersections
130: Great SW Pkwy

Existing 2021 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	762	0	100	1570	0	0	9	0	0	59	0
Future Volume (vph)	100	762	0	100	1570	0	0	9	0	0	59	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		250	300		300	0		0	0		0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Frt												
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1570	3139	1652	1570	3139	1652	0	2407	0	0	2407	0
Flt Permitted	0.070			0.270								
Satd. Flow (perm)	116	3139	1652	446	3139	1652	0	2407	0	0	2407	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		642			731			251			574	
Travel Time (s)		14.6			16.6			5.7			13.0	
Peak Hour Factor	0.92	0.80	0.92	0.92	0.80	0.92	0.92	0.45	0.92	0.87	0.87	0.92
Heavy Vehicles (%)	15%	15%	15%	15%	15%	15%	50%	50%	50%	50%	50%	50%
Adj. Flow (vph)	109	953	0	109	1963	0	0	20	0	0	68	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	109	953	0	109	1963	0	0	20	0	0	68	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm		NA			NA	
Protected Phases	5	2		1	6			8			4	

Syncro Report - Signalized Intersections
130: Great SW Pkwy

Existing 2021 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2	6		6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5		22.5	22.5	
Total Split (s)	9.5	56.1	56.1	11.4	58.0	58.0	22.5	22.5		22.5	22.5	
Total Split (%)	10.6%	62.3%	62.3%	12.7%	64.4%	64.4%	25.0%	25.0%		25.0%	25.0%	
Maximum Green (s)	5.0	51.6	51.6	6.9	53.5	53.5	18.0	18.0		18.0	18.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5			4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0		0	0	
Act Effect Green (s)	61.0	57.8		62.9	56.4			7.6			7.6	
Actuated g/C Ratio	0.76	0.72		0.78	0.70			0.09			0.09	
v/c Ratio	0.62	0.42		0.25	0.89			0.09			0.30	
Control Delay	28.9	7.1		3.5	18.3			33.3			36.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	28.9	7.1		3.5	18.3			33.3			36.8	
LOS	C	A		A	B			C			D	
Approach Delay		9.4			17.5			33.3			36.8	
Approach LOS		A			B			C			D	
90th %ile Green (s)	5.0	51.6	51.6	6.9	53.5	53.5	9.9	9.9		9.9	9.9	
90th %ile Term Code	Max	Hold	Hold	Max	Max	Max	Hold	Hold		Gap	Gap	
70th %ile Green (s)	5.0	51.6	51.6	6.9	53.5	53.5	8.5	8.5		8.5	8.5	
70th %ile Term Code	Max	Hold	Hold	Max	Max	Max	Hold	Hold		Gap	Gap	
50th %ile Green (s)	5.0	51.8	51.8	6.7	53.5	53.5	7.6	7.6		7.6	7.6	
50th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Hold	Hold		Gap	Gap	
30th %ile Green (s)	5.0	52.3	52.3	6.2	53.5	53.5	6.7	6.7		6.7	6.7	
30th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Hold	Hold		Gap	Gap	
10th %ile Green (s)	5.0	78.0	78.0	0.0	68.5	68.5	0.0	0.0		0.0	0.0	
10th %ile Term Code	Max	Dwell	Dwell	Skip	Dwell	Dwell	Skip	Skip		Skip	Skip	
Queue Length 50th (ft)	10	109		9	385			4			16	
Queue Length 95th (ft)	#85	136		21	425			7			35	
Internal Link Dist (ft)		562			651			171			494	
Turn Bay Length (ft)	300			300								
Base Capacity (vph)	177	2251		446	2197			537			537	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.62	0.42		0.24	0.89			0.04			0.13	

Intersection Summary

Syncro Report - Signalized Intersections
130: Great SW Pkwy

Existing 2021 - AM
06/27/2021

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 80.6

Natural Cycle: 90

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 15.4

Intersection LOS: B

Intersection Capacity Utilization 64.4%

ICU Level of Service C

Analysis Period (min) 15

90th %ile Actuated Cycle: 81.9

70th %ile Actuated Cycle: 80.5

50th %ile Actuated Cycle: 79.6

30th %ile Actuated Cycle: 78.7

10th %ile Actuated Cycle: 82.5

95th percentile volume exceeds capacity, queue may be longer.












Queue shown is maximum after two cycles.

Splits and Phases: 130: Great SW Pkwy









Syncro Report - Signalized Intersections
140: Bakers Ferry Rd.

Existing 2021 - AM
06/27/2021

						
Lane Group	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	69	24	1236	72	47	1181
Future Volume (vph)	69	24	1236	72	47	1181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		300	300	
Storage Lanes	1	0		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	0.965			0.850		
Flt Protected	0.964				0.950	
Satd. Flow (prot)	1544	0	3112	1524	1570	3112
Flt Permitted	0.964				0.137	
Satd. Flow (perm)	1544	0	3112	1524	226	3112
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	27			75		
Link Speed (mph)	30		30			30
Link Distance (ft)	676		615			670
Travel Time (s)	15.4		14.0			15.2
Peak Hour Factor	0.75	0.75	0.96	0.96	0.70	0.70
Heavy Vehicles (%)	15%	13%	16%	6%	15%	16%
Adj. Flow (vph)	92	32	1288	75	67	1687
Shared Lane Traffic (%)						
Lane Group Flow (vph)	124	0	1288	75	67	1687
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (ft)	20		100	20	20	100
Trailing Detector (ft)	0		0	0	0	0
Detector 1 Position(ft)	0		0	0	0	0
Detector 1 Size(ft)	20		6	20	20	6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6

Syncro Report - Signalized Intersections
140: Bakers Ferry Rd.

Existing 2021 - AM
06/27/2021

						
Lane Group	NBL	NBR	NET	NER	SWL	SWT
Permitted Phases				2	6	
Detector Phase	8		2	2	1	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	9.5	22.5
Total Split (s)	22.5		33.0	33.0	9.5	42.5
Total Split (%)	34.6%		50.8%	50.8%	14.6%	65.4%
Maximum Green (s)	18.0		28.5	28.5	5.0	38.0
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Min	Min	None	Min
Walk Time (s)	7.0		7.0	7.0		7.0
Flash Dont Walk (s)	11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)	0		0	0		0
Act Effect Green (s)	9.1		36.6	36.6	41.0	42.2
Actuated g/C Ratio	0.16		0.65	0.65	0.72	0.75
v/c Ratio	0.46		0.64	0.07	0.24	0.73
Control Delay	23.5		12.7	2.8	5.6	9.4
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	23.5		12.7	2.8	5.6	9.4
LOS	C		B	A	A	A
Approach Delay	23.5		12.2			9.2
Approach LOS	C		B			A
90th %ile Green (s)	13.1		28.5	28.5	5.0	38.0
90th %ile Term Code	Gap		Max	Max	Max	Max
70th %ile Green (s)	10.5		28.5	28.5	5.0	38.0
70th %ile Term Code	Gap		Max	Max	Max	Max
50th %ile Green (s)	8.8		28.5	28.5	5.0	38.0
50th %ile Term Code	Gap		Max	Max	Max	Max
30th %ile Green (s)	7.7		50.9	50.9	0.0	50.9
30th %ile Term Code	Gap		Dwell	Dwell	Skip	Dwell
10th %ile Green (s)	0.0		37.6	37.6	0.0	37.6
10th %ile Term Code	Skip		Dwell	Dwell	Skip	Dwell
Queue Length 50th (ft)	29		171	0	6	158
Queue Length 95th (ft)	55		#342	17	15	181
Internal Link Dist (ft)	596		535			590
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	521		2012	1012	285	2259
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.24		0.64	0.07	0.24	0.75
Intersection Summary						

Syncro Report - Signalized Intersections 140: Bakers Ferry Rd.

Existing 2021 - AM
06/27/2021

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 56.6

Natural Cycle: 65

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 11.0

Intersection LOS: B

Intersection Capacity Utilization 51.8%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 60.1

70th %ile Actuated Cycle: 57.5

50th %ile Actuated Cycle: 55.8

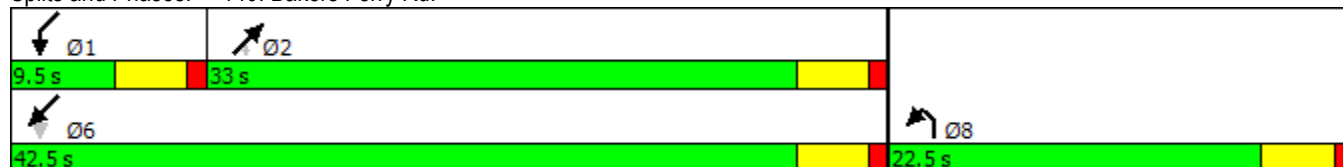
30th %ile Actuated Cycle: 67.6

10th %ile Actuated Cycle: 42.1

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.





















Splits and Phases: 140: Bakers Ferry Rd.



Syncro Report - Signalized Intersections
150: Mendel Dr./Wharton Dr.













Existing 2021 - AM

06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	35	7	7	13	7	26	29	1073	20	66	1329	152
Future Volume (vph)	35	7	7	13	7	26	29	1073	20	66	1329	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	300		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Frt		0.925			0.923			0.997			0.985	
Flt Protected	0.950				0.986		0.950			0.950		
Satd. Flow (prot)	1399	1643	0	0	1321	0	1687	4536	0	1467	4583	0
Flt Permitted	0.997				0.897		0.950			0.950		
Satd. Flow (perm)	1468	1643	0	0	1202	0	1687	4536	0	1467	4583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			34			4			38	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		409			537			753			584	
Travel Time (s)		9.3			12.2			17.1			13.3	
Peak Hour Factor	0.71	0.71	0.71	0.76	0.76	0.76	0.97	0.97	0.97	0.68	0.68	0.68
Heavy Vehicles (%)	29%	0%	14%	31%	0%	39%	7%	14%	15%	23%	12%	7%
Adj. Flow (vph)	49	10	10	17	9	34	30	1106	21	97	1954	224
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	20	0	0	60	0	30	1127	0	97	2178	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	

Syncro Report - Signalized Intersections
150: Mendel Dr./Wharton Dr.

Existing 2021 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	22.6	22.6		22.6	22.6		9.8	36.2		16.2	42.6	
Total Split (%)	30.1%	30.1%		30.1%	30.1%		13.1%	48.3%		21.6%	56.8%	
Maximum Green (s)	18.1	18.1		18.1	18.1		5.3	31.7		11.7	38.1	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effect Green (s)	8.3	8.3			8.1		5.4	40.4		8.9	45.4	
Actuated g/C Ratio	0.14	0.14			0.14		0.09	0.68		0.15	0.76	
v/c Ratio	0.24	0.08			0.31		0.20	0.37		0.45	0.62	
Control Delay	27.1	18.3			18.6		31.6	9.2		31.3	8.5	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	27.1	18.3			18.6		31.6	9.2		31.3	8.5	
LOS	C	B			B		C	A		C	A	
Approach Delay		24.5			18.6			9.8			9.5	
Approach LOS		C			B			A			A	
90th %ile Green (s)	12.4	12.4		12.4	12.4		5.3	31.7		11.7	38.1	
90th %ile Term Code	Gap	Gap		Hold	Hold		Max	Max		Max	Max	
70th %ile Green (s)	9.9	9.9		9.9	9.9		5.3	32.2		11.2	38.1	
70th %ile Term Code	Gap	Gap		Hold	Hold		Max	Hold		Gap	Max	
50th %ile Green (s)	8.0	8.0		8.0	8.0		0.0	24.6		9.0	38.1	
50th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Hold		Gap	Max	
30th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	51.0		0.0	51.0	
30th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Dwell		Skip	Dwell	
10th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	46.6		0.0	46.6	
10th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Dwell		Skip	Dwell	
Queue Length 50th (ft)	14	3			8		9	93		29	113	
Queue Length 95th (ft)	36	15			31		37	157		58	195	
Internal Link Dist (ft)		329			457			673			504	
Turn Bay Length (ft)							300			300		
Base Capacity (vph)	452	513			393		152	3190		292	3502	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.11	0.04			0.15		0.20	0.35		0.33	0.62	
Intersection Summary												

Syncro Report - Signalized Intersections
150: Mendel Dr./Wharton Dr.

Existing 2021 - AM
06/27/2021

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 59.6

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 10.0

Intersection LOS: B

Intersection Capacity Utilization 53.8%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 69.3

70th %ile Actuated Cycle: 66.8

50th %ile Actuated Cycle: 55.1

30th %ile Actuated Cycle: 55.5





















10th %ile Actuated Cycle: 51.1

Splits and Phases: 150: Mendel Dr./Wharton Dr.

 Ø1	 Ø2	 Ø4
16.2 s	36.2 s	22.6 s
 Ø5	 Ø6	 Ø8
9.8 s	42.6 s	22.6 s













Syncro Report - Signalized Intersections
160: Marvin Miller Dr.

Existing 2021 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	0	7	4	0	14	15	1225	11	9	1415	58
Future Volume (vph)	20	0	7	4	0	14	15	1225	11	9	1415	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		250	200		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Frt		0.966			0.927				0.850		0.994	
Flt Protected		0.964			0.978		0.950			0.950		
Satd. Flow (prot)	0	1414	0	0	1273	0	1687	4550	1404	1467	4612	0
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1466	0	0	1301	0	1687	4550	1404	1467	4612	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		94			94				94		12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		720			447			1232			950	
Travel Time (s)		16.4			10.2			28.0			21.6	
Peak Hour Factor	0.57	0.57	0.57	0.25	0.75	0.75	0.91	0.91	0.91	0.73	0.73	0.73
Heavy Vehicles (%)	29%	0%	14%	31%	0%	39%	7%	14%	15%	23%	12%	7%
Adj. Flow (vph)	35	0	12	16	0	19	16	1346	12	12	1938	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	47	0	0	35	0	16	1346	12	12	2017	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	
Protected Phases		4			8		5	2		1	6	

Syncro Report - Signalized Intersections
160: Marvin Miller Dr.

Existing 2021 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	4			8					2			
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5	22.5	9.5	22.5	
Total Split (s)	22.6	22.6		22.6	22.6		9.6	37.8	37.8	9.6	37.8	
Total Split (%)	32.3%	32.3%		32.3%	32.3%		13.7%	54.0%	54.0%	13.7%	54.0%	
Maximum Green (s)	18.1	18.1		18.1	18.1		5.1	33.3	33.3	5.1	33.3	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		None	Min	Min	Min	None	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	
Act Effect Green (s)		5.9			5.9		5.4	25.8	25.8	5.4	37.9	
Actuated g/C Ratio		0.13			0.13		0.12	0.59	0.59	0.12	0.86	
v/c Ratio		0.17			0.14		0.08	0.50	0.01	0.07	0.51	
Control Delay		3.4			1.2		23.5	6.6	0.0	23.6	4.1	
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		3.4			1.2		23.5	6.6	0.0	23.6	4.1	
LOS		A			A		C	A	A	C	A	
Approach Delay		3.4			1.2			6.7			4.2	
Approach LOS		A			A			A			A	
90th %ile Green (s)	6.2	6.2		6.2	6.2		5.1	33.3	33.3	5.1	33.3	
90th %ile Term Code	Gap	Gap		Hold	Hold		Max	Max	Max	Max	Max	
70th %ile Green (s)	5.5	5.5		5.5	5.5		0.0	30.3	30.3	5.1	39.9	
70th %ile Term Code	Gap	Gap		Gap	Gap		Skip	Gap	Gap	Max	Hold	
50th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	25.6	25.6	5.1	35.2	
50th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Gap	Gap	Max	Hold	
30th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	23.7	23.7	5.1	33.3	
30th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Hold	Hold	Max	Max	
10th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	15.8	15.8	5.1	25.4	
10th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Hold	Hold	Max	Gap	
Queue Length 50th (ft)		0			0		3	39	0	2	0	
Queue Length 95th (ft)		0			0		21	122	0	14	153	
Internal Link Dist (ft)		640			367			1152			870	
Turn Bay Length (ft)							250		250	200		
Base Capacity (vph)		693			621		207	3662	1148	180	3974	
Starvation Cap Reductn		0			0		0	0	0	0	0	
Spillback Cap Reductn		0			0		0	0	0	0	0	
Storage Cap Reductn		0			0		0	0	0	0	0	
Reduced v/c Ratio		0.07			0.06		0.08	0.37	0.01	0.07	0.51	
Intersection Summary												

Syncro Report - Signalized Intersections
160: Marvin Miller Dr.

Existing 2021 - AM
06/27/2021

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 44

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 5.2

Intersection LOS: A

Intersection Capacity Utilization 40.3%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 58.1

70th %ile Actuated Cycle: 54.4

50th %ile Actuated Cycle: 39.7

30th %ile Actuated Cycle: 37.8




















10th %ile Actuated Cycle: 29.9

Splits and Phases: 160: Marvin Miller Dr.

 Ø1	 Ø2	 Ø4
9.6 s	37.8 s	22.6 s
 Ø5	 Ø6	 Ø8
9.6 s	37.8 s	22.6 s













Syncro Report - Signalized Intersections
170: Patton Dr.

Existing 2021 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	51	0	0	527	0	175	2432	0	17	1647	0
Future Volume (vph)	0	51	0	0	527	0	175	2432	0	17	1647	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		0	300		0
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frt												
Flt Protected							0.950			0.950		
Satd. Flow (prot)	0	1863	0	0	1863	0	1770	5085	0	1770	5085	1863
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1863	0	0	1863	0	1770	5085	0	1770	5085	1863
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		749			928			950			975	
Travel Time (s)		17.0			21.1			21.6			22.2	
Peak Hour Factor	0.85	0.85	0.85	0.92	0.88	0.92	0.47	0.88	0.92	0.53	0.73	0.92
Adj. Flow (vph)	0	60	0	0	599	0	372	2764	0	32	2256	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	60	0	0	599	0	372	2764	0	32	2256	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA			NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6

Syncro Report - Signalized Intersections
170: Patton Dr.

Existing 2021 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	22.5
Total Split (s)	42.0	42.0		42.0	42.0		29.0	78.5		9.5	59.0	59.0
Total Split (%)	32.3%	32.3%		32.3%	32.3%		22.3%	60.4%		7.3%	45.4%	45.4%
Maximum Green (s)	37.5	37.5		37.5	37.5		24.5	74.0		5.0	54.5	54.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0			0	0
Act Effect Green (s)		37.5			37.5		24.5	77.8		5.0	54.5	
Actuated g/C Ratio		0.29			0.29		0.19	0.60		0.04	0.42	
v/c Ratio		0.11			1.12		1.12	0.91		0.47	1.06	
Control Delay		34.8			117.2		132.6	29.2		83.4	74.0	
Queue Delay		0.0			0.0		0.0	0.2		0.0	0.0	
Total Delay		34.8			117.2		132.6	29.5		83.4	74.0	
LOS		C			F		F	C		F	E	
Approach Delay		34.8			117.2			41.7			74.1	
Approach LOS		C			F			D			E	
90th %ile Green (s)	37.5	37.5		37.5	37.5		24.5	74.0		5.0	54.5	54.5
90th %ile Term Code	Hold	Hold		Max	Max		Max	Max		Max	Max	Max
70th %ile Green (s)	37.5	37.5		37.5	37.5		24.5	74.0		5.0	54.5	54.5
70th %ile Term Code	Hold	Hold		Max	Max		Max	Max		Max	Max	Max
50th %ile Green (s)	37.5	37.5		37.5	37.5		24.5	74.0		5.0	54.5	54.5
50th %ile Term Code	Hold	Hold		Max	Max		Max	Max		Max	Max	Max
30th %ile Green (s)	37.5	37.5		37.5	37.5		24.5	83.5		0.0	54.5	54.5
30th %ile Term Code	Hold	Hold		Max	Max		Max	Hold		Skip	Max	Max
10th %ile Green (s)	37.5	37.5		37.5	37.5		24.5	83.5		0.0	54.5	54.5
10th %ile Term Code	Hold	Hold		Max	Max		Max	Hold		Skip	Max	Max
Queue Length 50th (ft)		37			~578		~359	771		27	~763	
Queue Length 95th (ft)		69			#780		204	813		36	557	
Internal Link Dist (ft)		669			848			870			895	
Turn Bay Length (ft)							200			300		
Base Capacity (vph)		537			537		333	3043		68	2131	
Starvation Cap Reductn		0			0		0	30		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.11			1.12		1.12	0.92		0.47	1.06	

Intersection Summary







Area Type: Other

Syncro Report - Signalized Intersections 170: Patton Dr.

Existing 2021 - AM
06/27/2021

Cycle Length: 130
 Actuated Cycle Length: 130
 Natural Cycle: 130
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 61.3
 Intersection Capacity Utilization 90.1%
 Intersection LOS: E
 ICU Level of Service E
 Analysis Period (min) 15
 90th %ile Actuated Cycle: 130
 70th %ile Actuated Cycle: 130
 50th %ile Actuated Cycle: 130
 30th %ile Actuated Cycle: 130
 10th %ile Actuated Cycle: 130
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



















Splits and Phases: 170: Patton Dr.

 Ø1	 Ø2	 Ø4
9.5 s	78.5 s	42 s
 Ø5	 Ø6	 Ø8
29 s	59 s	42 s

Syncro Report - Signalized Intersections
180: Commerce Cir.













Existing 2021 - AM

06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	9	1311	4	84	1648	2	12	0	4	12	0	21
Future Volume (vph)	9	1311	4	84	1648	2	12	0	4	12	0	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Frt								0.968			0.915	
Flt Protected	0.950			0.950				0.963			0.982	
Satd. Flow (prot)	1504	4427	0	902	5684	0	0	1600	0	0	939	0
Flt Permitted	0.950			0.950							0.869	
Satd. Flow (perm)	1504	4427	0	902	5684	0	0	1661	0	0	831	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1						115			115	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		760			245			480			470	
Travel Time (s)		17.3			5.6			10.9			10.7	
Peak Hour Factor	0.95	0.95	0.95	0.79	0.79	0.79	0.77	0.77	0.77	0.72	0.72	0.72
Heavy Vehicles (%)	20%	17%	73%	100%	15%	9%	5%	0%	29%	100%	0%	71%
Adj. Flow (vph)	9	1380	4	106	2086	3	16	0	5	17	0	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	1384	0	106	2089	0	0	21	0	0	46	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	

Syncro Report - Signalized Intersections
180: Commerce Cir.

Existing 2021 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	9.5	48.0		29.0	67.5		23.0	23.0		23.0	23.0	
Total Split (%)	9.5%	48.0%		29.0%	67.5%		23.0%	23.0%		23.0%	23.0%	
Maximum Green (s)	5.0	43.5		24.5	63.0		18.5	18.5		18.5	18.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	6.2	68.1		16.9	88.9			5.5			5.5	
Actuated g/C Ratio	0.06	0.68		0.17	0.89			0.06			0.06	
v/c Ratio	0.10	0.46		0.70	0.41			0.10			0.30	
Control Delay	46.0	9.7		60.7	2.3			1.1			4.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	46.0	9.7		60.7	2.3			1.1			4.9	
LOS	D	A		E	A			A			A	
Approach Delay		9.9			5.1			1.1			4.9	
Approach LOS		A			A			A			A	
90th %ile Green (s)	7.5	55.7		25.3	73.5		5.5	5.5		5.5	5.5	
90th %ile Term Code	Gap	Coord		Gap	Coord		Gap	Gap		Gap	Gap	
70th %ile Green (s)	0.0	60.6		20.4	85.5		5.5	5.5		5.5	5.5	
70th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Gap	Gap	
50th %ile Green (s)	0.0	64.0		17.0	85.5		5.5	5.5		5.5	5.5	
50th %ile Term Code	Skip	Coord		Gap	Coord		Hold	Hold		Gap	Gap	
30th %ile Green (s)	0.0	77.5		13.5	95.5		0.0	0.0		0.0	0.0	
30th %ile Term Code	Skip	Coord		Gap	Coord		Skip	Skip		Skip	Skip	
10th %ile Green (s)	0.0	82.6		8.4	95.5		0.0	0.0		0.0	0.0	
10th %ile Term Code	Skip	Coord		Gap	Coord		Skip	Skip		Skip	Skip	
Queue Length 50th (ft)	6	153		62	43			0			0	
Queue Length 95th (ft)	22	238		114	91			0			0	
Internal Link Dist (ft)		680			165			400			390	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	93	3014		222	5053			401			247	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.10	0.46		0.48	0.41			0.05			0.19	
Intersection Summary												

Syncro Report - Signalized Intersections
180: Commerce Cir.

Existing 2021 - AM
06/27/2021

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 87 (87%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 6.9

Intersection LOS: A

Intersection Capacity Utilization 45.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 180: Commerce Cir.



Synchro Report - Unsignalized Intersections
190: Fulton Ind. Circle

Existing 2021 - AM
06/27/2021





























Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↑
Traffic Volume (vph)	0	1372	1717	33	0	17
Future Volume (vph)	0	1372	1717	33	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.86	0.86	0.86	1.00	1.00
Frt			0.997			0.865
Flt Protected						
Satd. Flow (prot)	0	6408	6389	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	6408	6389	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		245	541		662	
Travel Time (s)		5.6	12.3		15.0	
Peak Hour Factor	0.96	0.96	0.78	0.78	0.53	0.53
Adj. Flow (vph)	0	1429	2201	42	0	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1429	2243	0	0	32
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	35.4%
Analysis Period (min)	15
	ICU Level of Service A

Syncro Report - Signalized Intersections
200: Shirley Dr.


Existing 2021 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			  			  	
Traffic Volume (vph)	6	1337	14	72	1704	1	15	0	52	1	0	0
Future Volume (vph)	6	1337	14	72	1704	1	15	0	52	1	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998						0.895				
Flt Protected	0.950			0.950				0.989			0.950	
Satd. Flow (prot)	1770	6395	0	1770	6408	0	0	1649	0	0	1770	0
Flt Permitted	0.950			0.950				0.923			0.816	
Satd. Flow (perm)	1770	6395	0	1770	6408	0	0	1539	0	0	1520	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3						115				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		541			537			437			323	
Travel Time (s)		12.3			12.2			9.9			7.3	
Peak Hour Factor	0.99	0.99	0.99	0.78	0.78	0.78	0.86	0.86	0.86	0.50	0.50	0.50
Adj. Flow (vph)	6	1351	14	92	2185	1	17	0	60	2	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	6	1365	0	92	2186	0	0	77	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		

Syncro Report - Signalized Intersections
200: Shirley Dr.

Existing 2021 - AM

06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	11.0	54.0		21.0	64.0		25.0	25.0		25.0	25.0	
Total Split (%)	11.0%	54.0%		21.0%	64.0%		25.0%	25.0%		25.0%	25.0%	
Maximum Green (s)	6.5	49.5		16.5	59.5		20.5	20.5		20.5	20.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	C-Max		Min	C-Max		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	6.0	72.0		10.5	76.6			6.0			6.0	
Actuated g/C Ratio	0.06	0.72		0.10	0.77			0.06			0.06	
v/c Ratio	0.06	0.30		0.49	0.45			0.39			0.02	
Control Delay	40.3	3.3		54.3	2.0			8.8			44.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	40.3	3.3		54.3	2.1			8.8			44.0	
LOS	D	A		D	A			A			D	
Approach Delay		3.5			4.2			8.8			44.0	
Approach LOS		A			A			A			D	
90th %ile Green (s)	6.8	64.5		14.6	72.3		7.4	7.4		7.4	7.4	
90th %ile Term Code	Gap	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
70th %ile Green (s)	6.2	68.4		12.2	74.4		5.9	5.9		5.9	5.9	
70th %ile Term Code	Gap	Coord		Gap	Coord		Hold	Hold		Hold	Hold	
50th %ile Green (s)	5.8	70.4		10.5	75.1		5.6	5.6		5.6	5.6	
50th %ile Term Code	Gap	Coord		Gap	Coord		Hold	Hold		Hold	Hold	
30th %ile Green (s)	5.5	72.1		8.9	75.5		5.5	5.5		5.5	5.5	
30th %ile Term Code	Gap	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	5.5	84.6		6.4	85.5		0.0	0.0		0.0	0.0	
10th %ile Term Code	Gap	Coord		Gap	Coord		Skip	Skip		Skip	Skip	
Queue Length 50th (ft)	4	20		61	25			0			1	
Queue Length 95th (ft)	m9	57		m86	65			16			5	
Internal Link Dist (ft)		461			457			357			243	
Turn Bay Length (ft)	300			150								
Base Capacity (vph)	116	4605		292	4905			406			311	
Starvation Cap Reductn	0	0		0	582			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.05	0.30		0.32	0.51			0.19			0.01	

Intersection Summary

Area Type: Other

Syncro Report - Signalized Intersections 200: Shirley Dr.

Existing 2021 - AM
06/27/2021

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 81 (81%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.49

Intersection Signal Delay: 4.0

Intersection LOS: A

Intersection Capacity Utilization 44.3%

ICU Level of Service A

Analysis Period (min) 15




















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Shirley Dr.



Syncro Report - Signalized Intersections
210: I-20 EB Ramp













Existing 2021 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	326	0	373	0	0	0	0	792	1211	579	1548	0
Future Volume (vph)	326	0	373	0	0	0	0	792	1211	579	1548	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	225		0	0		0
Storage Lanes	2		1	0		0	0		2	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.88	1.00	0.91	1.00
Frt			0.850						0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	3242	0	1524	0	0	0	0	5836	2538	1719	4631	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	3242	0	1524	0	0	0	0	5836	2538	1719	4631	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			65						881			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		758			734			537			524	
Travel Time (s)		17.2			16.7			12.2			11.9	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.97	0.97	0.97	0.94	0.94	0.94
Heavy Vehicles (%)	8%	2%	6%	2%	2%	2%	12%	12%	12%	5%	12%	2%
Adj. Flow (vph)	370	0	424	0	0	0	0	816	1248	616	1647	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	370	0	424	0	0	0	0	816	1248	616	1647	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1					2	1	1	2	
Detector Template	Left		Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20		20					100	20	20	100	
Trailing Detector (ft)	0		0					0	0	0	0	
Detector 1 Position(ft)	0		0					0	0	0	0	
Detector 1 Size(ft)	20		20					6	20	20	6	
Detector 1 Type	Cl+Ex		Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Prot		Perm					NA	Perm	Prot	NA	
Protected Phases	7							2		1	6	

Syncro Report - Signalized Intersections
210: I-20 EB Ramp

Existing 2021 - AM

06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases			7						2			
Detector Phase	7		7					2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0		5.0					5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5		9.5					22.5	22.5	9.5	22.5	
Total Split (s)	28.0		28.0					32.0	32.0	40.0	72.0	
Total Split (%)	28.0%		28.0%					32.0%	32.0%	40.0%	72.0%	
Maximum Green (s)	23.5		23.5					27.5	27.5	35.5	67.5	
Yellow Time (s)	3.5		3.5					3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0		1.0					1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5		4.5					4.5	4.5	4.5	4.5	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0		3.0					3.0	3.0	3.0	3.0	
Recall Mode	None		None					C-Min	C-Min	None	C-Min	
Walk Time (s)								7.0	7.0		7.0	
Flash Dont Walk (s)								11.0	11.0		11.0	
Pedestrian Calls (#/hr)								0	0		0	
Act Effct Green (s)	23.5		23.5					27.5	27.5	35.5	67.5	
Actuated g/C Ratio	0.24		0.24					0.28	0.28	0.36	0.68	
v/c Ratio	0.49		1.04					0.51	0.93	1.01	0.53	
Control Delay	35.6		89.1					24.2	24.1	66.6	6.3	
Queue Delay	0.0		0.0					0.0	5.4	0.0	0.2	
Total Delay	35.6		89.1					24.2	29.6	66.6	6.5	
LOS	D		F					C	C	E	A	
Approach Delay		64.1						27.5			22.9	
Approach LOS		E						C			C	
90th %ile Green (s)	23.5		23.5					27.5	27.5	35.5	67.5	
90th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
70th %ile Green (s)	23.5		23.5					27.5	27.5	35.5	67.5	
70th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
50th %ile Green (s)	23.5		23.5					27.5	27.5	35.5	67.5	
50th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
30th %ile Green (s)	23.5		23.5					27.5	27.5	35.5	67.5	
30th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
10th %ile Green (s)	23.5		23.5					27.5	27.5	35.5	67.5	
10th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
Queue Length 50th (ft)	105		~260					127	228	~378	151	
Queue Length 95th (ft)	146		#434					105	#327	#620	155	
Internal Link Dist (ft)		678			654			457			444	
Turn Bay Length (ft)												
Base Capacity (vph)	761		407					1604	1336	610	3125	
Starvation Cap Reductn	0		0					0	66	0	610	
Spillback Cap Reductn	0		0					0	0	0	0	
Storage Cap Reductn	0		0					0	0	0	0	
Reduced v/c Ratio	0.49		1.04					0.51	0.98	1.01	0.65	

Intersection Summary

Syncro Report - Signalized Intersections 210: I-20 EB Ramp

Existing 2021 - AM
06/27/2021

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 7 (7%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 31.1

Intersection LOS: C

Intersection Capacity Utilization 95.0%

ICU Level of Service F

Analysis Period (min) 15

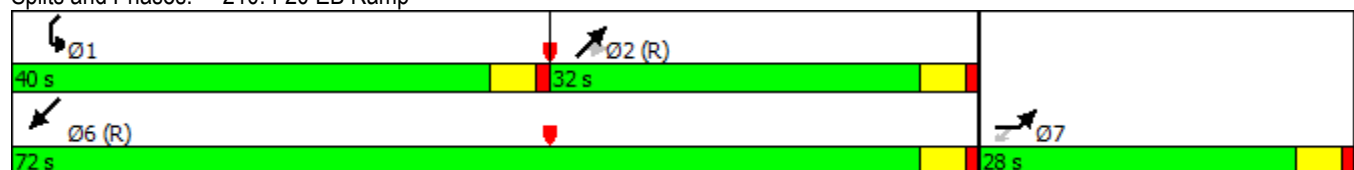
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.



















Queue shown is maximum after two cycles.

Splits and Phases: 210: I-20 EB Ramp















Syncro Report - Signalized Intersections
220: I-20 WB Ramp

Existing 2021 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	1000	0	326	104	964	0	0	1158	192
Future Volume (vph)	0	0	0	1000	0	326	104	964	0	0	1158	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		400	0		0	0		0
Storage Lanes	0		0	3		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.94	1.00	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Frt						0.850					0.979	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	4545	0	1524	1517	4715	0	0	5972	0
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	4545	0	1524	1517	4715	0	0	5972	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						89					46	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		487			795			524			744	
Travel Time (s)		11.1			18.1			11.9			16.9	
Peak Hour Factor	0.92	0.92	0.92	0.91	0.91	0.91	0.92	0.92	0.92	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	12%	2%	6%	19%	10%	2%	16%	8%	2%
Adj. Flow (vph)	0	0	0	1099	0	358	113	1048	0	0	1287	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	1099	0	358	113	1048	0	0	1500	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		36			36			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	
Detector Template				Left		Right	Left	Thru			Thru	
Leading Detector (ft)				20		20	20	100			100	
Trailing Detector (ft)				0		0	0	0			0	
Detector 1 Position(ft)				0		0	0	0			0	
Detector 1 Size(ft)				20		20	20	6			6	
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Prot		Perm	Prot	NA			NA	
Protected Phases				3			5	2			6	

Syncro Report - Signalized Intersections
220: I-20 WB Ramp

Existing 2021 - AM
06/27/2021

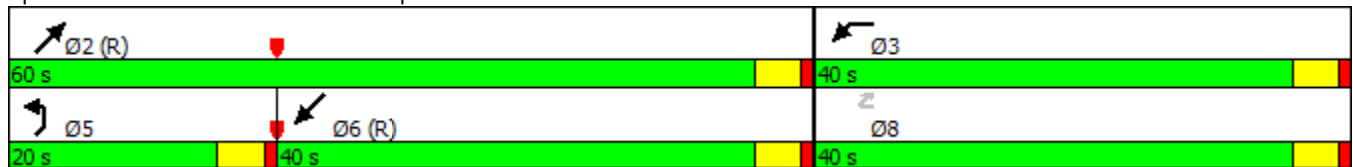
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases						8						
Detector Phase				3		8	5	2			6	
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	
Minimum Split (s)				9.5		22.5	9.5	22.5			22.5	
Total Split (s)				40.0		40.0	20.0	60.0			40.0	
Total Split (%)				40.0%		40.0%	20.0%	60.0%			40.0%	
Maximum Green (s)				35.5		35.5	15.5	55.5			35.5	
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	
Recall Mode				None		None	None	C-Min			C-Min	
Walk Time (s)						7.0		7.0			7.0	
Flash Dont Walk (s)						11.0		11.0			11.0	
Pedestrian Calls (#/hr)						0		0			0	
Act Effect Green (s)				30.6		30.6	12.2	60.4			43.7	
Actuated g/C Ratio				0.31		0.31	0.12	0.60			0.44	
v/c Ratio				0.79		0.68	0.61	0.37			0.57	
Control Delay				36.1		29.0	48.0	1.9			20.5	
Queue Delay				0.1		0.0	0.0	0.0			0.0	
Total Delay				36.2		29.0	48.0	1.9			20.5	
LOS				D		C	D	A			C	
Approach Delay					34.4			6.4			20.5	
Approach LOS					C			A			C	
90th %ile Green (s)				35.5		35.5	15.5	55.5			35.5	
90th %ile Term Code				Max		Hold	Max	Coord			Coord	
70th %ile Green (s)				33.0		33.0	14.8	58.0			38.7	
70th %ile Term Code				Gap		Hold	Gap	Coord			Coord	
50th %ile Green (s)				31.0		31.0	12.7	60.0			42.8	
50th %ile Term Code				Gap		Hold	Gap	Coord			Coord	
30th %ile Green (s)				28.8		28.8	10.6	62.2			47.1	
30th %ile Term Code				Gap		Hold	Gap	Coord			Coord	
10th %ile Green (s)				24.9		24.9	7.4	66.1			54.2	
10th %ile Term Code				Gap		Hold	Gap	Coord			Coord	
Queue Length 50th (ft)				225		149	32	0			172	
Queue Length 95th (ft)				257		236	97	0			218	
Internal Link Dist (ft)		407			715			444			664	
Turn Bay Length (ft)						400						
Base Capacity (vph)				1613		598	235	2845			2633	
Starvation Cap Reductn				0		0	0	0			0	
Spillback Cap Reductn				49		0	0	0			52	
Storage Cap Reductn				0		0	0	0			0	
Reduced v/c Ratio				0.70		0.60	0.48	0.37			0.58	
Intersection Summary												

Syncro Report - Signalized Intersections 220: I-20 WB Ramp

Existing 2021 - AM
06/27/2021



















Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 44 (44%), Referenced to phase 2:NET and 6:SWT, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 21.4	Intersection LOS: C
Intersection Capacity Utilization 95.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 220: I-20 WB Ramp















Syncro Report - Signalized Intersections
230: Wendell Dr.

Existing 2021 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	76	934	110	22	736	25	10	3	24	68	6	12
Future Volume (vph)	76	934	110	22	736	25	10	3	24	68	6	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	200		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984			0.995			0.913			0.982	
Flt Protected	0.950			0.950				0.987			0.962	
Satd. Flow (prot)	1597	4658	0	1805	4613	0	0	1570	0	0	1572	0
Flt Permitted	0.316			0.238				0.908			0.731	
Satd. Flow (perm)	531	4658	0	452	4613	0	0	1444	0	0	1195	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		54			13			38			13	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			1498			395			449	
Travel Time (s)		16.9			34.0			9.0			10.2	
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.64	0.64	0.64	0.89	0.89	0.89
Heavy Vehicles (%)	13%	10%	6%	0%	12%	8%	2%	2%	13%	16%	17%	2%
Adj. Flow (vph)	83	1015	120	25	836	28	16	5	38	76	7	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	1135	0	25	864	0	0	59	0	0	96	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	

Syncro Report - Signalized Intersections
230: Wendell Dr.

Existing 2021 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	27.5	27.5		27.5	27.5		22.5	22.5		22.5	22.5	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		45.0%	45.0%		45.0%	45.0%	
Maximum Green (s)	23.0	23.0		23.0	23.0		18.0	18.0		18.0	18.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)	38.3	38.3		38.3	38.3			8.5			8.8	
Actuated g/C Ratio	0.77	0.77		0.77	0.77			0.17			0.18	
v/c Ratio	0.20	0.32		0.07	0.24			0.21			0.43	
Control Delay	5.4	3.8		5.4	4.2			10.6			21.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	5.4	3.8		5.4	4.2			10.6			21.7	
LOS	A	A		A	A			B			C	
Approach Delay		3.9			4.3			10.6			21.7	
Approach LOS		A			A			B			C	
90th %ile Green (s)	28.2	28.2		28.2	28.2		12.8	12.8		12.8	12.8	
90th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
70th %ile Green (s)	30.7	30.7		30.7	30.7		10.3	10.3		10.3	10.3	
70th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
50th %ile Green (s)	32.4	32.4		32.4	32.4		8.6	8.6		8.6	8.6	
50th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
30th %ile Green (s)	45.5	45.5		45.5	45.5		0.0	0.0		0.0	0.0	
30th %ile Term Code	Coord	Coord		Coord	Coord		Skip	Skip		Skip	Skip	
10th %ile Green (s)	45.5	45.5		45.5	45.5		0.0	0.0		0.0	0.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		Skip	Skip		Skip	Skip	
Queue Length 50th (ft)	19	134		3	61			5			22	
Queue Length 95th (ft)	m54	169		m4	m65			15			50	
Internal Link Dist (ft)		664			1418			315			369	
Turn Bay Length (ft)	150			200								
Base Capacity (vph)	406	3577		345	3533			544			438	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.20	0.32		0.07	0.24			0.11			0.22	
Intersection Summary												

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 6 (12%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 45

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.43

Intersection Signal Delay: 5.0

Intersection LOS: A

Intersection Capacity Utilization 47.4%

ICU Level of Service A

Analysis Period (min) 15

























m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 230: Wendell Dr.















Syncro Report - Signalized Intersections
240: MLK Jr. Dr.

Existing 2021 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	333	847	831	119	258	20	360	728	159	35	387	76
Future Volume (vph)	333	847	831	119	258	20	360	728	159	35	387	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	250		400	350		0	300		0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3273	3505	1553	3183	3539	1538	3335	3223	1455	3072	3034	1538
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3273	3505	1553	3183	3539	1538	3335	3223	1455	3072	3034	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			301			213			166			213
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1101			1180			1498			1729	
Travel Time (s)		25.0			26.8			34.0			39.3	
Peak Hour Factor	0.91	0.91	0.91	0.81	0.81	0.81	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	7%	3%	4%	10%	2%	5%	5%	12%	11%	14%	19%	5%
Adj. Flow (vph)	366	931	913	147	319	25	375	758	166	36	403	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	366	931	913	147	319	25	375	758	166	36	403	79
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Syncro Report - Signalized Intersections
240: MLK Jr. Dr.

Existing 2021 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.3	50.0	50.0	10.0	37.7	37.7	16.6	30.5	30.5	9.5	23.4	23.4
Total Split (%)	22.3%	50.0%	50.0%	10.0%	37.7%	37.7%	16.6%	30.5%	30.5%	9.5%	23.4%	23.4%
Maximum Green (s)	17.8	45.5	45.5	5.5	33.2	33.2	12.1	26.0	26.0	5.0	18.9	18.9
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	15.7	45.8	45.8	6.0	36.0	36.0	12.1	29.1	29.1	5.0	18.2	18.2
Actuated g/C Ratio	0.16	0.46	0.46	0.06	0.36	0.36	0.12	0.29	0.29	0.05	0.18	0.18
v/c Ratio	0.71	0.58	1.05	0.77	0.25	0.04	0.93	0.81	0.31	0.24	0.73	0.17
Control Delay	48.0	21.9	62.9	73.7	23.9	0.1	70.2	33.6	4.6	38.5	38.3	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	21.9	62.9	73.7	23.9	0.1	70.2	33.6	4.6	38.5	38.3	5.6
LOS	D	C	E	E	C	A	E	C	A	D	D	A
Approach Delay		43.2			37.6			40.4			33.3	
Approach LOS		D			D			D			C	
90th %ile Green (s)	17.8	45.5	45.5	5.5	33.2	33.2	12.1	26.0	26.0	5.0	18.9	18.9
90th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	17.8	45.5	45.5	5.5	33.2	33.2	12.1	26.0	26.0	5.0	18.9	18.9
70th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	16.3	45.5	45.5	5.5	34.7	34.7	12.1	26.0	26.0	5.0	18.9	18.9
50th %ile Term Code	Gap	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Max	Coord	Coord
30th %ile Green (s)	14.6	45.5	45.5	5.5	36.4	36.4	12.1	35.5	35.5	0.0	18.9	18.9
30th %ile Term Code	Gap	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Skip	Coord	Coord
10th %ile Green (s)	12.0	46.8	46.8	7.9	42.7	42.7	12.1	31.8	31.8	0.0	15.2	15.2
10th %ile Term Code	Gap	Max	Max	Gap	Hold	Hold	Max	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	114	225	~525	48	75	0	98	254	25	10	135	7
Queue Length 95th (ft)	160	287	#765	#88	100	0	#201	#366	17	24	182	21
Internal Link Dist (ft)		1021			1100			1418			1649	
Turn Bay Length (ft)				250		400	350			300		
Base Capacity (vph)	582	1603	873	190	1275	690	403	936	540	153	573	463
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.58	1.05	0.77	0.25	0.04	0.93	0.81	0.31	0.24	0.70	0.17

Intersection Summary

Syncro Report - Signalized Intersections 240: MLK Jr. Dr.

Existing 2021 - AM
06/27/2021

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 40.6

Intersection LOS: D

Intersection Capacity Utilization 77.6%

ICU Level of Service D

Analysis Period (min) 15

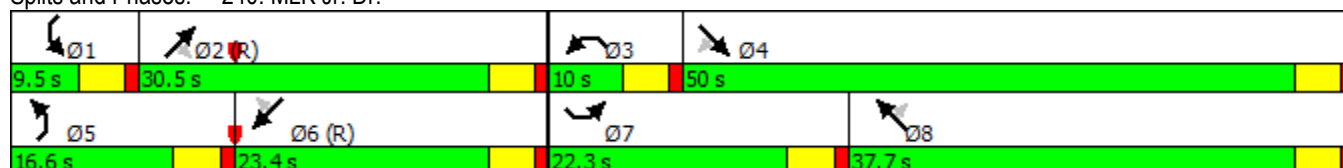
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.























Splits and Phases: 240: MLK Jr. Dr.



Syncro Report - Signalized Intersections
250: Old Gordon Rd.













Existing 2021 - AM

06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	4	4	4	21	45	20	63	1064	20	8	332	20
Future Volume (vph)	4	4	4	21	45	20	63	1064	20	8	332	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	150		250
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.954				0.850			0.850
Flt Protected		0.976		0.950			0.950			0.950		
Satd. Flow (prot)	0	1818	1583	1770	1777	0	1770	3008	1583	1770	3008	1583
Flt Permitted		0.912		0.638			0.464			0.117		
Satd. Flow (perm)	0	1699	1583	1188	1777	0	864	3008	1583	218	3008	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115		21				115			115
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		617			886			1729			1350	
Travel Time (s)		14.0			20.1			39.3			30.7	
Peak Hour Factor	0.50	0.50	0.50	0.66	0.94	0.94	0.79	0.84	0.84	0.50	0.81	0.81
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	20%	2%	2%	20%	2%
Adj. Flow (vph)	8	8	8	32	48	21	80	1267	24	16	410	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	8	32	69	0	80	1267	24	16	410	25
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		6		5	2		7	4		3	8	

Syncro Report - Signalized Intersections
250: Old Gordon Rd.

Existing 2021 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	6		6	2			4		4	8		8
Detector Phase	6	6	6	5	2		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	23.0	23.0	23.0	9.5	32.5		9.6	58.0	58.0	9.5	57.9	57.9
Total Split (%)	23.0%	23.0%	23.0%	9.5%	32.5%		9.6%	58.0%	58.0%	9.5%	57.9%	57.9%
Maximum Green (s)	18.5	18.5	18.5	5.0	28.0		5.1	53.5	53.5	5.0	53.4	53.4
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0			0	0		0	0
Act Effect Green (s)		30.8	30.8	36.8	36.8		52.4	50.4	50.4	50.5	46.5	46.5
Actuated g/C Ratio		0.31	0.31	0.37	0.37		0.52	0.50	0.50	0.50	0.46	0.46
v/c Ratio		0.03	0.01	0.07	0.10		0.16	0.84	0.03	0.09	0.29	0.03
Control Delay		32.2	0.0	25.0	18.9		2.3	11.3	0.1	9.0	16.6	0.1
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		32.2	0.0	25.0	18.9		2.3	11.3	0.1	9.0	16.6	0.1
LOS		C	A	C	B		A	B	A	A	B	A
Approach Delay		21.5			20.8			10.5			15.5	
Approach LOS		C			C			B			B	
90th %ile Green (s)	18.5	18.5	18.5	5.0	28.0		5.1	53.5	53.5	5.0	53.4	53.4
90th %ile Term Code	Coord	Coord	Coord	Max	Coord		Max	Max	Max	Max	Hold	Hold
70th %ile Green (s)	18.5	18.5	18.5	5.0	28.0		5.1	53.5	53.5	5.0	53.4	53.4
70th %ile Term Code	Coord	Coord	Coord	Max	Coord		Max	Max	Max	Max	Hold	Hold
50th %ile Green (s)	27.6	27.6	27.6	6.6	38.7		5.1	52.3	52.3	0.0	42.7	42.7
50th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Max	Gap	Gap	Skip	Hold	Hold
30th %ile Green (s)	41.8	41.8	41.8	0.0	41.8		5.1	49.2	49.2	0.0	39.6	39.6
30th %ile Term Code	Coord	Coord	Coord	Skip	Coord		Max	Gap	Gap	Skip	Hold	Hold
10th %ile Green (s)	47.6	47.6	47.6	0.0	47.6		0.0	43.4	43.4	0.0	43.4	43.4
10th %ile Term Code	Coord	Coord	Coord	Skip	Coord		Skip	Gap	Gap	Skip	Hold	Hold
Queue Length 50th (ft)		7	0	13	19		5	42	0	5	88	0
Queue Length 95th (ft)		15	0	28	56		m4	39	m0	6	87	0
Internal Link Dist (ft)		537			806			1649			1270	
Turn Bay Length (ft)							150			150		250
Base Capacity (vph)		523	567	469	667		499	1609	900	187	1606	898
Starvation Cap Reductn		0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio		0.03	0.01	0.07	0.10		0.16	0.79	0.03	0.09	0.26	0.03

Intersection Summary

Syncro Report - Signalized Intersections 250: Old Gordon Rd.

Existing 2021 - AM
06/27/2021

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:NWTL and 6:SETL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 12.3

Intersection LOS: B







Intersection Capacity Utilization 52.7%

ICU Level of Service A

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.







Splits and Phases: 250: Old Gordon Rd.

 Ø2 (L)	 Ø3	 Ø4
32.5 s	9.5 s	58 s
 Ø5	 Ø7	 Ø8
9.5 s	9.6 s	57.9 s

Syncro Report - Signalized Intersections
270: Fulton Ind. Blvd & UPS Drive

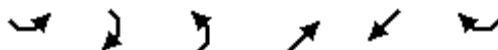
Existing 2021 - AM
06/27/2021



Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	102	102	200	800	350	0
Future Volume (vph)	102	102	200	800	350	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	0.850					
Flt Protected	0.950	0.950				
Satd. Flow (prot)	902	808	950	3008	3008	1863
Flt Permitted	0.950	0.434				
Satd. Flow (perm)	902	808	434	3008	3008	1863
Right Turn on Red	Yes					Yes
Satd. Flow (RTOR)	111					
Link Speed (mph)	30	30				30
Link Distance (ft)	912	1889				1254
Travel Time (s)	20.7	42.9				28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	100%	100%	90%	20%	20%	2%
Adj. Flow (vph)	111	111	217	870	380	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	111	111	217	870	380	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12	12				12
Link Offset(ft)	0	0				0
Crosswalk Width(ft)	16	16				16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9		
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4	5		2	6	
Permitted Phases	4		2	6		
Detector Phase	4	4	5	2	6	6
Switch Phase						

Syncro Report - Signalized Intersections
270: Fulton Ind. Blvd & UPS Drive

Existing 2021 - AM
06/27/2021



Lane Group	SEL	SER	NEL	NET	SWT	SWR
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	10.0	32.5	22.5	22.5
Total Split (%)	40.9%	40.9%	18.2%	59.1%	40.9%	40.9%
Maximum Green (s)	18.0	18.0	5.5	28.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effect Green (s)	11.2	11.2	31.3	32.2	21.2	
Actuated g/C Ratio	0.23	0.23	0.63	0.65	0.43	
v/c Ratio	0.54	0.41	0.65	0.44	0.29	
Control Delay	26.4	8.8	21.9	7.4	12.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	26.4	8.8	21.9	7.4	12.2	
LOS	C	A	C	A	B	
Approach Delay	17.6			10.3	12.2	
Approach LOS	B			B	B	
90th %ile Green (s)	18.0	18.0	5.5	28.0	18.0	18.0
90th %ile Term Code	Max	Max	Max	MaxR	MaxR	MaxR
70th %ile Green (s)	13.7	13.7	5.5	28.0	18.0	18.0
70th %ile Term Code	Gap	Gap	Max	MaxR	MaxR	MaxR
50th %ile Green (s)	11.0	11.0	5.5	28.0	18.0	18.0
50th %ile Term Code	Gap	Gap	Max	MaxR	MaxR	MaxR
30th %ile Green (s)	8.6	8.6	5.5	28.0	18.0	18.0
30th %ile Term Code	Gap	Gap	Max	MaxR	MaxR	MaxR
10th %ile Green (s)	0.0	0.0	5.5	43.0	33.0	33.0
10th %ile Term Code	Skip	Skip	Max	Dwell	Dwell	Dwell
Queue Length 50th (ft)	27	0	28	62	37	
Queue Length 95th (ft)	65	29	#138	140	80	
Internal Link Dist (ft)	832			1809	1174	
Turn Bay Length (ft)						
Base Capacity (vph)	330	366	332	1960	1291	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.34	0.30	0.65	0.44	0.29	

Intersection Summary

Area Type: Other

Cycle Length: 55

Actuated Cycle Length: 49.4

Syncro Report - Signalized Intersections
270: Fulton Ind. Blvd & UPS Drive

Existing 2021 - AM
06/27/2021

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 11.7

Intersection LOS: B

Intersection Capacity Utilization 37.7%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 55

70th %ile Actuated Cycle: 50.7

50th %ile Actuated Cycle: 48

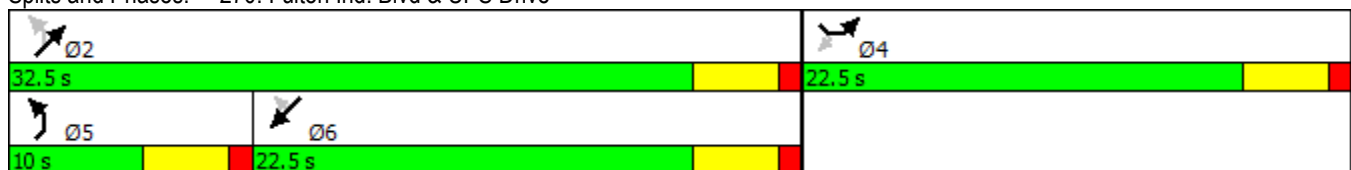
30th %ile Actuated Cycle: 45.6

10th %ile Actuated Cycle: 47.5

95th percentile volume exceeds capacity, queue may be longer.













Queue shown is maximum after two cycles.

Splits and Phases: 270: Fulton Ind. Blvd & UPS Drive



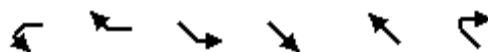
Syncro Report - Signalized Intersections
280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy

Existing 2021 - AM
06/27/2021

						
Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	45	0	99	1533	741	0
Future Volume (vph)	45	0	99	1533	741	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	300			0
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Fr						
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1863	1570	3139	3139	1652
Flt Permitted	0.950		0.318			
Satd. Flow (perm)	1770	1863	525	3139	3139	1652
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	1300			1130	416	
Travel Time (s)	29.5			25.7	9.5	
Peak Hour Factor	0.72	0.72	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	15%	15%	15%	15%
Adj. Flow (vph)	63	0	108	1666	805	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	63	0	108	1666	805	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	8		1	6	2	

Syncro Report - Signalized Intersections
280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy

Existing 2021 - AM
06/27/2021



Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Permitted Phases		8	6			2
Detector Phase	8	8	1	6	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	13.0	106.0	93.0	93.0
Total Split (%)	18.5%	18.5%	10.0%	81.5%	71.5%	71.5%
Maximum Green (s)	19.5	19.5	8.5	101.5	88.5	88.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effect Green (s)	10.0		113.1	114.0	101.7	
Actuated g/C Ratio	0.08		0.87	0.88	0.78	
v/c Ratio	0.46		0.21	0.61	0.33	
Control Delay	67.6		2.6	4.1	2.0	
Queue Delay	0.5		0.0	0.1	0.1	
Total Delay	68.1		2.6	4.2	2.1	
LOS	E		A	A	A	
Approach Delay	68.1			4.1	2.1	
Approach LOS	E			A	A	
90th %ile Green (s)	13.9	13.9	8.4	107.1	94.2	94.2
90th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
70th %ile Green (s)	11.6	11.6	7.4	109.4	97.5	97.5
70th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
50th %ile Green (s)	10.0	10.0	6.9	111.0	99.6	99.6
50th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
30th %ile Green (s)	8.4	8.4	6.4	112.6	101.7	101.7
30th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
10th %ile Green (s)	0.0	0.0	5.6	125.5	115.4	115.4
10th %ile Term Code	Skip	Skip	Gap	Coord	Coord	Coord
Queue Length 50th (ft)	52		11	168	22	
Queue Length 95th (ft)	77		24	267	133	
Internal Link Dist (ft)	1220			1050	336	
Turn Bay Length (ft)			300			
Base Capacity (vph)	265		525	2753	2455	
Starvation Cap Reductn	0		0	0	659	
Spillback Cap Reductn	59		0	245	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.31		0.21	0.66	0.45	





Intersection Summary

Syncro Report - Signalized Intersections
 280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy

Existing 2021 - AM
 06/27/2021

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	32 (25%), Referenced to phase 2:NWT and 6:SETL, Start of Green
Natural Cycle:	65
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.61
Intersection Signal Delay:	5.0
Intersection LOS:	A
Intersection Capacity Utilization	54.0%
ICU Level of Service	A
Analysis Period (min)	15






















Splits and Phases: 280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy

 Ø1  Ø2 (R)	 Ø8
13 s	93 s
 Ø6 (R)	
106 s	24 s

Syncro Report - Signalized Intersections
290: Fulton Ind. Blvd & Donald Lee Hollowell Pkwy













Existing 2021 - AM

06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	176	1568	200	88	728	0	60	311	0	49	52	50
Future Volume (vph)	176	1568	200	88	728	0	60	311	0	49	52	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	300		0	300		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850								0.929	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1570	3139	1404	1570	3139	0	1504	3008	0	1570	2916	0
Flt Permitted	0.298			0.078			0.631			0.318		
Satd. Flow (perm)	492	3139	1404	129	3139	0	999	3008	0	525	2916	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			196								64	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		416			899			1051			1138	
Travel Time (s)		9.5			20.4			23.9			25.9	
Peak Hour Factor	0.80	0.95	0.92	0.92	0.96	0.92	0.83	0.90	0.92	0.72	0.72	0.78
Heavy Vehicles (%)	15%	15%	15%	15%	15%	15%	20%	20%	20%	15%	15%	15%
Adj. Flow (vph)	220	1651	217	96	758	0	72	346	0	68	72	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	1651	217	96	758	0	72	346	0	68	136	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	

Syncro Report - Signalized Intersections
290: Fulton Ind. Blvd & Donald Lee Hollowell Pkwy

Existing 2021 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	6		6	2			4			8		
Detector Phase	1	6	6	5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	19.4	84.0	84.0	12.0	76.6		11.2	24.0		10.0	22.8	
Total Split (%)	14.9%	64.6%	64.6%	9.2%	58.9%		8.6%	18.5%		7.7%	17.5%	
Maximum Green (s)	14.9	79.5	79.5	7.5	72.1		6.7	19.5		5.5	18.3	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)		11.0	11.0		11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effect Green (s)	93.2	82.4	82.4	85.2	78.1		24.1	18.3		22.5	17.5	
Actuated g/C Ratio	0.72	0.63	0.63	0.66	0.60		0.19	0.14		0.17	0.13	
v/c Ratio	0.49	0.83	0.23	0.59	0.40		0.34	0.82		0.49	0.30	
Control Delay	9.4	21.7	2.1	34.8	9.5		46.5	70.1		54.4	28.7	
Queue Delay	0.0	0.9	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	9.4	22.6	2.1	34.8	9.5		46.5	70.1		54.4	28.7	
LOS	A	C	A	C	A		D	E		D	C	
Approach Delay		19.1			12.3			66.0			37.3	
Approach LOS		B			B			E			D	
90th %ile Green (s)	14.9	79.5	79.5	7.5	72.1		6.7	19.5		5.5	18.3	
90th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Max		Max	Hold	
70th %ile Green (s)	13.1	79.5	79.5	7.5	73.9		6.7	19.5		5.5	18.3	
70th %ile Term Code	Gap	Coord	Coord	Max	Coord		Max	Max		Max	Hold	
50th %ile Green (s)	11.7	79.5	79.5	7.5	75.3		6.7	19.5		5.5	18.3	
50th %ile Term Code	Gap	Coord	Coord	Max	Coord		Max	Max		Max	Hold	
30th %ile Green (s)	10.6	78.2	78.2	7.3	74.9		8.8	18.1		8.4	17.7	
30th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Gap	Gap		Gap	Hold	
10th %ile Green (s)	7.4	95.5	95.5	6.0	94.1		0.0	15.0		0.0	15.0	
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Skip	Gap		Skip	Hold	
Queue Length 50th (ft)	50	582	2	16	62		50	149		47	28	
Queue Length 95th (ft)	74	514	35	#95	141		86	#207		70	43	
Internal Link Dist (ft)		336			819			971			1058	
Turn Bay Length (ft)	200		200	300			300			200		
Base Capacity (vph)	479	1996	964	167	1884		212	451		140	465	
Starvation Cap Reductn	0	136	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.46	0.89	0.23	0.57	0.40		0.34	0.77		0.49	0.29	

Intersection Summary

Syncro Report - Signalized Intersections
 290: Fulton Ind. Blvd & Donald Lee Hollowell Pkwy

Existing 2021 - AM
 06/27/2021

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 102 (78%), Referenced to phase 2:NWTL and 6:SETL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 24.0

Intersection LOS: C

Intersection Capacity Utilization 76.0%









ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



















Splits and Phases: 290: Fulton Ind. Blvd & Donald Lee Hollowell Pkwy

 Ø1	 Ø2 (R)	 Ø3	 Ø4
19.4 s	76.6 s	10 s	24 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
12 s	84 s	11.2 s	22.8 s

Syncro Report - Signalized Intersections
300: Bolton Rd & Donald Lee Hollowell Pkwy

Existing 2021 - AM













06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	8	1234	31	38	1038	14	13	31	62	18	14	12
Future Volume (vph)	8	1234	31	38	1038	14	13	31	62	18	14	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.998			0.921			0.962	
Flt Protected	0.950			0.950				0.994			0.980	
Satd. Flow (prot)	1444	3082	0	1719	3190	0	0	1696	0	0	1695	0
Flt Permitted	0.212			0.179				0.964			0.573	
Satd. Flow (perm)	322	3082	0	324	3190	0	0	1644	0	0	991	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			2			48			13	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		899			304			783			722	
Travel Time (s)		20.4			6.9			17.8			16.4	
Peak Hour Factor	0.98	0.98	0.98	0.85	0.85	0.85	0.93	0.93	0.93	0.72	0.72	0.72
Heavy Vehicles (%)	25%	17%	3%	5%	13%	7%	2%	2%	3%	11%	2%	2%
Adj. Flow (vph)	8	1259	32	45	1221	16	14	33	67	25	19	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	1291	0	45	1237	0	0	114	0	0	61	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			8	

Syncro Report - Signalized Intersections
300: Bolton Rd & Donald Lee Hollowell Pkwy

Existing 2021 - AM

06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	11.0	91.0		12.0	92.0		27.0	27.0		27.0	27.0	
Total Split (%)	8.5%	70.0%		9.2%	70.8%		20.8%	20.8%		20.8%	20.8%	
Maximum Green (s)	6.5	86.5		7.5	87.5		22.5	22.5		22.5	22.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	106.1	101.6		109.5	108.1			10.8			10.8	
Actuated g/C Ratio	0.82	0.78		0.84	0.83			0.08			0.08	
v/c Ratio	0.03	0.54		0.13	0.47			0.63			0.65	
Control Delay	0.5	1.5		2.7	4.9			48.5			75.1	
Queue Delay	0.0	0.1		0.0	0.3			0.0			0.0	
Total Delay	0.5	1.6		2.7	5.3			48.5			75.1	
LOS	A	A		A	A			D			E	
Approach Delay		1.6			5.2			48.5			75.1	
Approach LOS		A			A			D			E	
90th %ile Green (s)	5.9	93.1		6.9	94.1		16.5	16.5		16.5	16.5	
90th %ile Term Code	Gap	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
70th %ile Green (s)	0.0	97.2		6.3	108.0		13.0	13.0		13.0	13.0	
70th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	0.0	99.8		6.0	110.3		10.7	10.7		10.7	10.7	
50th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	0.0	102.4		5.7	112.6		8.4	8.4		8.4	8.4	
30th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	0.0	115.5		0.0	115.5		5.5	5.5		5.5	5.5	
10th %ile Term Code	Skip	Coord		Skip	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)	1	49		4	78			54			40	
Queue Length 95th (ft)	m0	11		m11	354			113			65	
Internal Link Dist (ft)		819			224			703			642	
Turn Bay Length (ft)	400			150								
Base Capacity (vph)	320	2409		353	2652			324			182	
Starvation Cap Reductn	0	0		0	747			0			0	
Spillback Cap Reductn	0	225		0	0			3			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.03	0.59		0.13	0.65			0.36			0.34	

Intersection Summary

Syncro Report - Signalized Intersections
300: Bolton Rd & Donald Lee Hollowell Pkwy

Existing 2021 - AM

06/27/2021

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 22 (17%), Referenced to phase 2:NWTL and 6:SETL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 6.8

Intersection LOS: A

Intersection Capacity Utilization 49.0%

ICU Level of Service A

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

















Splits and Phases: 300: Bolton Rd & Donald Lee Hollowell Pkwy

 Ø1	 Ø2 (R)	 Ø4
11 s	92 s	27 s
 Ø5	 Ø6 (R)	 Ø8
12 s	91 s	27 s

Syncro Report - Signalized Intersections
310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp












Existing 2021 - AM

06/27/2021

											
Lane Group	NBL	NBR	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR
Lane Configurations											
Traffic Volume (vph)	0	0	0	843	526	158	636	0	76	0	419
Future Volume (vph)	0	0	0	843	526	158	636	0	76	0	419
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00
Fr't				0.942							0.850
Flt Protected						0.950			0.950		
Satd. Flow (prot)	0	0	0	3011	0	1262	3252	0	2736	0	1417
Flt Permitted						0.088			0.950		
Satd. Flow (perm)	0	0	0	3011	0	117	3252	0	2736	0	1417
Right Turn on Red					Yes			Yes			Yes
Satd. Flow (RTOR)				154							308
Link Speed (mph)	30			30			30			30	
Link Distance (ft)	922			304			568			593	
Travel Time (s)	21.0			6.9			12.9			13.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.87	0.87	0.87
Heavy Vehicles (%)	2%	2%	2%	11%	16%	43%	11%	2%	28%	2%	14%
Adj. Flow (vph)	0	0	0	916	572	165	663	0	87	0	482
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	0	1488	0	165	663	0	87	0	482
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			24			24			24	
Link Offset(ft)	0			0			0			0	
Crosswalk Width(ft)	16			16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15		9	15		9	15	15	9
Number of Detectors				2		1	2		1		1
Detector Template				Thru		Left	Thru		Left		Right
Leading Detector (ft)				100		20	100		20		20
Trailing Detector (ft)				0		0	0		0		0
Detector 1 Position(ft)				0		0	0		0		0
Detector 1 Size(ft)				6		20	6		20		20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)				0.0		0.0	0.0		0.0		0.0
Detector 1 Queue (s)				0.0		0.0	0.0		0.0		0.0
Detector 1 Delay (s)				0.0		0.0	0.0		0.0		0.0
Detector 2 Position(ft)				94			94				
Detector 2 Size(ft)				6			6				
Detector 2 Type				Cl+Ex			Cl+Ex				
Detector 2 Channel											
Detector 2 Extend (s)				0.0			0.0				
Turn Type				NA		pm+pt	NA		Prot		Perm
Protected Phases				6		5	2		3		
Permitted Phases						2					8
Detector Phase				6		5	2		3		8
Switch Phase											

Syncro Report - Signalized Intersections
310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp

Existing 2021 - AM
06/27/2021

											
Lane Group	NBL	NBR	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR
Minimum Initial (s)				5.0		5.0	5.0		5.0		5.0
Minimum Split (s)				22.5		9.5	22.5		9.5		22.5
Total Split (s)				71.0		22.0	93.0		37.0		37.0
Total Split (%)				54.6%		16.9%	71.5%		28.5%		28.5%
Maximum Green (s)				66.5		17.5	88.5		32.5		32.5
Yellow Time (s)				3.5		3.5	3.5		3.5		3.5
All-Red Time (s)				1.0		1.0	1.0		1.0		1.0
Lost Time Adjust (s)				0.0		0.0	0.0		0.0		0.0
Total Lost Time (s)				4.5		4.5	4.5		4.5		4.5
Lead/Lag				Lag		Lead					
Lead-Lag Optimize?				Yes		Yes					
Vehicle Extension (s)				3.0		3.0	3.0		3.0		3.0
Recall Mode				C-Min		None	C-Min		None		None
Walk Time (s)				7.0			7.0				7.0
Flash Dont Walk (s)				11.0			11.0				11.0
Pedestrian Calls (#/hr)				0			0				0
Act Effect Green (s)				76.9		96.7	96.7		24.3		24.3
Actuated g/C Ratio				0.59		0.74	0.74		0.19		0.19
v/c Ratio				0.81		0.75	0.27		0.17		0.94
Control Delay				13.3		45.7	7.3		42.2		44.4
Queue Delay				0.0		0.0	0.0		0.0		0.6
Total Delay				13.3		45.7	7.3		42.2		44.9
LOS				B		D	A		D		D
Approach Delay				13.3			15.0			44.5	
Approach LOS				B			B			D	
90th %ile Green (s)				66.5		17.5	88.5		32.5		32.5
90th %ile Term Code				Coord		Max	Coord		Hold		Max
70th %ile Green (s)				66.5		17.5	88.5		32.5		32.5
70th %ile Term Code				Coord		Max	Coord		Hold		Max
50th %ile Green (s)				71.0		18.6	94.1		26.9		26.9
50th %ile Term Code				Coord		Gap	Coord		Hold		Gap
30th %ile Green (s)				82.2		14.4	101.1		19.9		19.9
30th %ile Term Code				Coord		Gap	Coord		Hold		Gap
10th %ile Green (s)				98.5		8.2	111.2		9.8		9.8
10th %ile Term Code				Coord		Gap	Coord		Hold		Gap
Queue Length 50th (ft)				220		71	96		31		158
Queue Length 95th (ft)				#610		m#149	121		50		278
Internal Link Dist (ft)	842			224			488			513	
Turn Bay Length (ft)											
Base Capacity (vph)				1844		243	2418		684		585
Starvation Cap Reductn				0		0	0		0		0
Spillback Cap Reductn				0		0	136		0		12
Storage Cap Reductn				0		0	0		0		0
Reduced v/c Ratio				0.81		0.68	0.29		0.13		0.84
Intersection Summary											
Area Type:	Other										
Cycle Length: 130											
Actuated Cycle Length: 130											

Syncro Report - Signalized Intersections
 310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp

Existing 2021 - AM
 06/27/2021

Offset: 127 (98%), Referenced to phase 2:NWTL and 6:SET, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 19.9

Intersection LOS: B

Intersection Capacity Utilization 56.4%

ICU Level of Service B

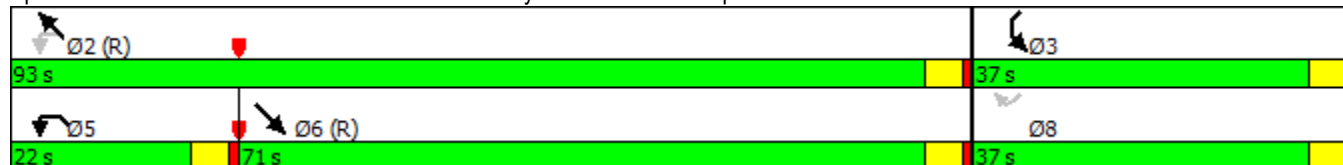
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

















Splits and Phases: 310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp



Syncro Report - Signalized Intersections
320: I-285 NB off-ramp & Donald Lee Hollowell Pkwy












Existing 2021 - AM

06/27/2021

											
Lane Group	SBL	SBR	SEL	SET	SER	NWL	NWT	NWR	NEL2	NEL	NER
Lane Configurations											
Traffic Volume (vph)	0	0	443	477	0	0	352	133	451	0	206
Future Volume (vph)	0	0	443	477	0	0	352	133	451	0	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	300		0	0		0		0	0
Storage Lanes	0	0	1		0	0		0		2	1
Taper Length (ft)	25		25			25				25	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt							0.959				0.850
Flt Protected			0.950						0.950		
Satd. Flow (prot)	0	0	1504	3167	0	0	3875	0	3127	0	1335
Flt Permitted			0.323						0.950		
Satd. Flow (perm)	0	0	511	3167	0	0	3875	0	3127	0	1335
Right Turn on Red					Yes			Yes			Yes
Satd. Flow (RTOR)							147				385
Link Speed (mph)	30			30			30			30	
Link Distance (ft)	782			568			1114			887	
Travel Time (s)	17.8			12.9			25.3			20.2	
Peak Hour Factor	0.92	0.92	0.90	0.90	0.90	0.83	0.83	0.83	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	20%	14%	2%	2%	24%	40%	12%	2%	21%
Adj. Flow (vph)	0	0	492	530	0	0	424	160	480	0	219
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	492	530	0	0	584	0	480	0	219
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			12			12			24	
Link Offset(ft)	0			0			0			0	
Crosswalk Width(ft)	16			16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15		9	15		9	15	15	9
Number of Detectors			1	2			2		1		1
Detector Template			Left	Thru			Thru		Left		Right
Leading Detector (ft)			20	100			100		20		20
Trailing Detector (ft)			0	0			0		0		0
Detector 1 Position(ft)			0	0			0		0		0
Detector 1 Size(ft)			20	6			6		20		20
Detector 1 Type			Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex		Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)			0.0	0.0			0.0		0.0		0.0
Detector 1 Queue (s)			0.0	0.0			0.0		0.0		0.0
Detector 1 Delay (s)			0.0	0.0			0.0		0.0		0.0
Detector 2 Position(ft)				94			94				
Detector 2 Size(ft)				6			6				
Detector 2 Type				Cl+Ex			Cl+Ex				
Detector 2 Channel											
Detector 2 Extend (s)				0.0			0.0				
Turn Type			pm+pt	NA			NA		Prot		Perm
Protected Phases			5	2			6		3		

Syncro Report - Signalized Intersections
320: I-285 NB off-ramp & Donald Lee Hollowell Pkwy

Existing 2021 - AM
06/27/2021

											
Lane Group	SBL	SBR	SEL	SET	SER	NWL	NWT	NWR	NEL2	NEL	NER
Permitted Phases			2								3
Detector Phase			5	2			6		3		3
Switch Phase											
Minimum Initial (s)			5.0	5.0			5.0		5.0		5.0
Minimum Split (s)			9.5	22.5			22.5		9.5		9.5
Total Split (s)			24.2	47.2			23.0		17.8		17.8
Total Split (%)			37.2%	72.6%			35.4%		27.4%		27.4%
Maximum Green (s)			19.7	42.7			18.5		13.3		13.3
Yellow Time (s)			3.5	3.5			3.5		3.5		3.5
All-Red Time (s)			1.0	1.0			1.0		1.0		1.0
Lost Time Adjust (s)			0.0	0.0			0.0		0.0		0.0
Total Lost Time (s)			4.5	4.5			4.5		4.5		4.5
Lead/Lag			Lead				Lag				
Lead-Lag Optimize?			Yes				Yes				
Vehicle Extension (s)			3.0	3.0			3.0		3.0		3.0
Recall Mode			Min	C-Min			C-Min		None		None
Walk Time (s)				7.0			7.0				
Flash Dont Walk (s)				11.0			11.0				
Pedestrian Calls (#/hr)				0			0				
Act Effect Green (s)			42.2	42.2			20.9		13.8		13.8
Actuated g/C Ratio			0.65	0.65			0.32		0.21		0.21
v/c Ratio			0.84	0.26			0.43		0.73		0.37
Control Delay			22.4	4.9			14.9		31.4		1.8
Queue Delay			0.0	0.0			0.0		0.0		0.0
Total Delay			22.4	4.9			14.9		31.4		1.8
LOS			C	A			B		C		A
Approach Delay				13.3			14.9			22.1	
Approach LOS				B			B			C	
90th %ile Green (s)			19.7	42.7			18.5		13.3		13.3
90th %ile Term Code			Max	Coord			Coord		Max		Max
70th %ile Green (s)			19.7	40.3			16.1		15.7		15.7
70th %ile Term Code			Max	Coord			Coord		Max		Max
50th %ile Green (s)			18.6	40.8			17.7		15.2		15.2
50th %ile Term Code			Gap	Coord			Coord		Gap		Gap
30th %ile Green (s)			14.9	42.5			23.1		13.5		13.5
30th %ile Term Code			Gap	Coord			Coord		Gap		Gap
10th %ile Green (s)			11.1	44.9			29.3		11.1		11.1
10th %ile Term Code			Gap	Coord			Coord		Gap		Gap
Queue Length 50th (ft)			184	47			51		89		0
Queue Length 95th (ft)			m264	75			71		#154		0
Internal Link Dist (ft)	702			488			1034			807	
Turn Bay Length (ft)			300								
Base Capacity (vph)			632	2101			1384		683		592
Starvation Cap Reductn			0	0			0		0		0
Spillback Cap Reductn			0	0			0		0		0
Storage Cap Reductn			0	0			0		0		0
Reduced v/c Ratio			0.78	0.25			0.42		0.70		0.37
Intersection Summary											

Syncro Report - Signalized Intersections
 320: I-285 NB off-ramp & Donald Lee Hollowell Pkwy

Existing 2021 - AM
 06/27/2021

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 65

Offset: 40 (62%), Referenced to phase 2:SETL and 6:NWT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 16.4

Intersection LOS: B

Intersection Capacity Utilization 56.4%

ICU Level of Service B

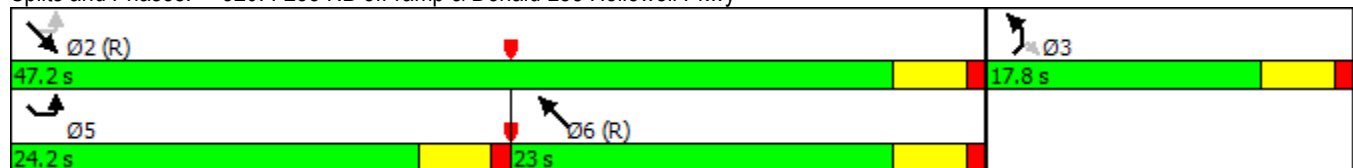
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 320: I-285 NB off-ramp & Donald Lee Hollowell Pkwy


























Existing (2021) PM Synchro Analysis Report

Synchro Report - Signalized Intersections
10: Cascade Palmetto Hwy/Fulton Ind. Blvd. & Campbellton Rd.

Existing 2021 - PM













06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	165	332	92	89	465	18	96	301	90	93	621	535
Future Volume (vph)	165	332	92	89	465	18	96	301	90	93	621	535
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	300		0	400		400	300		300
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.994				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1810	1482	1752	1761	0	1805	3438	1568	1327	2983	1468
Flt Permitted	0.142			0.433			0.274			0.476		
Satd. Flow (perm)	262	1810	1482	799	1761	0	521	3438	1568	665	2983	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127		2				127			319
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		808			851			3037			3592	
Travel Time (s)		18.4			19.3			69.0			81.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	5%	9%	3%	7%	13%	0%	5%	3%	36%	21%	10%
Adj. Flow (vph)	179	361	100	97	505	20	104	327	98	101	675	582
Shared Lane Traffic (%)												
Lane Group Flow (vph)	179	361	100	97	525	0	104	327	98	101	675	582
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Synchro Report - Signalized Intersections
10: Cascade Palmetto Hwy/Fulton Ind. Blvd. & Campbellton Rd.

Existing 2021 - PM

06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	12.0	34.4	34.4	10.6	33.0		9.6	32.8	32.8	12.2	35.4	35.4
Total Split (%)	13.3%	38.2%	38.2%	11.8%	36.7%		10.7%	36.4%	36.4%	13.6%	39.3%	39.3%
Maximum Green (s)	7.5	29.9	29.9	6.1	28.5		5.1	28.3	28.3	7.7	30.9	30.9
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes				Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effect Green (s)	37.1	31.5	31.5	33.3	27.1		29.0	25.2	25.2	32.9	27.1	27.1
Actuated g/C Ratio	0.45	0.38	0.38	0.40	0.33		0.35	0.30	0.30	0.40	0.33	0.33
v/c Ratio	0.70	0.53	0.16	0.25	0.91		0.40	0.31	0.17	0.31	0.69	0.84
Control Delay	32.6	26.7	3.1	16.2	50.9		19.9	24.0	3.2	17.8	29.0	24.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	26.7	3.1	16.2	50.9		19.9	24.0	3.2	17.8	29.0	24.3
LOS	C	C	A	B	D		B	C	A	B	C	C
Approach Delay		24.7			45.5			19.3			26.2	
Approach LOS		C			D			B			C	
90th %ile Green (s)	7.5	29.9	29.9	6.1	28.5		5.1	28.3	28.3	7.7	30.9	30.9
90th %ile Term Code	Max	Max	Max	Max	Max		Max	Hold	Hold	Max	Max	Max
70th %ile Green (s)	7.5	29.9	29.9	6.1	28.5		5.1	28.3	28.3	7.7	30.9	30.9
70th %ile Term Code	Max	Hold	Hold	Max	Max		Max	Hold	Hold	Max	Max	Max
50th %ile Green (s)	7.5	29.9	29.9	6.1	28.5		5.1	28.3	28.3	7.7	30.9	30.9
50th %ile Term Code	Max	Hold	Hold	Max	Max		Max	Hold	Hold	Max	Max	Max
30th %ile Green (s)	7.5	29.9	29.9	6.1	28.5		5.1	24.0	24.0	7.7	26.6	26.6
30th %ile Term Code	Max	Hold	Hold	Max	Max		Max	Hold	Hold	Max	Gap	Gap
10th %ile Green (s)	7.5	32.8	32.8	0.0	20.8		0.0	17.5	17.5	0.0	17.5	17.5
10th %ile Term Code	Max	Hold	Hold	Skip	Gap		Skip	Hold	Hold	Skip	Gap	Gap
Queue Length 50th (ft)	60	169	0	31	287		33	73	0	33	169	139
Queue Length 95th (ft)	#150	262	22	60	#490		64	109	22	65	231	#340
Internal Link Dist (ft)		728			771			2957			3512	
Turn Bay Length (ft)	300		300	300			400		400	300		300
Base Capacity (vph)	255	687	641	393	622		263	1204	631	326	1140	758
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.53	0.16	0.25	0.84		0.40	0.27	0.16	0.31	0.59	0.77

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 83

Natural Cycle: 90

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 28.5

Intersection LOS: C

Intersection Capacity Utilization 75.3%

ICU Level of Service D

Analysis Period (min) 15

90th %ile Actuated Cycle: 90

70th %ile Actuated Cycle: 90

50th %ile Actuated Cycle: 90









30th %ile Actuated Cycle: 85.7








10th %ile Actuated Cycle: 59.3

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 10: Cascade Palmetto Hwy/Fulton Ind. Blvd. & Campbellton Rd.

 Ø1	 Ø2	 Ø3	 Ø4
12.2 s	32.8 s	10.6 s	34.4 s
 Ø5	 Ø6	 Ø7	 Ø8
9.6 s	35.4 s	12 s	33 s








Intersection							
Int Delay, s/veh	45.9						
Movement	SEL	SER	NEL	NET	SWU	SWT	SWR
Lane Configurations							
Traffic Vol, veh/h	79	70	16	487	16	1246	39
Future Vol, veh/h	79	70	16	487	16	1246	39
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	-	Yield
Storage Length	0	100	150	-	150	-	150
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	68	68	92	92	74	74	74
Heavy Vehicles, %	10	17	13	13	6	3	28
Mvmt Flow	116	103	17	529	22	1684	53

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2026	842	1684
Stage 1	1727	-	-
Stage 2	299	-	-
Critical Hdwy	7	7.24	4.36
Critical Hdwy Stg 1	6	-	-
Critical Hdwy Stg 2	6	-	-
Follow-up Hdwy	3.6	3.47	2.33
Pot Cap-1 Maneuver	~ 45	279	330
Stage 1	118	-	-
Stage 2	703	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	~ 43	279	330
Mov Cap-2 Maneuver	~ 43	-	-
Stage 1	118	-	-
Stage 2	667	-	-

Approach	SE	NE	SW
HCM Control Delay, s	526.2	0.5	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SELn2	SWU	SWT	SWR
Capacity (veh/h)	330	-	43	279	799	-	-
HCM Lane V/C Ratio	0.053	-	2.702	0.369	0.027	-	-
HCM Control Delay (s)	16.5	-	\$ 970	25.3	9.6	-	-
HCM Lane LOS	C	-	F	D	A	-	-
HCM 95th %tile Q(veh)	0.2	-	12.6	1.6	0.1	-	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection							
Int Delay, s/veh	41.5						
Movement	SEL	SER	NEL	NET	SWU	SWT	SWR
Lane Configurations							
Traffic Vol, veh/h	71	73	10	484	4	1369	76
Future Vol, veh/h	71	73	10	484	4	1369	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	-	None
Storage Length	0	100	150	-	150	-	150
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	58	58	85	85	93	93	93
Heavy Vehicles, %	28	10	10	16	25	5	50
Mvmt Flow	122	126	12	569	4	1472	82

Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	1789	736	1472	0	415	-	0
Stage 1	1481	-	-	-	-	-	-
Stage 2	308	-	-	-	-	-	-
Critical Hdwy	7.36	7.1	4.3	-	6.9	-	-
Critical Hdwy Stg 1	6.36	-	-	-	-	-	-
Critical Hdwy Stg 2	6.36	-	-	-	-	-	-
Follow-up Hdwy	3.78	3.4	2.3	-	2.75	-	-
Pot Cap-1 Maneuver	~ 54	344	416	-	690	-	-
Stage 1	137	-	-	-	-	-	-
Stage 2	647	-	-	-	-	-	-
Platoon blocked, %				-		-	-
Mov Cap-1 Maneuver	~ 52	344	416	-	690	-	-
Mov Cap-2 Maneuver	~ 52	-	-	-	-	-	-
Stage 1	137	-	-	-	-	-	-
Stage 2	628	-	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	398.6	0.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SELn2	SWU	SWT	SWR
Capacity (veh/h)	416	-	52	344	690	-	-
HCM Lane V/C Ratio	0.028	-	2.354	0.366	0.006	-	-
HCM Control Delay (s)	13.9	-	786.5	21.4	10.2	-	-
HCM Lane LOS	B	-	F	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	12.5	1.6	0	-	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM2010 Report - Unsignalized Intersections
 30: Fulton Industrial Blvd. & Riverside Dr./Tradewater Pkwy

Existing 2021 - PM
 06/27/2021

Intersection												
Int Delay, s/veh	72.7											
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↔	↔		↔		↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	50	44	131	58	14	54	19	590	70	60	1086	38
Future Vol, veh/h	50	44	131	58	14	54	19	590	70	60	1086	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	300	-	200	300	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	91	91	91	86	86	86	89	89	89
Heavy Vehicles, %	26	0	13	7	7	4	42	12	1	2	8	40
Mvmt Flow	64	56	168	64	15	59	22	686	81	67	1220	43

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1750	2085	610	1503	2085	343	1220	0	0	686	0	0
Stage 1	1355	1355	-	730	730	-	-	-	-	-	-	-
Stage 2	395	730	-	773	1355	-	-	-	-	-	-	-
Critical Hdwy	8.02	6.5	7.16	7.64	6.64	6.98	4.94	-	-	4.14	-	-
Critical Hdwy Stg 1	7.02	5.5	-	6.64	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.02	5.5	-	6.64	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.76	4	3.43	3.57	4.07	3.34	2.62	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 42	~ 54	411	80	49	647	389	-	-	904	-	-
Stage 1	127	220	-	369	414	-	-	-	-	-	-	-
Stage 2	541	431	-	347	207	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 25	~ 47	411	-	43	647	389	-	-	904	-	-
Mov Cap-2 Maneuver	~ 25	~ 47	-	-	43	-	-	-	-	-	-	-
Stage 1	120	204	-	348	391	-	-	-	-	-	-	-
Stage 2	445	407	-	137	192	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	638.2		0.4	0.5
HCM LOS	F	-		

Minor Lane/Major Mvmt	NEL	NET	NERNWLn1	SELn1	SELn2	SWL	SWT	SWR
Capacity (veh/h)	389	-	-	-	32	411	904	-
HCM Lane V/C Ratio	0.057	-	-	-	3.766	0.409	0.075	-
HCM Control Delay (s)	14.8	-	-	\$ 1500.1	19.7	9.3	-	-
HCM Lane LOS	B	-	-	F	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-	14.2	1.9	0.2	-













Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	50	50	50	42	50	100	679	50	126	957	100
Future Volume (vph)	100	50	50	50	42	50	100	679	50	126	957	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	300		150
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.925			0.953			0.990				0.850
Flt Protected	0.950				0.983		0.950			0.950		
Satd. Flow (prot)	1128	1098	0	0	1483	0	1128	2978	0	1504	3008	897
Flt Permitted	0.456				0.844		0.188			0.289		
Satd. Flow (perm)	542	1098	0	0	1274	0	223	2978	0	458	3008	897
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			16			7				109
Link Speed (mph)		30			30			30				30
Link Distance (ft)		812			1105			708				889
Travel Time (s)		18.5			25.1			16.1				20.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	60%	60%	60%	20%	20%	20%	60%	20%	20%	20%	20%	80%
Adj. Flow (vph)	109	54	54	54	46	54	109	738	54	137	1040	109
Shared Lane Traffic (%)												
Lane Group Flow (vph)	109	108	0	0	154	0	109	792	0	137	1040	109
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	

Synchro Report - Signalized Intersections
60: Fulton Ind. Blvd. & Boat Rock Blvd./Boat Rock Rd.

Existing 2021 - PM

08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	22.5
Total Split (s)	20.2	53.2		33.0	33.0		23.0	80.4		16.4	73.8	73.8
Total Split (%)	13.5%	35.5%		22.0%	22.0%		15.3%	53.6%		10.9%	49.2%	49.2%
Maximum Green (s)	15.7	48.7		28.5	28.5		18.5	75.9		11.9	69.3	69.3
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Min		Min	Min		None	C-Min		None	C-Min	C-Min
Walk Time (s)		7.0		7.0	7.0			7.0			7.0	7.0
Flash Dont Walk (s)		11.0		11.0	11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)		0		0	0			0			0	0
Act Effct Green (s)	43.0	43.0			21.1		94.6	83.0		92.4	81.9	81.9
Actuated g/C Ratio	0.29	0.29			0.14		0.63	0.55		0.62	0.55	0.55
v/c Ratio	0.49	0.32			0.80		0.52	0.48		0.39	0.63	0.20
Control Delay	48.1	28.1			83.4		20.6	23.1		12.8	21.8	7.9
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	48.1	28.1			83.4		20.6	23.1		12.8	21.8	7.9
LOS	D	C			F		C	C		B	C	A
Approach Delay		38.2			83.4			22.8			19.7	
Approach LOS		D			F			C			B	
90th %ile Green (s)	15.7	48.7		28.5	28.5		16.8	75.9		11.9	71.0	71.0
90th %ile Term Code	Max	Hold		Max	Max		Gap	Coord		Max	Coord	Coord
70th %ile Green (s)	23.8	53.5		25.2	25.2		14.0	69.7		13.3	69.0	69.0
70th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Coord		Gap	Coord	Coord
50th %ile Green (s)	20.0	46.0		21.5	21.5		11.3	79.5		11.0	79.2	79.2
50th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Coord		Gap	Coord	Coord
30th %ile Green (s)	16.4	38.7		17.8	17.8		9.2	88.7		9.1	88.6	88.6
30th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Coord		Gap	Coord	Coord
10th %ile Green (s)	11.1	28.0		12.4	12.4		6.9	101.4		7.1	101.6	101.6
10th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Coord		Gap	Coord	Coord
Queue Length 50th (ft)	82	53			133		41	252		38	273	14
Queue Length 95th (ft)	136	106			207		74	327		102	331	50
Internal Link Dist (ft)		732			1025			628			809	
Turn Bay Length (ft)							300			300		150
Base Capacity (vph)	226	387			255		257	1676		372	1643	539
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.48	0.28			0.60		0.42	0.47		0.37	0.63	0.20
Intersection Summary												

Synchro Report - Signalized Intersections
 60: Fulton Ind. Blvd. & Boat Rock Blvd./Boat Rock Rd.

Existing 2021 - PM

08/06/2021

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 126 (84%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 26.2

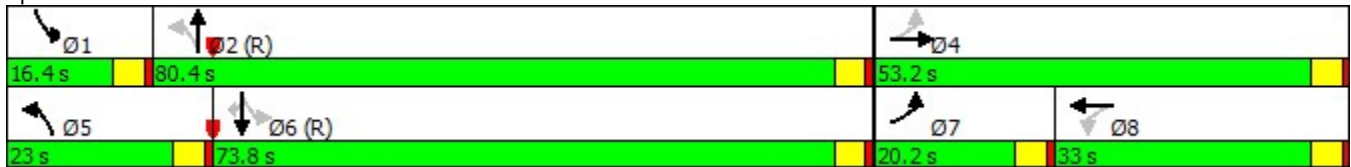
Intersection LOS: C

Intersection Capacity Utilization 57.9%

ICU Level of Service B

Analysis Period (min) 15
























Splits and Phases: 60: Fulton Ind. Blvd. & Boat Rock Blvd./Boat Rock Rd.



Synchro Report - Signalized Intersections
70: Lakeview Ct. & Fulton Ind. Blvd

Existing 2021 - PM













08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	1102	7	20	1118	31	4	0	30	32	0	7
Future Volume (vph)	9	1102	7	20	1118	31	4	0	30	32	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	300		300	0		0	0		0
Storage Lanes	1		1	1		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.850	
Flt Protected	0.950			0.950				0.950		0.950		
Satd. Flow (prot)	1081	3223	1615	1289	3252	912	0	1444	1495	1347	1252	0
Flt Permitted	0.222			0.180				0.750		0.411		
Satd. Flow (perm)	253	3223	1615	244	3252	912	0	1140	1495	583	1252	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			76			76			76		206	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		849			1099			609			533	
Travel Time (s)		19.3			25.0			13.8			12.1	
Peak Hour Factor	0.86	0.86	0.86	0.98	0.98	0.98	0.72	0.72	0.72	0.60	0.60	0.60
Heavy Vehicles (%)	67%	12%	0%	40%	11%	77%	25%	0%	8%	34%	0%	29%
Adj. Flow (vph)	10	1281	8	20	1141	32	6	0	42	53	0	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1281	8	20	1141	32	0	6	42	53	12	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	

Synchro Report - Signalized Intersections
70: Lakeview Ct. & Fulton Ind. Blvd

Existing 2021 - PM

08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	
Total Split (s)	11.0	101.0	101.0	11.0	101.0	101.0	9.5	24.0	24.0	14.0	28.5	
Total Split (%)	7.3%	67.3%	67.3%	7.3%	67.3%	67.3%	6.3%	16.0%	16.0%	9.3%	19.0%	
Maximum Green (s)	6.5	96.5	96.5	6.5	96.5	96.5	5.0	19.5	19.5	9.5	24.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effect Green (s)	119.9	117.2	117.2	121.1	119.4	119.4		6.5	6.5	20.4	20.2	
Actuated g/C Ratio	0.80	0.78	0.78	0.81	0.80	0.80		0.04	0.04	0.14	0.13	
v/c Ratio	0.04	0.51	0.01	0.08	0.44	0.04		0.12	0.31	0.39	0.03	
Control Delay	3.9	6.2	0.0	2.4	5.2	1.0		73.8	7.9	63.3	0.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	3.9	6.2	0.0	2.4	5.2	1.0		73.8	7.9	63.3	0.1	
LOS	A	A	A	A	A	A		E	A	E	A	
Approach Delay		6.2			5.1			16.2			51.7	
Approach LOS		A			A			B			D	
90th %ile Green (s)	6.5	100.3	100.3	6.9	100.7	100.7	0.0	8.2	8.2	16.6	29.3	
90th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Gap	Hold	
70th %ile Green (s)	6.0	105.2	105.2	6.3	105.5	105.5	0.0	7.0	7.0	13.5	25.0	
70th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Gap	Hold	
50th %ile Green (s)	0.0	108.5	108.5	5.9	118.9	118.9	0.0	6.2	6.2	11.4	22.1	
50th %ile Term Code	Skip	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Gap	Hold	
30th %ile Green (s)	0.0	121.8	121.8	0.0	121.8	121.8	0.0	5.5	5.5	9.2	19.2	
30th %ile Term Code	Skip	Coord	Coord	Skip	Coord	Coord	Skip	Gap	Gap	Gap	Hold	
10th %ile Green (s)	0.0	145.5	145.5	0.0	145.5	145.5	0.0	0.0	0.0	0.0	0.0	
10th %ile Term Code	Skip	Coord	Coord	Skip	Coord	Coord	Skip	Skip	Skip	Skip	Skip	
Queue Length 50th (ft)	2	170	0	1	40	0		6	0	47	0	
Queue Length 95th (ft)	m4	215	m0	m5	347	m3		18	0	56	0	
Internal Link Dist (ft)		769			1019			529			453	
Turn Bay Length (ft)	300		300	300		300						
Base Capacity (vph)	238	2517	1278	242	2588	741		148	260	143	382	
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Reduced v/c Ratio	0.04	0.51	0.01	0.08	0.44	0.04		0.04	0.16	0.37	0.03	

Intersection Summary

Synchro Report - Signalized Intersections
70: Lakeview Ct. & Fulton Ind. Blvd

Existing 2021 - PM

08/06/2021

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 15 (10%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 7.0

Intersection LOS: A

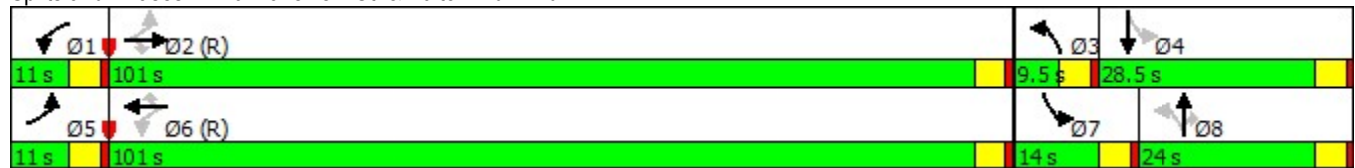
Intersection Capacity Utilization 50.0%

ICU Level of Service A

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

























Splits and Phases: 70: Lakeview Ct. & Fulton Ind. Blvd



Synchro Report - Signalized Intersections
80: Fulton Ind. Blvd & Camp Creek Pkwy

Existing 2021 - PM













08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	883	100	245	769	230	300	610	100	101	300	185
Future Volume (vph)	213	883	100	245	769	230	300	610	100	101	300	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	350		300	350		300	300		300
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			153			218			153			228
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1099			761			631			649	
Travel Time (s)		25.0			17.3			14.3			14.8	
Peak Hour Factor	0.79	0.93	0.92	0.81	0.91	0.92	0.91	0.91	0.91	0.81	0.81	0.81
Adj. Flow (vph)	270	949	109	302	845	250	330	670	110	125	370	228
Shared Lane Traffic (%)												
Lane Group Flow (vph)	270	949	109	302	845	250	330	670	110	125	370	228
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4

Synchro Report - Signalized Intersections
80: Fulton Ind. Blvd & Camp Creek Pkwy

Existing 2021 - PM

08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	12.0	24.9	24.9	13.6	26.5	26.5	14.0	27.0	27.0	9.5	22.5	22.5
Total Split (%)	16.0%	33.2%	33.2%	18.1%	35.3%	35.3%	18.7%	36.0%	36.0%	12.7%	30.0%	30.0%
Maximum Green (s)	7.5	20.4	20.4	9.1	22.0	22.0	9.5	22.5	22.5	5.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	8.4	22.6	22.6	9.5	23.7	23.7	9.5	21.8	21.8	5.2	15.4	15.4
Actuated g/C Ratio	0.11	0.30	0.30	0.13	0.32	0.32	0.13	0.29	0.29	0.07	0.21	0.21
v/c Ratio	0.70	0.62	0.19	0.69	0.76	0.39	0.76	0.65	0.19	0.53	0.51	0.45
Control Delay	48.2	24.6	5.3	37.7	23.2	5.5	44.9	26.8	2.5	42.4	28.4	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.2	24.6	5.3	37.7	23.2	5.5	44.9	26.8	2.5	42.4	28.4	6.8
LOS	D	C	A	D	C	A	D	C	A	D	C	A
Approach Delay		27.9			23.2			29.8			24.0	
Approach LOS		C			C			C			C	
90th %ile Green (s)	7.5	20.4	20.4	9.1	22.0	22.0	9.5	22.5	22.5	5.0	18.0	18.0
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Max	Max	Max	Max	Max
70th %ile Green (s)	7.5	20.4	20.4	9.1	22.0	22.0	9.5	22.5	22.5	5.0	18.0	18.0
70th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Max	Max	Max	Hold	Hold
50th %ile Green (s)	8.4	20.4	20.4	10.0	22.0	22.0	9.5	21.6	21.6	5.0	17.1	17.1
50th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Gap	Gap	Max	Hold	Hold
30th %ile Green (s)	10.3	22.3	22.3	10.7	22.7	22.7	9.5	19.0	19.0	5.0	14.5	14.5
30th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Max	Gap	Gap	Max	Hold	Hold
10th %ile Green (s)	8.5	29.4	29.4	8.8	29.7	29.7	9.3	23.3	23.3	0.0	9.5	9.5
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Gap	Hold	Hold	Skip	Gap	Gap
Queue Length 50th (ft)	84	164	8	87	204	24	77	143	0	29	78	0
Queue Length 95th (ft)	125	245	43	m87	m189	m25	#135	195	18	49	102	36
Internal Link Dist (ft)		1019			681			551			569	
Turn Bay Length (ft)	300		300	350		300	350		300	300		300
Base Capacity (vph)	386	1531	583	439	1117	649	434	1069	585	237	849	553
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.62	0.19	0.69	0.76	0.39	0.76	0.63	0.19	0.53	0.44	0.41

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 26.3

Intersection LOS: C

Intersection Capacity Utilization 63.4%

ICU Level of Service B









Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 80: Fulton Ind. Blvd & Camp Creek Pkwy

























 Ø1	 Ø2 (R)	 Ø3	 Ø4
13.6 s	24.9 s	14 s	22.5 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
12 s	26.5 s	9.5 s	27 s













Synchro Report - Signalized Intersections

Existing 2021 - PM

100: Fulton Ind. Blvd/Fulton Ind. Blvd. & Cascade Rd./Great SW Pkwy

08/06/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	50	22	327	215	10	70	99	1084	115	114	1537	8
Future Volume (vph)	50	22	327	215	10	70	99	1084	115	114	1537	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		300	300		300
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1900	1568	1736	1429	1538	1641	3252	1442	1671	3252	1380
Flt Permitted	0.751			0.714			0.050			0.145		
Satd. Flow (perm)	1399	1900	1568	1304	1429	1538	86	3252	1442	255	3252	1380
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			109			110			76
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			669			1465			1699	
Travel Time (s)		10.4			15.2			33.3			38.6	
Peak Hour Factor	0.67	0.67	0.67	0.97	0.97	0.97	0.95	0.95	0.95	0.82	0.82	0.82
Heavy Vehicles (%)	2%	0%	3%	4%	33%	5%	10%	11%	12%	8%	11%	17%
Adj. Flow (vph)	75	33	488	222	10	72	104	1141	121	139	1874	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	33	488	222	10	72	104	1141	121	139	1874	10
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	10.2	40.1	40.1	10.2	40.1	40.1	10.8	82.1	82.1	17.6	88.9	88.9
Total Split (%)	6.8%	26.7%	26.7%	6.8%	26.7%	26.7%	7.2%	54.7%	54.7%	11.7%	59.3%	59.3%
Maximum Green (s)	5.7	35.6	35.6	5.7	35.6	35.6	6.3	77.6	77.6	13.1	84.4	84.4
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	41.3	35.6	35.6	42.2	37.6	37.6	86.6	80.3	80.3	94.2	84.4	84.4
Actuated g/C Ratio	0.28	0.24	0.24	0.28	0.25	0.25	0.58	0.54	0.54	0.63	0.56	0.56
v/c Ratio	0.19	0.07	1.07	0.58	0.03	0.15	0.91	0.66	0.15	0.54	1.02	0.01
Control Delay	39.8	45.1	104.1	51.9	44.4	2.7	90.3	20.3	5.0	18.9	60.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	45.1	104.1	51.9	44.4	2.7	90.3	20.3	5.0	18.9	60.0	0.0
LOS	D	D	F	D	D	A	F	C	A	B	E	A
Approach Delay		92.7			40.0			24.3			56.9	
Approach LOS		F			D			C			E	
90th %ile Green (s)	5.7	35.6	35.6	5.7	35.6	35.6	6.3	77.6	77.6	13.1	84.4	84.4
90th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	5.7	35.6	35.6	5.7	35.6	35.6	6.3	79.1	79.1	11.6	84.4	84.4
70th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Gap	Coord	Coord
50th %ile Green (s)	5.7	35.6	35.6	5.7	35.6	35.6	6.3	80.3	80.3	10.4	84.4	84.4
50th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	5.7	35.6	35.6	5.7	35.6	35.6	6.3	81.4	81.4	9.3	84.4	84.4
30th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	0.0	35.6	35.6	5.7	45.8	45.8	6.3	83.0	83.0	7.7	84.4	84.4
10th %ile Term Code	Skip	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Gap	Coord	Coord
Queue Length 50th (ft)	53	25	~442	174	8	0	58	332	30	51	~1024	0
Queue Length 95th (ft)	70	41	348	255	25	13	#174	347	47	74	903	0
Internal Link Dist (ft)		378			589			1385			1619	
Turn Bay Length (ft)							300		300	300		300
Base Capacity (vph)	399	450	455	383	358	467	114	1740	823	285	1829	809
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.07	1.07	0.58	0.03	0.15	0.91	0.66	0.15	0.49	1.02	0.01
Intersection Summary												

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 77 (51%), Referenced to phase 2:NETL and 6:SWTL, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 50.3

Intersection LOS: D

Intersection Capacity Utilization 85.9%

ICU Level of Service E

Analysis Period (min) 15









~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 100: Fulton Ind. Blvd/Fulton Ind. Blvd. & Cascade Rd./Great SW Pkwy

 Ø1	 Ø2 (R)	 Ø3	 Ø4
17.6 s	82.1 s	10.2 s	40.1 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
10.8 s	88.9 s	10.2 s	40.1 s

Intersection												
Int Delay, s/veh	189.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	31	0	47	43	0	156	22	1191	17	67	1222	10
Future Vol, veh/h	31	0	47	43	0	156	22	1191	17	67	1222	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	0	300	-	300	250	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	46	46	46	82	82	82	97	97	97	84	84	84
Heavy Vehicles, %	0	0	9	5	0	10	33	9	53	30	11	20
Mvmt Flow	67	0	102	52	0	190	23	1228	18	80	1455	12

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2273	2887	727	2160	2887	614	1455	0	-	1228	0	0
Stage 1	1614	1614	-	1273	1273	-	-	-	-	-	-	-
Stage 2	659	1273	-	887	1614	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	7.08	7.6	6.5	7.1	4.76	-	-	4.7	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.6	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.6	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.39	3.55	4	3.4	2.53	-	-	2.5	-	-
Pot Cap-1 Maneuver	~ 22	16	351	~ 26	16	416	332	-	0	431	-	-
Stage 1	111	164	-	173	241	-	-	-	0	-	-	-
Stage 2	424	241	-	299	164	-	-	-	0	-	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	~ 10	12	351	~ 15	12	416	332	-	-	431	-	-
Mov Cap-2 Maneuver	~ 10	12	-	~ 15	12	-	-	-	-	-	-	-
Stage 1	103	134	-	161	224	-	-	-	-	-	-	-
Stage 2	214	224	-	173	134	-	-	-	-	-	-	-






















Approach	EB	WB	NB	SB
HCM Control Delay, \$ 3049.1		\$ 370.4	0.3	0.8
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1WBLn1WBLn2	SBL	SBT	SBR
Capacity (veh/h)	332	-	24 15 416	431	-	-
HCM Lane V/C Ratio	0.068	-	7.065 3.496 0.457	0.185	-	-
HCM Control Delay (s)	16.6	\$ 3049.1	\$ 1639 20.7	15.2	-	-
HCM Lane LOS	C	-	F F C C	C	-	-
HCM 95th %tile Q(veh)	0.2	-	21.2 7.4 2.3	0.7	-	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Synchro Report - Signalized Intersections
130: Great SW Pkwy













Existing 2021 - PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	1278	0	100	1250	0	50	14	0	50	106	0
Future Volume (vph)	100	1278	0	100	1250	0	50	14	0	50	106	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		250	300		300	0		0	0		0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Fr												
Flt Protected	0.950			0.950				0.962			0.984	
Satd. Flow (prot)	1770	3539	1863	1770	3539	1863	0	3405	0	0	3483	0
Flt Permitted	0.131			0.115				0.737			0.842	
Satd. Flow (perm)	244	3539	1863	214	3539	1863	0	2608	0	0	2980	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		642			731			251			574	
Travel Time (s)		14.6			16.6			5.7			13.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	1389	0	109	1359	0	54	15	0	54	115	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	109	1389	0	109	1359	0	0	69	0	0	169	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		

Synchro Report - Signalized Intersections
130: Great SW Pkwy

Existing 2021 - PM

06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5		22.5	22.5	
Total Split (s)	9.5	42.1	42.1	10.4	43.0	43.0	22.5	22.5		22.5	22.5	
Total Split (%)	12.7%	56.1%	56.1%	13.9%	57.3%	57.3%	30.0%	30.0%		30.0%	30.0%	
Maximum Green (s)	5.0	37.6	37.6	5.9	38.5	38.5	18.0	18.0		18.0	18.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5			4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0		0	0	
Act Effect Green (s)	38.8	35.0		40.2	35.7			8.9			8.9	
Actuated g/C Ratio	0.64	0.57		0.66	0.59			0.15			0.15	
v/c Ratio	0.39	0.68		0.37	0.66			0.18			0.39	
Control Delay	7.9	12.3		7.8	11.3			25.6			27.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	7.9	12.3		7.8	11.3			25.6			27.7	
LOS	A	B		A	B			C			C	
Approach Delay		12.0			11.1			25.6			27.7	
Approach LOS		B			B			C			C	
90th %ile Green (s)	5.0	37.6	37.6	5.9	38.5	38.5	11.7	11.7		11.7	11.7	
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Hold	Hold		Gap	Gap	
70th %ile Green (s)	5.0	37.6	37.6	5.9	38.5	38.5	10.1	10.1		10.1	10.1	
70th %ile Term Code	Max	Max	Max	Max	Max	Max	Hold	Hold		Gap	Gap	
50th %ile Green (s)	5.0	35.4	35.4	5.9	36.3	36.3	9.0	9.0		9.0	9.0	
50th %ile Term Code	Max	Gap	Gap	Max	Hold	Hold	Hold	Hold		Gap	Gap	
30th %ile Green (s)	5.0	29.8	29.8	5.9	30.7	30.7	7.9	7.9		7.9	7.9	
30th %ile Term Code	Max	Gap	Gap	Max	Hold	Hold	Hold	Hold		Gap	Gap	
10th %ile Green (s)	0.0	33.1	33.1	0.0	33.1	33.1	6.4	6.4		6.4	6.4	
10th %ile Term Code	Skip	Dwell	Dwell	Skip	Dwell	Dwell	Hold	Hold		Gap	Gap	
Queue Length 50th (ft)	10	187		10	173			12			32	
Queue Length 95th (ft)	24	283		28	264			30			60	
Internal Link Dist (ft)		562			651			171			494	
Turn Bay Length (ft)	300			300								
Base Capacity (vph)	282	2215		293	2269			781			893	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.39	0.63		0.37	0.60			0.09			0.19	

Intersection Summary

Area Type: Other

Synchro Report - Signalized Intersections

130: Great SW Pkwy

Existing 2021 - PM
06/27/2021

Cycle Length: 75

Actuated Cycle Length: 61

Natural Cycle: 65

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 12.7

Intersection LOS: B

Intersection Capacity Utilization 61.6%

ICU Level of Service B

Analysis Period (min) 15

90th %ile Actuated Cycle: 68.7

70th %ile Actuated Cycle: 67.1

50th %ile Actuated Cycle: 63.8

30th %ile Actuated Cycle: 57.1












10th %ile Actuated Cycle: 48.5

Splits and Phases: 130: Great SW Pkwy

 Ø1	 Ø2	 Ø4
10.4 s	42.1 s	22.5 s
 Ø5	 Ø6	 Ø8
9.5 s	43 s	22.5 s







Synchro Report - Signalized Intersections
140: Bakers Ferry Rd.

Existing 2021 - PM
06/27/2021

						
Lane Group	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	99	41	1574	125	15	1069
Future Volume (vph)	99	41	1574	125	15	1069
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		300	300	
Storage Lanes	1	0		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	0.960			0.850		
Flt Protected	0.966				0.950	
Satd. Flow (prot)	1592	0	3343	1553	1327	3139
Flt Permitted	0.966				0.081	
Satd. Flow (perm)	1592	0	3343	1553	113	3139
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	24			132		
Link Speed (mph)	30		30			30
Link Distance (ft)	676		615			670
Travel Time (s)	15.4		14.0			15.2
Peak Hour Factor	0.70	0.70	0.95	0.95	0.90	0.90
Heavy Vehicles (%)	8%	17%	8%	4%	36%	15%
Adj. Flow (vph)	141	59	1657	132	17	1188
Shared Lane Traffic (%)						
Lane Group Flow (vph)	200	0	1657	132	17	1188
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (ft)	20		100	20	20	100
Trailing Detector (ft)	0		0	0	0	0
Detector 1 Position(ft)	0		0	0	0	0
Detector 1 Size(ft)	20		6	20	20	6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6

Synchro Report - Signalized Intersections
140: Bakers Ferry Rd.

Existing 2021 - PM
06/27/2021

						
Lane Group	NBL	NBR	NET	NER	SWL	SWT
Permitted Phases				2	6	
Detector Phase	8		2	2	1	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	9.5	22.5
Total Split (s)	22.5		48.0	48.0	9.5	57.5
Total Split (%)	28.1%		60.0%	60.0%	11.9%	71.9%
Maximum Green (s)	18.0		43.5	43.5	5.0	53.0
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Min	Min	None	Min
Walk Time (s)	7.0		7.0	7.0		7.0
Flash Dont Walk (s)	11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)	0		0	0		0
Act Effect Green (s)	12.6		45.1	45.1	46.7	46.7
Actuated g/C Ratio	0.18		0.66	0.66	0.68	0.68
v/c Ratio	0.64		0.75	0.12	0.10	0.55
Control Delay	32.7		12.8	1.9	5.6	7.2
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	32.7		12.8	1.9	5.6	7.2
LOS	C		B	A	A	A
Approach Delay	32.7		12.0			7.2
Approach LOS	C		B			A
90th %ile Green (s)	18.0		43.5	43.5	5.0	53.0
90th %ile Term Code	Max		Max	Max	Max	Hold
70th %ile Green (s)	14.7		43.5	43.5	0.0	43.5
70th %ile Term Code	Gap		Max	Max	Skip	Hold
50th %ile Green (s)	12.6		45.2	45.2	0.0	45.2
50th %ile Term Code	Gap		Dwell	Dwell	Skip	Dwell
30th %ile Green (s)	10.8		47.1	47.1	0.0	47.1
30th %ile Term Code	Gap		Dwell	Dwell	Skip	Dwell
10th %ile Green (s)	7.9		44.1	44.1	0.0	44.1
10th %ile Term Code	Gap		Dwell	Dwell	Skip	Dwell
Queue Length 50th (ft)	66		187	0	2	109
Queue Length 95th (ft)	103		#548	23	9	197
Internal Link Dist (ft)	596		535			590
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	439		2202	1068	166	2451
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.46		0.75	0.12	0.10	0.48
Intersection Summary						

Synchro Report - Signalized Intersections
140: Bakers Ferry Rd.

Existing 2021 - PM
06/27/2021

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 68.4

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 11.5

Intersection LOS: B

Intersection Capacity Utilization 59.0%

ICU Level of Service B

Analysis Period (min) 15

90th %ile Actuated Cycle: 80

70th %ile Actuated Cycle: 67.2

50th %ile Actuated Cycle: 66.8

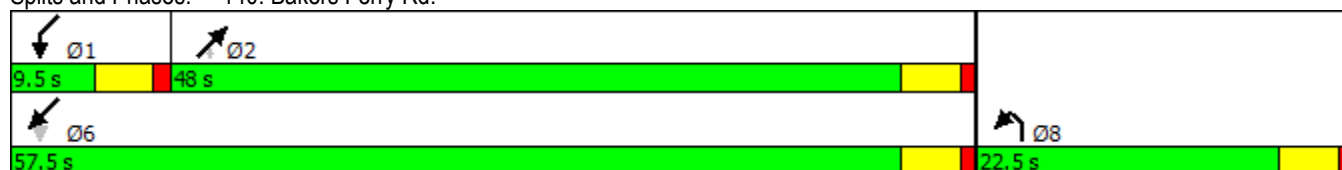
30th %ile Actuated Cycle: 66.9

10th %ile Actuated Cycle: 61

95th percentile volume exceeds capacity, queue may be longer.




















Queue shown is maximum after two cycles.

Splits and Phases: 140: Bakers Ferry Rd.















Synchro Report - Signalized Intersections
150: Mendel Dr./Wharton Dr.

Existing 2021 - PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	134	14	38	28	8	55	22	1592	13	57	998	50
Future Volume (vph)	134	14	38	28	8	55	22	1592	13	57	998	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	300		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Frt		0.890			0.918			0.999			0.993	
Flt Protected	0.950				0.985		0.950			0.950		
Satd. Flow (prot)	1626	1446	0	0	1519	0	1357	4840	0	1687	4477	0
Flt Permitted	0.751				0.895		0.950			0.950		
Satd. Flow (perm)	1285	1446	0	0	1381	0	1357	4840	0	1687	4477	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		63			69			2			15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		409			537			753			584	
Travel Time (s)		9.3			12.2			17.1			13.3	
Peak Hour Factor	0.60	0.60	0.60	0.80	0.80	0.80	0.96	0.96	0.96	0.94	0.94	0.94
Heavy Vehicles (%)	11%	14%	18%	14%	38%	9%	33%	7%	15%	7%	15%	16%
Adj. Flow (vph)	223	23	63	35	10	69	23	1658	14	61	1062	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	223	86	0	0	114	0	23	1672	0	61	1115	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	

Synchro Report - Signalized Intersections
150: Mendel Dr./Wharton Dr.

Existing 2021 - PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	22.6	22.6		22.6	22.6		9.6	27.8		9.6	27.8	
Total Split (%)	37.7%	37.7%		37.7%	37.7%		16.0%	46.3%		16.0%	46.3%	
Maximum Green (s)	18.1	18.1		18.1	18.1		5.1	23.3		5.1	23.3	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effect Green (s)	13.9	13.9			13.9		5.2	26.3		5.2	29.9	
Actuated g/C Ratio	0.25	0.25			0.25		0.10	0.48		0.10	0.55	
v/c Ratio	0.68	0.21			0.28		0.18	0.72		0.38	0.45	
Control Delay	29.9	8.4			10.0		28.9	16.2		32.6	9.5	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	29.9	8.4			10.0		28.9	16.2		32.6	9.5	
LOS	C	A			B		C	B		C	A	
Approach Delay		23.9			10.0			16.4			10.7	
Approach LOS		C			B			B			B	
90th %ile Green (s)	18.1	18.1		18.1	18.1		5.1	23.3		5.1	23.3	
90th %ile Term Code	Max	Max		Hold	Hold		Max	Max		Max	Max	
70th %ile Green (s)	18.1	18.1		18.1	18.1		0.0	23.3		5.1	32.9	
70th %ile Term Code	Max	Max		Hold	Hold		Skip	Max		Max	Hold	
50th %ile Green (s)	14.8	14.8		14.8	14.8		0.0	23.3		5.1	32.9	
50th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Max		Max	Hold	
30th %ile Green (s)	10.5	10.5		10.5	10.5		0.0	23.3		0.0	23.3	
30th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Max		Skip	Hold	
10th %ile Green (s)	8.6	8.6		8.6	8.6		0.0	36.3		0.0	36.3	
10th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Dwell		Skip	Dwell	
Queue Length 50th (ft)	67	6			12		7	178		20	66	
Queue Length 95th (ft)	77	15			36		27	#295		#55	154	
Internal Link Dist (ft)		329			457			673			504	
Turn Bay Length (ft)							300			300		
Base Capacity (vph)	432	528			509		128	2329		159	2455	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.52	0.16			0.22		0.18	0.72		0.38	0.45	
Intersection Summary												

Synchro Report - Signalized Intersections
150: Mendel Dr./Wharton Dr.

Existing 2021 - PM
06/27/2021

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 54.7

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 14.9

Intersection LOS: B

Intersection Capacity Utilization 60.6%

ICU Level of Service B

Analysis Period (min) 15

90th %ile Actuated Cycle: 60

70th %ile Actuated Cycle: 60

50th %ile Actuated Cycle: 56.7







30th %ile Actuated Cycle: 42.8

10th %ile Actuated Cycle: 53.9

95th percentile volume exceeds capacity, queue may be longer.





















Queue shown is maximum after two cycles.













Splits and Phases: 150: Mendel Dr./Wharton Dr.

 Ø1	 Ø2	 Ø4
9.6 s	27.8 s	22.6 s
 Ø5	 Ø6	 Ø8
9.6 s	27.8 s	22.6 s

Synchro Report - Signalized Intersections
160: Marvin Miller Dr.

Existing 2021 - PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	41	0	9	3	0	5	17	1818	7	3	1084	21
Future Volume (vph)	41	0	9	3	0	5	17	1818	7	3	1084	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		250	200		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Frt		0.976			0.913				0.850		0.997	
Flt Protected		0.961			0.982		0.950			0.950		
Satd. Flow (prot)	0	1411	0	0	905	0	1444	4803	868	902	4422	0
Flt Permitted					0.878		0.950			0.950		
Satd. Flow (perm)	0	1468	0	0	809	0	1444	4803	868	902	4422	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		101			101				101		5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		720			447			1232			950	
Travel Time (s)		16.4			10.2			28.0			21.6	
Peak Hour Factor	0.74	0.74	0.74	0.55	0.55	0.55	0.96	0.96	0.96	0.85	0.85	0.85
Heavy Vehicles (%)	29%	0%	14%	67%	0%	100%	25%	8%	86%	100%	17%	14%
Adj. Flow (vph)	55	0	12	5	0	9	18	1894	7	4	1275	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	0	0	14	0	18	1894	7	4	1300	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	
Protected Phases		4			8		5	2		1	6	

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	4			8					2			
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5	22.5	9.5	22.5	
Total Split (s)	22.5	22.5		22.5	22.5		9.5	33.0	33.0	9.5	33.0	
Total Split (%)	34.6%	34.6%		34.6%	34.6%		14.6%	50.8%	50.8%	14.6%	50.8%	
Maximum Green (s)	18.0	18.0		18.0	18.0		5.0	28.5	28.5	5.0	28.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		None	Min	Min	Min	None	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	
Act Effect Green (s)		6.0			6.0		5.1	28.3	28.3	5.1	38.4	
Actuated g/C Ratio		0.12			0.12		0.11	0.58	0.58	0.11	0.79	
v/c Ratio		0.25			0.07		0.12	0.67	0.01	0.04	0.37	
Control Delay		5.4			0.8		24.4	9.5	0.0	23.3	4.2	
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		5.4			0.8		24.4	9.5	0.0	23.3	4.2	
LOS		A			A		C	A	A	C	A	
Approach Delay		5.4			0.8			9.6			4.2	
Approach LOS		A			A			A			A	
90th %ile Green (s)	7.6	7.6		7.6	7.6		5.0	28.5	28.5	5.0	28.5	
90th %ile Term Code	Gap	Gap		Hold	Hold		Max	Max	Max	Max	Max	
70th %ile Green (s)	5.5	5.5		5.5	5.5		0.0	28.5	28.5	5.0	38.0	
70th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Max	Max	Max	Hold	
50th %ile Green (s)	5.5	5.5		5.5	5.5		0.0	28.5	28.5	5.0	38.0	
50th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Max	Max	Max	Hold	
30th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	28.5	28.5	5.0	38.0	
30th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Max	Max	Max	Hold	
10th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	25.9	25.9	5.0	35.4	
10th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Gap	Gap	Max	Hold	
Queue Length 50th (ft)		0			0		5	143	0	1	39	
Queue Length 95th (ft)		8			0		22	212	0	8	117	
Internal Link Dist (ft)		640			367			1152			870	
Turn Bay Length (ft)							250		250	200		
Base Capacity (vph)		617			368		151	2874	560	94	3512	
Starvation Cap Reductn		0			0		0	0	0	0	0	
Spillback Cap Reductn		0			0		0	0	0	0	0	
Storage Cap Reductn		0			0		0	0	0	0	0	
Reduced v/c Ratio		0.11			0.04		0.12	0.66	0.01	0.04	0.37	
Intersection Summary												

Synchro Report - Signalized Intersections
160: Marvin Miller Dr.

Existing 2021 - PM
06/27/2021

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 48.4

Natural Cycle: 65

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 7.3

Intersection LOS: A

Intersection Capacity Utilization 48.2%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 54.6

70th %ile Actuated Cycle: 52.5

50th %ile Actuated Cycle: 52.5

30th %ile Actuated Cycle: 42.5

10th %ile Actuated Cycle: 39.9
























Splits and Phases: 160: Marvin Miller Dr.













 Ø1	 Ø2	 Ø4
9.5 s	33 s	22.5 s
 Ø5	 Ø6	 Ø8
9.5 s	33 s	22.5 s

Synchro Report - Signalized Intersections
170: Patton Dr.

Existing 2021 - PM

06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations								  			  	
Traffic Volume (vph)	30	30	0	0	250	219	64	1800	0	35	1108	0
Future Volume (vph)	30	30	0	0	250	219	64	1800	0	35	1108	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		0	300		0
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frt					0.937							
Flt Protected		0.976					0.950			0.950		
Satd. Flow (prot)	0	1545	0	0	1484	0	1504	4322	0	1504	4322	1583
Flt Permitted		0.497					0.950			0.950		
Satd. Flow (perm)	0	787	0	0	1484	0	1504	4322	0	1504	4322	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					52							
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		749			928			950			975	
Travel Time (s)		17.0			21.1			21.6			22.2	
Peak Hour Factor	0.79	0.79	0.79	0.90	0.90	0.90	0.96	0.96	0.96	0.73	0.73	0.73
Heavy Vehicles (%)	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Adj. Flow (vph)	38	38	0	0	278	243	67	1875	0	48	1518	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	76	0	0	521	0	67	1875	0	48	1518	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA			NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	4			8								6
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	22.5
Total Split (s)	34.5	34.5		34.5	34.5		11.8	45.9		9.6	43.7	43.7
Total Split (%)	38.3%	38.3%		38.3%	38.3%		13.1%	51.0%		10.7%	48.6%	48.6%
Maximum Green (s)	30.0	30.0		30.0	30.0		7.3	41.4		5.1	39.2	39.2
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0			0	0
Act Effect Green (s)		30.1			30.1		7.0	41.5		5.1	39.8	
Actuated g/C Ratio		0.34			0.34		0.08	0.47		0.06	0.45	
v/c Ratio		0.28			0.96		0.57	0.92		0.55	0.78	
Control Delay		25.9			59.1		59.5	31.4		66.1	24.5	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		25.9			59.1		59.5	31.4		66.1	24.5	
LOS		C			E		E	C		E	C	
Approach Delay		25.9			59.1			32.4			25.8	
Approach LOS		C			E			C			C	
90th %ile Green (s)	30.0	30.0		30.0	30.0		7.3	41.4		5.1	39.2	39.2
90th %ile Term Code	Hold	Hold		Max	Max		Max	Max		Max	Max	Max
70th %ile Green (s)	30.0	30.0		30.0	30.0		7.3	41.4		5.1	39.2	39.2
70th %ile Term Code	Hold	Hold		Max	Max		Max	Max		Max	Max	Max
50th %ile Green (s)	30.0	30.0		30.0	30.0		7.3	41.4		5.1	39.2	39.2
50th %ile Term Code	Hold	Hold		Max	Max		Max	Max		Max	Max	Max
30th %ile Green (s)	30.0	30.0		30.0	30.0		7.3	41.4		5.1	39.2	39.2
30th %ile Term Code	Hold	Hold		Max	Max		Max	Max		Max	Max	Max
10th %ile Green (s)	30.0	30.0		30.0	30.0		0.0	41.4		0.0	41.4	41.4
10th %ile Term Code	Hold	Hold		Max	Max		Skip	Max		Skip	Hold	Hold
Queue Length 50th (ft)		32			268		37	359		27	267	
Queue Length 95th (ft)		59			#481		#91	#480		#54	236	
Internal Link Dist (ft)		669			848			870			895	
Turn Bay Length (ft)							200			300		
Base Capacity (vph)		268			540		124	2035		87	1951	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.28			0.96		0.54	0.92		0.55	0.78	
Intersection Summary												

Synchro Report - Signalized Intersections
170: Patton Dr.

Existing 2021 - PM
06/27/2021

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 88.1

Natural Cycle: 90

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 33.2

Intersection LOS: C

Intersection Capacity Utilization 78.5%

ICU Level of Service D

Analysis Period (min) 15

90th %ile Actuated Cycle: 90

70th %ile Actuated Cycle: 90

50th %ile Actuated Cycle: 90

30th %ile Actuated Cycle: 90

10th %ile Actuated Cycle: 80.4

95th percentile volume exceeds capacity, queue may be longer.



















Queue shown is maximum after two cycles.

Splits and Phases: 170: Patton Dr.

 Ø1	 Ø2	 Ø4
9.6 s	45.9 s	34.5 s
 Ø5	 Ø6	 Ø8
11.8 s	43.7 s	34.5 s













Synchro Report - Signalized Intersections
180: Commerce Cir.

Existing 2021 - PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	27	2031	5	91	1120	14	76	4	20	15	5	82
Future Volume (vph)	27	2031	5	91	1120	14	76	4	20	15	5	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998			0.973			0.891	
Flt Protected	0.950			0.950				0.964			0.993	
Satd. Flow (prot)	1805	4802	0	1770	5534	0	0	1726	0	0	1650	0
Flt Permitted	0.950			0.950				0.522			0.952	
Satd. Flow (perm)	1805	4802	0	1770	5534	0	0	934	0	0	1581	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			4			11			121	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		760			245			480			470	
Travel Time (s)		17.3			5.6			10.9			10.7	
Peak Hour Factor	0.96	0.96	0.96	0.84	0.84	0.84	0.85	0.85	0.85	0.68	0.68	0.68
Heavy Vehicles (%)	0%	8%	20%	2%	18%	7%	3%	0%	5%	13%	0%	0%
Adj. Flow (vph)	28	2116	5	108	1333	17	89	5	24	22	7	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	2121	0	108	1350	0	0	118	0	0	150	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	

Synchro Report - Signalized Intersections
180: Commerce Cir.

Existing 2021 - PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	10.3	60.0		16.0	65.7		24.0	24.0		24.0	24.0	
Total Split (%)	10.3%	60.0%		16.0%	65.7%		24.0%	24.0%		24.0%	24.0%	
Maximum Green (s)	5.8	55.5		11.5	61.2		19.5	19.5		19.5	19.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	6.2	61.4		10.4	69.7			14.8			14.8	
Actuated g/C Ratio	0.06	0.61		0.10	0.70			0.15			0.15	
v/c Ratio	0.25	0.72		0.59	0.35			0.80			0.45	
Control Delay	50.5	16.3		54.1	7.1			72.8			14.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	50.5	16.3		54.1	7.1			72.8			14.6	
LOS	D	B		D	A			E			B	
Approach Delay		16.7			10.5			72.8			14.6	
Approach LOS		B			B			E			B	
90th %ile Green (s)	5.8	55.5		11.5	61.2		19.5	19.5		19.5	19.5	
90th %ile Term Code	Max	Coord		Max	Coord		Max	Max		Hold	Hold	
70th %ile Green (s)	6.6	55.5		12.3	61.2		18.7	18.7		18.7	18.7	
70th %ile Term Code	Max	Coord		Max	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	7.0	59.5		11.4	63.9		15.6	15.6		15.6	15.6	
50th %ile Term Code	Gap	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	0.0	64.5		9.6	78.6		12.4	12.4		12.4	12.4	
30th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	0.0	71.9		7.0	83.4		7.6	7.6		7.6	7.6	
10th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)	17	333		73	85			66			16	
Queue Length 95th (ft)	46	439		122	89			#117			34	
Internal Link Dist (ft)		680			165			400			390	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	112	2947		206	3856			190			405	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.25	0.72		0.52	0.35			0.62			0.37	
Intersection Summary												

Synchro Report - Signalized Intersections

180: Commerce Cir.

Existing 2021 - PM
06/27/2021

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 71 (71%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 16.0

Intersection LOS: B

Intersection Capacity Utilization 68.0%

ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 180: Commerce Cir.



Synchro Report - Unsignalized Intersections
190: Fulton Ind. Circle

Existing 2021 - PM
06/27/2021





















Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↑
Traffic Volume (vph)	0	2225	1185	65	0	40
Future Volume (vph)	0	2225	1185	65	0	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.86	0.86	0.86	1.00	1.00
Frt			0.987			0.865
Flt Protected						
Satd. Flow (prot)	0	6052	5564	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	6052	5564	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		245	541		662	
Travel Time (s)		5.6	12.3		15.0	
Peak Hour Factor	0.97	0.97	0.84	0.48	0.88	0.88
Heavy Vehicles (%)	8%	8%	17%	5%	2%	2%
Adj. Flow (vph)	0	2294	1411	135	0	45
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2294	1546	0	0	45
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	35.6%
Analysis Period (min)	15
	ICU Level of Service A


Synchro Report - Signalized Intersections
200: Shirley Dr.

Existing 2021 - PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	2223	14	73	1249	7	15	0	125	9	0	1
Future Volume (vph)	10	2223	14	73	1249	7	15	0	125	9	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.999			0.880			0.984	
Flt Protected	0.950			0.950				0.995			0.958	
Satd. Flow (prot)	1805	6044	0	1388	5633	0	0	1571	0	0	1629	0
Flt Permitted	0.950			0.950				0.959			0.454	
Satd. Flow (perm)	1805	6044	0	1388	5633	0	0	1514	0	0	772	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			2			154			115	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		541			537			437			323	
Travel Time (s)		12.3			12.2			9.9			7.3	
Peak Hour Factor	0.92	0.92	0.92	0.85	0.85	0.85	0.81	0.81	0.81	0.61	0.61	0.61
Heavy Vehicles (%)	0%	8%	14%	30%	16%	0%	13%	0%	5%	11%	2%	2%
Adj. Flow (vph)	11	2416	15	86	1469	8	19	0	154	15	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	2431	0	86	1477	0	0	173	0	0	17	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	

Synchro Report - Signalized Intersections
200: Shirley Dr.

Existing 2021 - PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	10.0	58.6		18.2	66.8		23.2	23.2		23.2	23.2	
Total Split (%)	10.0%	58.6%		18.2%	66.8%		23.2%	23.2%		23.2%	23.2%	
Maximum Green (s)	5.5	54.1		13.7	62.3		18.7	18.7		18.7	18.7	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	C-Max		Min	C-Max		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	6.2	66.8		11.5	72.0			8.3			8.3	
Actuated g/C Ratio	0.06	0.67		0.12	0.72			0.08			0.08	
v/c Ratio	0.10	0.60		0.54	0.36			0.65			0.10	
Control Delay	52.0	3.2		66.0	1.9			21.3			1.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	52.0	3.2		66.0	1.9			21.3			1.2	
LOS	D	A		E	A			C			A	
Approach Delay		3.4			5.4			21.3			1.2	
Approach LOS		A			A			C			A	
90th %ile Green (s)	7.4	56.2		16.4	65.2		13.9	13.9		13.9	13.9	
90th %ile Term Code	Gap	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
70th %ile Green (s)	6.6	63.3		13.5	70.2		9.7	9.7		9.7	9.7	
70th %ile Term Code	Gap	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	6.0	68.2		11.5	73.7		6.8	6.8		6.8	6.8	
50th %ile Term Code	Gap	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	5.5	71.6		9.4	75.5		5.5	5.5		5.5	5.5	
30th %ile Term Code	Gap	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	5.5	74.5		6.5	75.5		5.5	5.5		5.5	5.5	
10th %ile Term Code	Gap	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)	7	36		57	25			12			0	
Queue Length 95th (ft)	m11	51		m81	44			54			0	
Internal Link Dist (ft)		461			457			357			243	
Turn Bay Length (ft)	300			150								
Base Capacity (vph)	112	4035		197	4057			408			237	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.10	0.60		0.44	0.36			0.42			0.07	
Intersection Summary												

Synchro Report - Signalized Intersections

200: Shirley Dr.

Existing 2021 - PM

06/27/2021

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 90 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 4.9

Intersection LOS: A

Intersection Capacity Utilization 56.1%

ICU Level of Service B

Analysis Period (min) 15




















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Shirley Dr.















Synchro Report - Signalized Intersections
210: I-20 EB Ramp

Existing 2021 - PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	251	0	174	0	0	0	0	1057	1178	409	1320	0
Future Volume (vph)	251	0	174	0	0	0	0	1057	1178	409	1320	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	225		0	0		0
Storage Lanes	2		1	0		0	0		2	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.88	1.00	0.91	1.00
Frt			0.850						0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	3183	0	1346	0	0	0	0	6052	2608	1736	4510	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	3183	0	1346	0	0	0	0	6052	2608	1736	4510	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			88						806			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		758			734			537			524	
Travel Time (s)		17.2			16.7			12.2			11.9	
Peak Hour Factor	0.84	0.84	0.84	0.92	0.92	0.92	0.84	0.84	0.84	0.91	0.91	0.91
Heavy Vehicles (%)	10%	0%	20%	2%	2%	2%	0%	8%	9%	4%	15%	0%
Adj. Flow (vph)	299	0	207	0	0	0	0	1258	1402	449	1451	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	299	0	207	0	0	0	0	1258	1402	449	1451	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1					2	1	1	2	
Detector Template	Left		Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20		20					100	20	20	100	
Trailing Detector (ft)	0		0					0	0	0	0	
Detector 1 Position(ft)	0		0					0	0	0	0	
Detector 1 Size(ft)	20		20					6	20	20	6	
Detector 1 Type	Cl+Ex		Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Prot		Perm					NA	Perm	Prot	NA	
Protected Phases	7							2		1	6	

Synchro Report - Signalized Intersections
210: I-20 EB Ramp

Existing 2021 - PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases			7						2			
Detector Phase	7		7					2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0		5.0					5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5		9.5					22.5	22.5	9.5	22.5	
Total Split (s)	19.0		19.0					47.0	47.0	34.0	81.0	
Total Split (%)	19.0%		19.0%					47.0%	47.0%	34.0%	81.0%	
Maximum Green (s)	14.5		14.5					42.5	42.5	29.5	76.5	
Yellow Time (s)	3.5		3.5					3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0		1.0					1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5		4.5					4.5	4.5	4.5	4.5	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0		3.0					3.0	3.0	3.0	3.0	
Recall Mode	None		None					C-Min	C-Min	None	C-Min	
Walk Time (s)								7.0	7.0		7.0	
Flash Dont Walk (s)								11.0	11.0		11.0	
Pedestrian Calls (#/hr)								0	0		0	
Act Effect Green (s)	13.4		13.4					44.9	44.9	28.2	77.6	
Actuated g/C Ratio	0.13		0.13					0.45	0.45	0.28	0.78	
v/c Ratio	0.70		0.81					0.46	0.87	0.92	0.41	
Control Delay	50.8		48.1					11.1	11.4	48.8	2.6	
Queue Delay	0.0		0.0					0.0	7.6	0.0	0.2	
Total Delay	50.8		48.1					11.1	19.0	48.8	2.8	
LOS	D		D					B	B	D	A	
Approach Delay		49.7						15.3			13.7	
Approach LOS		D						B			B	
90th %ile Green (s)	14.5		14.5					42.5	42.5	29.5	76.5	
90th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
70th %ile Green (s)	14.5		14.5					42.5	42.5	29.5	76.5	
70th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
50th %ile Green (s)	14.5		14.5					42.5	42.5	29.5	76.5	
50th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
30th %ile Green (s)	12.9		12.9					44.7	44.7	28.9	78.1	
30th %ile Term Code	Gap		Gap					Coord	Coord	Gap	Coord	
10th %ile Green (s)	10.5		10.5					52.3	52.3	23.7	80.5	
10th %ile Term Code	Gap		Gap					Coord	Coord	Gap	Coord	
Queue Length 50th (ft)	93		73					71	28	247	45	
Queue Length 95th (ft)	128		#159					74	97	m#397	32	
Internal Link Dist (ft)		678			654			457			444	
Turn Bay Length (ft)												
Base Capacity (vph)	461		270					2717	1614	512	3500	
Starvation Cap Reductn	0		0					0	188	0	1065	
Spillback Cap Reductn	0		0					0	0	0	0	
Storage Cap Reductn	0		0					0	0	0	0	
Reduced v/c Ratio	0.65		0.77					0.46	0.98	0.88	0.60	

Intersection Summary

Synchro Report - Signalized Intersections

210: I-20 EB Ramp

Existing 2021 - PM

06/27/2021

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 97 (97%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 18.1

Intersection LOS: B

Intersection Capacity Utilization 82.3%

ICU Level of Service E

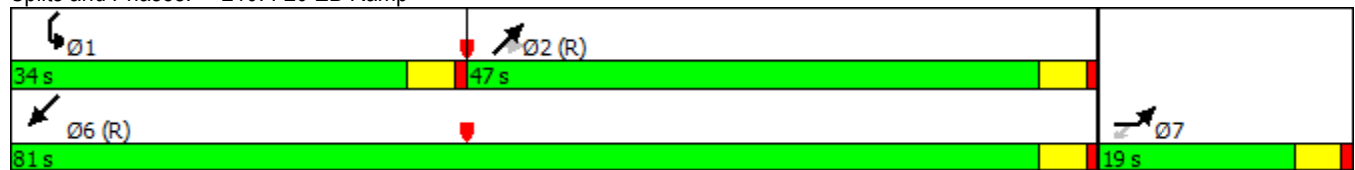
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 210: I-20 EB Ramp



Synchro Report - Signalized Intersections
220: I-20 WB Ramp

Existing 2021 - PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	520	0	265	305	978	0	0	1189	873
Future Volume (vph)	0	0	0	520	0	265	305	978	0	0	1189	873
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		400	0		0	0		0
Storage Lanes	0		0	3		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.94	1.00	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Frt						0.850					0.936	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	4545	0	1524	1517	4715	0	0	5801	0
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	4545	0	1524	1517	4715	0	0	5801	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						161					223	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		487			795			524			744	
Travel Time (s)		11.1			18.1			11.9			16.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	12%	2%	6%	19%	10%	2%	16%	8%	2%
Adj. Flow (vph)	0	0	0	565	0	288	332	1063	0	0	1292	949
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	565	0	288	332	1063	0	0	2241	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		36			36			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	
Detector Template				Left		Right	Left	Thru			Thru	
Leading Detector (ft)				20		20	20	100			100	
Trailing Detector (ft)				0		0	0	0			0	
Detector 1 Position(ft)				0		0	0	0			0	
Detector 1 Size(ft)				20		20	20	6			6	
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Prot		Perm	Prot	NA			NA	
Protected Phases				3			5	2			6	

Synchro Report - Signalized Intersections
220: I-20 WB Ramp

Existing 2021 - PM
06/27/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases						8						
Detector Phase				3		8	5	2			6	
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	
Minimum Split (s)				9.5		22.5	9.5	22.5			22.5	
Total Split (s)				22.6		22.6	32.4	77.4			45.0	
Total Split (%)				22.6%		22.6%	32.4%	77.4%			45.0%	
Maximum Green (s)				18.1		18.1	27.9	72.9			40.5	
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	
Recall Mode				None		None	None	C-Min			C-Min	
Walk Time (s)						7.0		7.0			7.0	
Flash Dont Walk (s)						11.0		11.0			11.0	
Pedestrian Calls (#/hr)						0		0			0	
Act Effect Green (s)				16.7		16.7	25.2	74.3			44.6	
Actuated g/C Ratio				0.17		0.17	0.25	0.74			0.45	
v/c Ratio				0.75		0.74	0.87	0.30			1.13dr	
Control Delay				46.2		29.7	47.7	1.4			17.1	
Queue Delay				0.0		0.0	0.0	0.0			0.0	
Total Delay				46.2		29.7	47.7	1.4			17.1	
LOS				D		C	D	A			B	
Approach Delay					40.6			12.4			17.1	
Approach LOS					D			B			B	
90th %ile Green (s)				18.1		18.1	27.9	72.9			40.5	
90th %ile Term Code				Max		Max	Max	Coord			Coord	
70th %ile Green (s)				18.1		18.1	27.9	72.9			40.5	
70th %ile Term Code				Max		Max	Max	Coord			Coord	
50th %ile Green (s)				17.5		17.5	27.5	73.5			41.5	
50th %ile Term Code				Gap		Hold	Gap	Coord			Coord	
30th %ile Green (s)				16.0		16.0	24.0	75.0			46.5	
30th %ile Term Code				Gap		Hold	Gap	Coord			Coord	
10th %ile Green (s)				13.6		13.6	18.7	77.4			54.2	
10th %ile Term Code				Gap		Hold	Gap	Coord			Coord	
Queue Length 50th (ft)				121		75	167	0			314	
Queue Length 95th (ft)				159		#173	#330	0			397	
Internal Link Dist (ft)		407			715			444			664	
Turn Bay Length (ft)						400						
Base Capacity (vph)				822		407	423	3505			2713	
Starvation Cap Reductn				0		0	0	0			0	
Spillback Cap Reductn				0		0	0	0			0	
Storage Cap Reductn				0		0	0	0			0	
Reduced v/c Ratio				0.69		0.71	0.78	0.30			0.83	

Intersection Summary

Synchro Report - Signalized Intersections

220: I-20 WB Ramp

Existing 2021 - PM

06/27/2021

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 44 (44%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 20.1

Intersection LOS: C

Intersection Capacity Utilization 82.3%

ICU Level of Service E



Analysis Period (min) 15



















95th percentile volume exceeds capacity, queue may be longer.













Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 220: I-20 WB Ramp

 Ø2 (L)	 Ø3
77.4 s	22.6 s
 Ø5	 Ø8
32.4 s	22.6 s

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	39	1182	131	30	1598	5	48	13	50	121	16	35
Future Volume (vph)	39	1182	131	30	1598	5	48	13	50	121	16	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	200		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.982			0.999			0.946			0.976	
Flt Protected	0.950			0.950				0.975			0.967	
Satd. Flow (prot)	1399	4771	0	1805	4756	0	0	1673	0	0	1725	0
Flt Permitted	0.116			0.150				0.773			0.670	
Satd. Flow (perm)	171	4771	0	285	4756	0	0	1326	0	0	1195	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		52			1			31			10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			1498			395			449	
Travel Time (s)		16.9			34.0			9.0			10.2	
Peak Hour Factor	0.58	0.92	0.76	0.78	0.97	0.69	0.56	0.80	0.73	0.78	0.50	0.88
Heavy Vehicles (%)	29%	7%	5%	0%	9%	0%	0%	8%	10%	5%	0%	3%
Adj. Flow (vph)	67	1285	172	38	1647	7	86	16	68	155	32	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	1457	0	38	1654	0	0	170	0	0	227	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	71.8	71.8		71.8	71.8		28.2	28.2		28.2	28.2	
Total Split (%)	71.8%	71.8%		71.8%	71.8%		28.2%	28.2%		28.2%	28.2%	
Maximum Green (s)	67.3	67.3		67.3	67.3		23.7	23.7		23.7	23.7	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)	69.7	69.7		69.7	69.7			21.3			21.3	
Actuated g/C Ratio	0.70	0.70		0.70	0.70			0.21			0.21	
v/c Ratio	0.56	0.44		0.19	0.50			0.56			0.87	
Control Delay	26.3	2.3		2.0	2.0			35.3			67.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	26.3	2.3		2.0	2.0			35.3			67.0	
LOS	C	A		A	A			D			E	
Approach Delay		3.4			2.0			35.3			67.0	
Approach LOS		A			A			D			E	
90th %ile Green (s)	67.3	67.3		67.3	67.3		23.7	23.7		23.7	23.7	
90th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Max	Max	
70th %ile Green (s)	67.3	67.3		67.3	67.3		23.7	23.7		23.7	23.7	
70th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Max	Max	
50th %ile Green (s)	67.3	67.3		67.3	67.3		23.7	23.7		23.7	23.7	
50th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Max	Max	
30th %ile Green (s)	70.6	70.6		70.6	70.6		20.4	20.4		20.4	20.4	
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
10th %ile Green (s)	76.2	76.2		76.2	76.2		14.8	14.8		14.8	14.8	
10th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
Queue Length 50th (ft)	7	50		2	28			76			130	
Queue Length 95th (ft)	31	61		m2	m26			122			103	
Internal Link Dist (ft)		664			1418			315			369	
Turn Bay Length (ft)	150			200								
Base Capacity (vph)	119	3342		198	3317			337			290	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.56	0.44		0.19	0.50			0.50			0.78	
Intersection Summary												

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 22 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 8.2

Intersection LOS: A





Intersection Capacity Utilization 55.5%

ICU Level of Service B

Analysis Period (min) 15

























m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 230: Wendell Dr.

 Ø2 (R)	 Ø4
71.8 s	28.2 s
 Ø6 (R)	 Ø8
71.8 s	28.2 s













Synchro Report - Signalized Intersections
240: MLK Jr. Dr.

Existing 2021 - PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	130	479	490	251	612	55	513	514	161	80	1058	229
Future Volume (vph)	130	479	490	251	612	55	513	514	161	80	1058	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	250		400	350		0	300		0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3242	3505	1553	3335	3539	1429	3303	3223	1509	3400	3312	1482
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3242	3505	1553	3335	3539	1429	3303	3223	1509	3400	3312	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			248			164			171			174
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1101			1180			1498			1729	
Travel Time (s)		25.0			26.8			34.0			39.3	
Peak Hour Factor	0.88	0.88	0.88	0.86	0.86	0.86	0.94	0.94	0.94	0.88	0.88	0.88
Heavy Vehicles (%)	8%	3%	4%	5%	2%	13%	6%	12%	7%	3%	9%	9%
Adj. Flow (vph)	148	544	557	292	712	64	546	547	171	91	1202	260
Shared Lane Traffic (%)												
Lane Group Flow (vph)	148	544	557	292	712	64	546	547	171	91	1202	260
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Synchro Report - Signalized Intersections
240: MLK Jr. Dr.

Existing 2021 - PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	10.1	25.2	25.2	13.4	28.5	28.5	20.7	50.3	50.3	11.1	40.7	40.7
Total Split (%)	10.1%	25.2%	25.2%	13.4%	28.5%	28.5%	20.7%	50.3%	50.3%	11.1%	40.7%	40.7%
Maximum Green (s)	5.6	20.7	20.7	8.9	24.0	24.0	16.2	45.8	45.8	6.6	36.2	36.2
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	5.6	20.7	20.7	8.9	24.0	24.0	16.2	48.0	48.0	6.5	36.2	36.2
Actuated g/C Ratio	0.06	0.21	0.21	0.09	0.24	0.24	0.16	0.48	0.48	0.06	0.36	0.36
v/c Ratio	0.82	0.75	1.08	0.99	0.84	0.14	1.02	0.35	0.21	0.41	1.00	0.40
Control Delay	80.0	44.6	84.0	95.9	46.5	0.6	76.4	12.1	4.0	67.6	46.0	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.0	44.6	84.0	95.9	46.5	0.6	76.4	12.1	4.0	67.6	46.0	3.7
LOS	E	D	F	F	D	A	E	B	A	E	D	A
Approach Delay		66.4			57.2			38.8			40.2	
Approach LOS		E			E			D			D	
90th %ile Green (s)	5.6	20.7	20.7	8.9	24.0	24.0	16.2	45.8	45.8	6.6	36.2	36.2
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	5.6	20.7	20.7	8.9	24.0	24.0	16.2	45.8	45.8	6.6	36.2	36.2
70th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	5.6	20.7	20.7	8.9	24.0	24.0	16.2	45.8	45.8	6.6	36.2	36.2
50th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
30th %ile Green (s)	5.6	20.7	20.7	8.9	24.0	24.0	16.2	45.8	45.8	6.6	36.2	36.2
30th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
10th %ile Green (s)	5.6	20.7	20.7	8.9	24.0	24.0	16.2	56.9	56.9	0.0	36.2	36.2
10th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	48	172	~262	97	227	0	~193	135	29	31	~404	12
Queue Length 95th (ft)	#100	226	#450	#170	281	0	#297	154	m55	m47	#535	m16
Internal Link Dist (ft)		1021			1100			1418			1649	
Turn Bay Length (ft)				250		400	350			300		
Base Capacity (vph)	181	725	518	296	849	467	535	1547	813	224	1198	647
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.75	1.08	0.99	0.84	0.14	1.02	0.35	0.21	0.41	1.00	0.40

Intersection Summary

Synchro Report - Signalized Intersections

240: MLK Jr. Dr.

Existing 2021 - PM
06/27/2021

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 84 (84%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay: 49.8

Intersection LOS: D

Intersection Capacity Utilization 80.0%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.











Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.























m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 240: MLK Jr. Dr.

 Ø1	 Ø2 (R) 	 Ø3	 Ø4
11.1 s	50.3 s	13.4 s	25.2 s
 Ø5	 Ø6 (R) 	 Ø7	 Ø8
20.7 s	40.7 s	10.1 s	28.5 s

Synchro Report - Signalized Intersections
250: Old Gordon Rd.













Existing 2021 - PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	4	10	4	47	50	40	38	691	20	30	1089	20
Future Volume (vph)	4	10	4	47	50	40	38	691	20	30	1089	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	150		250
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.933				0.850			0.850
Flt Protected		0.987		0.950			0.950			0.950		
Satd. Flow (prot)	0	1839	1583	1770	1738	0	1612	3223	1442	1656	3312	1482
Flt Permitted		0.948		0.641			0.111			0.277		
Satd. Flow (perm)	0	1766	1583	1194	1738	0	188	3223	1442	483	3312	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115		41				115			115
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		617			886			1729			1350	
Travel Time (s)		14.0			20.1			39.3			30.7	
Peak Hour Factor	0.63	0.63	0.63	0.78	0.83	0.83	0.79	0.91	0.92	0.75	0.94	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	12%	12%	12%	9%	9%	9%
Adj. Flow (vph)	6	16	6	60	60	48	48	759	22	40	1159	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	22	6	60	108	0	48	759	22	40	1159	22
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		6		5	2		7	4		3	8	

Synchro Report - Signalized Intersections
250: Old Gordon Rd.

Existing 2021 - PM

06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	6		6	2			4		4	8		8
Detector Phase	6	6	6	5	2		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	25.0	25.0	25.0	10.0	35.0		11.0	55.0	55.0	10.0	54.0	54.0
Total Split (%)	25.0%	25.0%	25.0%	10.0%	35.0%		11.0%	55.0%	55.0%	10.0%	54.0%	54.0%
Maximum Green (s)	20.5	20.5	20.5	5.5	30.5		6.5	50.5	50.5	5.5	49.5	49.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0			0	0		0	0
Act Effect Green (s)		31.1	31.1	40.0	40.0		48.9	45.0	45.0	47.7	44.4	44.4
Actuated g/C Ratio		0.31	0.31	0.40	0.40		0.49	0.45	0.45	0.48	0.44	0.44
v/c Ratio		0.04	0.01	0.12	0.15		0.27	0.52	0.03	0.14	0.79	0.03
Control Delay		31.6	0.0	23.7	15.8		8.0	17.7	1.4	10.6	27.9	0.1
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		31.6	0.0	23.7	15.8		8.0	17.7	1.4	10.6	27.9	0.1
LOS		C	A	C	B		A	B	A	B	C	A
Approach Delay		24.8			18.6			16.7			26.8	
Approach LOS		C			B			B			C	
90th %ile Green (s)	20.5	20.5	20.5	5.5	30.5		6.5	50.5	50.5	5.5	49.5	49.5
90th %ile Term Code	Coord	Coord	Coord	Max	Coord		Max	Hold	Hold	Max	Max	Max
70th %ile Green (s)	20.5	20.5	20.5	6.7	31.7		6.5	49.3	49.3	5.5	48.3	48.3
70th %ile Term Code	Coord	Coord	Coord	Max	Coord		Max	Hold	Hold	Max	Gap	Gap
50th %ile Green (s)	22.1	22.1	22.1	7.8	34.4		6.5	46.6	46.6	5.5	45.6	45.6
50th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Max	Hold	Hold	Max	Gap	Gap
30th %ile Green (s)	38.2	38.2	38.2	6.5	49.2		0.0	41.8	41.8	0.0	41.8	41.8
30th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Skip	Hold	Hold	Skip	Gap	Gap
10th %ile Green (s)	54.3	54.3	54.3	0.0	54.3		0.0	36.7	36.7	0.0	36.7	36.7
10th %ile Term Code	Coord	Coord	Coord	Skip	Coord		Skip	Hold	Hold	Skip	Gap	Gap
Queue Length 50th (ft)		11	0	26	29		10	183	0	11	315	0
Queue Length 95th (ft)		22	0	50	64		m15	232	m5	19	369	0
Internal Link Dist (ft)		537			806			1649			1270	
Turn Bay Length (ft)							150			150		250
Base Capacity (vph)		549	571	514	719		184	1627	785	294	1639	791
Starvation Cap Reductn		0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio		0.04	0.01	0.12	0.15		0.26	0.47	0.03	0.14	0.71	0.03

Intersection Summary

Synchro Report - Signalized Intersections

250: Old Gordon Rd.

Existing 2021 - PM

06/27/2021

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:NWTL and 6:SETL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 22.4

Intersection LOS: C

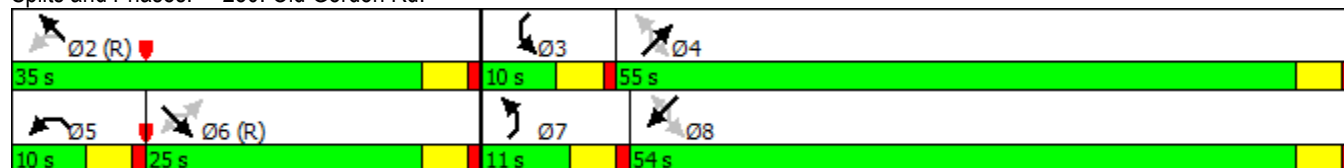
Intersection Capacity Utilization 50.6%

ICU Level of Service A

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.







Splits and Phases: 250: Old Gordon Rd.



Synchro Report - Signalized Intersections
270: Fulton Ind. Blvd & UPS Drive

Existing 2021 - PM
06/27/2021



Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	149	149	100	635	990	0
Future Volume (vph)	149	149	100	635	990	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Fr t	0.850					
Flt Protected	0.950	0.950				
Satd. Flow (prot)	1770	1583	1770	3539	3539	1863
Flt Permitted	0.950	0.160				
Satd. Flow (perm)	1770	1583	298	3539	3539	1863
Right Turn on Red	Yes					Yes
Satd. Flow (RTOR)	162					
Link Speed (mph)	30				30	
Link Distance (ft)	912				1889	1254
Travel Time (s)	20.7				42.9	28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	162	162	109	690	1076	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	162	162	109	690	1076	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12					
Link Offset(ft)	0					
Crosswalk Width(ft)	16					
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9		
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4	5		2	6	
Permitted Phases	4		2	6		
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0

Synchro Report - Signalized Intersections
270: Fulton Ind. Blvd & UPS Drive

Existing 2021 - PM
06/27/2021



Lane Group	SEL	SER	NEL	NET	SWT	SWR
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	9.5	37.5	28.0	28.0
Total Split (%)	37.5%	37.5%	15.8%	62.5%	46.7%	46.7%
Maximum Green (s)	18.0	18.0	5.0	33.0	23.5	23.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effect Green (s)	10.3	10.3	35.8	35.8	27.9	
Actuated g/C Ratio	0.19	0.19	0.65	0.65	0.51	
v/c Ratio	0.49	0.38	0.33	0.30	0.60	
Control Delay	24.3	6.5	7.2	5.0	12.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	24.3	6.5	7.2	5.0	12.8	
LOS	C	A	A	A	B	
Approach Delay	15.4			5.3	12.8	
Approach LOS	B			A	B	
90th %ile Green (s)	14.1	14.1	5.0	33.0	23.5	23.5
90th %ile Term Code	Gap	Gap	Max	MaxR	MaxR	MaxR
70th %ile Green (s)	11.6	11.6	5.0	33.0	23.5	23.5
70th %ile Term Code	Gap	Gap	Max	MaxR	MaxR	MaxR
50th %ile Green (s)	9.9	9.9	5.0	33.0	23.5	23.5
50th %ile Term Code	Gap	Gap	Max	MaxR	MaxR	MaxR
30th %ile Green (s)	8.4	8.4	5.0	33.0	23.5	23.5
30th %ile Term Code	Gap	Gap	Max	MaxR	MaxR	MaxR
10th %ile Green (s)	6.7	6.7	0.0	48.0	48.0	48.0
10th %ile Term Code	Gap	Gap	Skip	Dwell	Dwell	Dwell
Queue Length 50th (ft)	45	0	10	40	126	
Queue Length 95th (ft)	89	37	30	78	214	
Internal Link Dist (ft)	832			1809	1174	
Turn Bay Length (ft)						
Base Capacity (vph)	581	628	328	2298	1790	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.28	0.26	0.33	0.30	0.60	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 55.1

Natural Cycle: 60

Synchro Report - Signalized Intersections

270: Fulton Ind. Blvd & UPS Drive

Existing 2021 - PM

06/27/2021

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 10.5

Intersection LOS: B

Intersection Capacity Utilization 52.4%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 56.1

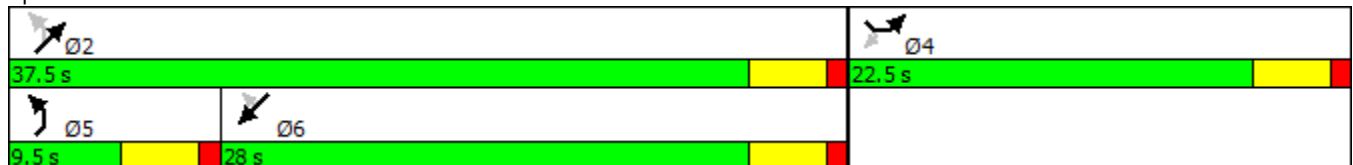
70th %ile Actuated Cycle: 53.6

50th %ile Actuated Cycle: 51.9

30th %ile Actuated Cycle: 50.4













10th %ile Actuated Cycle: 63.7

Splits and Phases: 270: Fulton Ind. Blvd & UPS Drive



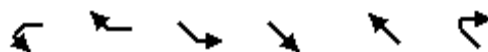
Synchro Report - Signalized Intersections
280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy

Existing 2021 - PM
06/27/2021

						
Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	85	0	28	651	1417	0
Future Volume (vph)	85	0	28	651	1417	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	300			0
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt						
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1570	1652	1570	3139	3139	1652
Flt Permitted	0.950		0.110			
Satd. Flow (perm)	1570	1652	182	3139	3139	1652
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	1300			1130	416	
Travel Time (s)	29.5			25.7	9.5	
Peak Hour Factor	0.82	0.92	0.64	0.91	0.94	0.92
Heavy Vehicles (%)	15%	15%	15%	15%	15%	15%
Adj. Flow (vph)	104	0	44	715	1507	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	104	0	44	715	1507	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	8		1	6	2	

Synchro Report - Signalized Intersections
280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy

Existing 2021 - PM
06/27/2021



Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Permitted Phases		8	6			2
Detector Phase	8	8	1	6	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	9.5	57.5	48.0	48.0
Total Split (%)	28.1%	28.1%	11.9%	71.9%	60.0%	60.0%
Maximum Green (s)	18.0	18.0	5.0	53.0	43.5	43.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effect Green (s)	10.6		62.6	63.5	56.9	
Actuated g/C Ratio	0.13		0.78	0.79	0.71	
v/c Ratio	0.50		0.18	0.29	0.68	
Control Delay	39.8		4.7	3.6	4.5	
Queue Delay	0.0		0.0	0.0	0.3	
Total Delay	39.8		4.7	3.6	4.7	
LOS	D		A	A	A	
Approach Delay	39.8			3.6	4.7	
Approach LOS	D			A	A	
90th %ile Green (s)	14.9	14.9	7.1	56.1	44.5	44.5
90th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
70th %ile Green (s)	12.4	12.4	6.4	58.6	47.7	47.7
70th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
50th %ile Green (s)	10.6	10.6	6.0	60.4	49.9	49.9
50th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
30th %ile Green (s)	8.8	8.8	0.0	62.2	62.2	62.2
30th %ile Term Code	Gap	Gap	Skip	Coord	Coord	Coord
10th %ile Green (s)	0.0	0.0	0.0	75.5	75.5	75.5
10th %ile Term Code	Skip	Skip	Skip	Coord	Coord	Coord
Queue Length 50th (ft)	49		4	46	46	
Queue Length 95th (ft)	82		10	83	66	
Internal Link Dist (ft)	1220			1050	336	
Turn Bay Length (ft)			300			
Base Capacity (vph)	353		248	2490	2231	
Starvation Cap Reductn	0		0	0	198	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.29		0.18	0.29	0.74	

Intersection Summary

Synchro Report - Signalized Intersections
 280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy

Existing 2021 - PM
 06/27/2021

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 72 (90%), Referenced to phase 2:NWT and 6:SETL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 5.9

Intersection LOS: A

Intersection Capacity Utilization 51.4%

ICU Level of Service A

Analysis Period (min) 15






















Splits and Phases: 280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy



Synchro Report - Signalized Intersections
290: Fulton Ind. Blvd & Donald Lee Hollowell Pkwy

Existing 2021 - PM













06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	55	807	100	230	1328	0	55	148	0	16	203	127
Future Volume (vph)	55	807	100	230	1328	0	55	148	0	16	203	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	300		0	300		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850								0.941	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1570	3139	1404	1570	3139	0	1570	3139	0	1570	2954	0
Flt Permitted	0.129			0.174			0.335			0.629		
Satd. Flow (perm)	213	3139	1404	287	3139	0	553	3139	0	1039	2954	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			205								148	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		416			899			1051			1138	
Travel Time (s)		9.5			20.4			23.9			25.9	
Peak Hour Factor	0.98	0.93	0.92	0.82	0.95	0.92	0.92	0.76	0.92	0.67	0.88	0.86
Heavy Vehicles (%)	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
Adj. Flow (vph)	56	868	109	280	1398	0	60	195	0	24	231	148
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	868	109	280	1398	0	60	195	0	24	379	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	

Synchro Report - Signalized Intersections
290: Fulton Ind. Blvd & Donald Lee Hollowell Pkwy

Existing 2021 - PM

06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	6		6	2			4			8		
Detector Phase	1	6	6	5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	33.0	33.0	15.0	38.5		9.5	22.5		9.5	22.5	
Total Split (%)	11.9%	41.3%	41.3%	18.8%	48.1%		11.9%	28.1%		11.9%	28.1%	
Maximum Green (s)	5.0	28.5	28.5	10.5	34.0		5.0	18.0		5.0	18.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)		11.0	11.0		11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effect Green (s)	40.0	33.8	33.8	51.4	44.8		17.8	15.8		16.0	12.0	
Actuated g/C Ratio	0.50	0.42	0.42	0.64	0.56		0.22	0.20		0.20	0.15	
v/c Ratio	0.27	0.65	0.15	0.71	0.80		0.32	0.32		0.10	0.67	
Control Delay	11.9	22.1	0.8	24.0	26.2		25.5	28.4		20.9	24.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.9	22.1	0.8	24.0	26.2		25.5	28.4		20.9	24.7	
LOS	B	C	A	C	C		C	C		C	C	
Approach Delay		19.3			25.8			27.7			24.5	
Approach LOS		B			C			C			C	
90th %ile Green (s)	5.7	28.5	28.5	11.2	34.0		5.0	17.3		5.0	17.3	
90th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Max	Gap	
70th %ile Green (s)	7.2	28.5	28.5	14.8	36.1		5.0	13.7		5.0	13.7	
70th %ile Term Code	Gap	Coord	Coord	Max	Coord		Max	Hold		Max	Gap	
50th %ile Green (s)	6.6	29.5	29.5	15.7	38.6		5.0	21.3		0.0	11.8	
50th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Max	Hold		Skip	Gap	
30th %ile Green (s)	0.0	33.6	33.6	13.5	51.6		5.0	19.4		0.0	9.9	
30th %ile Term Code	Skip	Coord	Coord	Gap	Coord		Max	Hold		Skip	Gap	
10th %ile Green (s)	0.0	49.1	49.1	10.1	63.7		0.0	7.3		0.0	7.3	
10th %ile Term Code	Skip	Coord	Coord	Gap	Coord		Skip	Gap		Skip	Hold	
Queue Length 50th (ft)	9	203	0	98	295		23	40		9	56	
Queue Length 95th (ft)	23	278	0	m#179	#554		47	60		18	90	
Internal Link Dist (ft)		336			819			971			1058	
Turn Bay Length (ft)	200		200	300			300			200		
Base Capacity (vph)	211	1327	712	395	1757		186	743		240	779	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.27	0.65	0.15	0.71	0.80		0.32	0.26		0.10	0.49	

Intersection Summary

Synchro Report - Signalized Intersections
 290: Fulton Ind. Blvd & Donald Lee Hollowell Pkwy

Existing 2021 - PM
 06/27/2021

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 73 (91%), Referenced to phase 2:NWTL and 6:SETL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 23.8

Intersection LOS: C

Intersection Capacity Utilization 69.7%

ICU Level of Service C









Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



















Splits and Phases: 290: Fulton Ind. Blvd & Donald Lee Hollowell Pkwy

 Ø1	 Ø2 (R)	 Ø3	 Ø4
9.5 s	38.5 s	9.5 s	22.5 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
15 s	33 s	9.5 s	22.5 s

Synchro Report - Signalized Intersections
300: Bolton Rd & Donald Lee Hollowell Pkwy

Existing 2021 - PM













06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	6	931	45	118	1395	42	32	49	63	46	73	49
Future Volume (vph)	6	931	45	118	1395	42	32	49	63	46	73	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993			0.996			0.941			0.960	
Flt Protected	0.950			0.950				0.989			0.987	
Satd. Flow (prot)	1805	3301	0	1787	3189	0	0	1734	0	0	1760	0
Flt Permitted	0.088			0.179				0.854			0.830	
Satd. Flow (perm)	167	3301	0	337	3189	0	0	1497	0	0	1480	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			6			45			24	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		899			304			783			722	
Travel Time (s)		20.4			6.9			17.8			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.78	0.78	0.78	0.95	0.95	0.95	0.88	0.88	0.88
Heavy Vehicles (%)	0%	9%	0%	1%	13%	5%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	7	1034	50	151	1788	54	34	52	66	52	83	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	1084	0	151	1842	0	0	152	0	0	191	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			8	

Synchro Report - Signalized Intersections
300: Bolton Rd & Donald Lee Hollowell Pkwy

Existing 2021 - PM

06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	9.6	43.0		14.4	47.8		22.6	22.6		22.6	22.6	
Total Split (%)	12.0%	53.8%		18.0%	59.8%		28.3%	28.3%		28.3%	28.3%	
Maximum Green (s)	5.1	38.5		9.9	43.3		18.1	18.1		18.1	18.1	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	50.8	45.4		57.6	55.7			13.4			13.4	
Actuated g/C Ratio	0.64	0.57		0.72	0.70			0.17			0.17	
v/c Ratio	0.03	0.58		0.40	0.83			0.53			0.71	
Control Delay	1.5	3.3		5.9	10.0			27.0			41.8	
Queue Delay	0.0	0.0		0.0	0.6			0.0			0.0	
Total Delay	1.5	3.3		5.9	10.6			27.0			41.8	
LOS	A	A		A	B			C			D	
Approach Delay		3.3			10.3			27.0			41.8	
Approach LOS		A			B			C			D	
90th %ile Green (s)	5.1	38.5		9.9	43.3		18.1	18.1		18.1	18.1	
90th %ile Term Code	Max	Coord		Max	Coord		Hold	Hold		Max	Max	
70th %ile Green (s)	0.0	41.8		8.5	54.8		16.2	16.2		16.2	16.2	
70th %ile Term Code	Skip	Coord		Gap	Coord		Hold	Hold		Gap	Gap	
50th %ile Green (s)	0.0	45.3		7.5	57.3		13.7	13.7		13.7	13.7	
50th %ile Term Code	Skip	Coord		Gap	Coord		Hold	Hold		Gap	Gap	
30th %ile Green (s)	0.0	48.4		6.8	59.7		11.3	11.3		11.3	11.3	
30th %ile Term Code	Skip	Coord		Gap	Coord		Hold	Hold		Gap	Gap	
10th %ile Green (s)	0.0	52.8		5.9	63.2		7.8	7.8		7.8	7.8	
10th %ile Term Code	Skip	Coord		Gap	Coord		Hold	Hold		Gap	Gap	
Queue Length 50th (ft)	0	28		7	79			48			79	
Queue Length 95th (ft)	m1	41		m18	#512			98			135	
Internal Link Dist (ft)		819			224			703			642	
Turn Bay Length (ft)	400			150								
Base Capacity (vph)	217	1875		421	2220			373			353	
Starvation Cap Reductn	0	0		0	119			0			0	
Spillback Cap Reductn	0	30		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.03	0.59		0.36	0.88			0.41			0.54	
Intersection Summary												

Synchro Report - Signalized Intersections
 300: Bolton Rd & Donald Lee Hollowell Pkwy

Existing 2021 - PM
 06/27/2021

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 5 (6%), Referenced to phase 2:NWTL and 6:SETL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 10.6

Intersection LOS: B

Intersection Capacity Utilization 68.9%

ICU Level of Service C







Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

















Splits and Phases: 300: Bolton Rd & Donald Lee Hollowell Pkwy

 Ø1	 Ø2 (R)	 Ø4
9.6 s	47.8 s	22.6 s
 Ø5	 Ø6 (R)	 Ø8
14.4 s	43 s	22.6 s

Synchro Report - Signalized Intersections
310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp

Existing 2021 - PM












06/27/2021

											
Lane Group	NBL	NBR	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR
Lane Configurations											
Traffic Volume (vph)	0	0	0	643	389	160	1141	0	128	0	429
Future Volume (vph)	0	0	0	643	389	160	1141	0	128	0	429
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00
Fr't				0.944							0.850
Flt Protected						0.950			0.950		
Satd. Flow (prot)	0	0	0	3152	0	1467	3343	0	2694	0	1335
Flt Permitted						0.109			0.950		
Satd. Flow (perm)	0	0	0	3152	0	168	3343	0	2694	0	1335
Right Turn on Red					Yes			Yes			Yes
Satd. Flow (RTOR)				182							82
Link Speed (mph)	30			30			30			30	
Link Distance (ft)	922			304			568			593	
Travel Time (s)	21.0			6.9			12.9			13.5	
Peak Hour Factor	0.92	0.92	0.95	0.95	0.95	0.96	0.96	0.96	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	10%	5%	23%	8%	2%	30%	2%	21%
Adj. Flow (vph)	0	0	0	677	409	167	1189	0	135	0	452
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	0	1086	0	167	1189	0	135	0	452
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			24			24			24	
Link Offset(ft)	0			0			0			0	
Crosswalk Width(ft)	16			16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15		9	15		9	15	15	9
Number of Detectors				2		1	2		1		1
Detector Template				Thru		Left	Thru		Left		Right
Leading Detector (ft)				100		20	100		20		20
Trailing Detector (ft)				0		0	0		0		0
Detector 1 Position(ft)				0		0	0		0		0
Detector 1 Size(ft)				6		20	6		20		20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)				0.0		0.0	0.0		0.0		0.0
Detector 1 Queue (s)				0.0		0.0	0.0		0.0		0.0
Detector 1 Delay (s)				0.0		0.0	0.0		0.0		0.0
Detector 2 Position(ft)				94			94				
Detector 2 Size(ft)				6			6				
Detector 2 Type				Cl+Ex			Cl+Ex				
Detector 2 Channel											
Detector 2 Extend (s)				0.0			0.0				
Turn Type				NA		pm+pt	NA		Prot		Perm
Protected Phases				6		5	2		3		
Permitted Phases						2					8
Detector Phase				6		5	2		3		8
Switch Phase											

Synchro Report - Signalized Intersections
310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp

Existing 2021 - PM

06/27/2021

											
Lane Group	NBL	NBR	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR
Minimum Initial (s)				5.0		5.0	5.0		5.0		5.0
Minimum Split (s)				22.5		9.5	22.5		9.5		22.5
Total Split (s)				35.0		13.0	48.0		32.0		32.0
Total Split (%)				43.8%		16.3%	60.0%		40.0%		40.0%
Maximum Green (s)				30.5		8.5	43.5		27.5		27.5
Yellow Time (s)				3.5		3.5	3.5		3.5		3.5
All-Red Time (s)				1.0		1.0	1.0		1.0		1.0
Lost Time Adjust (s)				0.0		0.0	0.0		0.0		0.0
Total Lost Time (s)				4.5		4.5	4.5		4.5		4.5
Lead/Lag				Lag		Lead					
Lead-Lag Optimize?				Yes		Yes					
Vehicle Extension (s)				3.0		3.0	3.0		3.0		3.0
Recall Mode				C-Min		None	C-Min		None		None
Walk Time (s)				7.0			7.0				7.0
Flash Dont Walk (s)				11.0			11.0				11.0
Pedestrian Calls (#/hr)				0			0				0
Act Effect Green (s)				32.2		45.2	45.2		25.8		25.8
Actuated g/C Ratio				0.40		0.56	0.56		0.32		0.32
v/c Ratio				0.79		0.72	0.63		0.16		0.93
Control Delay				8.8		31.2	8.8		19.1		49.5
Queue Delay				0.5		0.0	0.1		0.0		1.3
Total Delay				9.3		31.2	8.9		19.1		50.9
LOS				A		C	A		B		D
Approach Delay				9.3			11.7			43.6	
Approach LOS				A			B			D	
90th %ile Green (s)				30.5		8.5	43.5		27.5		27.5
90th %ile Term Code				Coord		Max	Coord		Hold		Max
70th %ile Green (s)				30.5		8.5	43.5		27.5		27.5
70th %ile Term Code				Coord		Max	Coord		Hold		Max
50th %ile Green (s)				30.5		8.5	43.5		27.5		27.5
50th %ile Term Code				Coord		Max	Coord		Hold		Max
30th %ile Green (s)				30.6		9.3	44.4		26.6		26.6
30th %ile Term Code				Coord		Gap	Coord		Hold		Gap
10th %ile Green (s)				39.1		7.3	50.9		20.1		20.1
10th %ile Term Code				Coord		Gap	Coord		Hold		Gap
Queue Length 50th (ft)				40		52	176		23		176
Queue Length 95th (ft)				72		m#99	216		43		#355
Internal Link Dist (ft)	842			224			488			513	
Turn Bay Length (ft)											
Base Capacity (vph)				1379		235	1886		926		512
Starvation Cap Reductn				66		0	0		0		0
Spillback Cap Reductn				0		0	117		0		11
Storage Cap Reductn				0		0	0		0		0
Reduced v/c Ratio				0.83		0.71	0.67		0.15		0.90

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Synchro Report - Signalized Intersections
 310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp

Existing 2021 - PM

06/27/2021

Offset: 16 (20%), Referenced to phase 2:NWTL and 6:SET, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 17.0

Intersection LOS: B

Intersection Capacity Utilization 65.6%

ICU Level of Service C

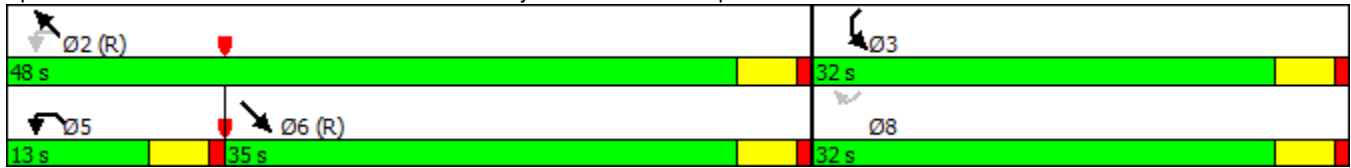
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

















Splits and Phases: 310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp



Synchro Report - Signalized Intersections
320: I-285 NB off-ramp & Donald Lee Hollowell Pkwy

Existing 2021 - PM












06/27/2021

											
Lane Group	SBL	SBR	SEL	SET	SER	NWL	NWT	NWR	NEL2	NEL	NER
Lane Configurations											
Traffic Volume (vph)	0	0	332	427	0	0	702	142	576	0	246
Future Volume (vph)	0	0	332	427	0	0	702	142	576	0	246
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	300		0	0		0		0	0
Storage Lanes	0	0	1		0	0		0		2	1
Taper Length (ft)	25		25			25				25	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt							0.975				0.850
Flt Protected			0.950						0.950		
Satd. Flow (prot)	0	0	1504	3167	0	0	4542	0	3213	0	1262
Flt Permitted			0.192						0.950		
Satd. Flow (perm)	0	0	304	3167	0	0	4542	0	3213	0	1262
Right Turn on Red					Yes			Yes			Yes
Satd. Flow (RTOR)							53				415
Link Speed (mph)	30			30			30			30	
Link Distance (ft)	782			568			1114			887	
Travel Time (s)	17.8			12.9			25.3			20.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	20%	14%	2%	2%	10%	18%	9%	2%	28%
Adj. Flow (vph)	0	0	361	464	0	0	763	154	670	0	286
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	361	464	0	0	917	0	670	0	286
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			12			12			24	
Link Offset(ft)	0			0			0			0	
Crosswalk Width(ft)	16			16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15		9	15		9	15	15	9
Number of Detectors			1	2			2		1		1
Detector Template			Left	Thru			Thru		Left		Right
Leading Detector (ft)			20	100			100		20		20
Trailing Detector (ft)			0	0			0		0		0
Detector 1 Position(ft)			0	0			0		0		0
Detector 1 Size(ft)			20	6			6		20		20
Detector 1 Type			Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex		Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)			0.0	0.0			0.0		0.0		0.0
Detector 1 Queue (s)			0.0	0.0			0.0		0.0		0.0
Detector 1 Delay (s)			0.0	0.0			0.0		0.0		0.0
Detector 2 Position(ft)				94			94				
Detector 2 Size(ft)				6			6				
Detector 2 Type				Cl+Ex			Cl+Ex				
Detector 2 Channel											
Detector 2 Extend (s)				0.0			0.0				
Turn Type			pm+pt	NA			NA		Prot		Perm
Protected Phases			5	2			6		3		

Synchro Report - Signalized Intersections
320: I-285 NB off-ramp & Donald Lee Hollowell Pkwy

Existing 2021 - PM

06/27/2021

											
Lane Group	SBL	SBR	SEL	SET	SER	NWL	NWT	NWR	NEL2	NEL	NER
Permitted Phases			2								3
Detector Phase			5	2			6		3		3
Switch Phase											
Minimum Initial (s)			5.0	5.0			5.0		5.0		5.0
Minimum Split (s)			9.5	22.5			22.5		9.5		9.5
Total Split (s)			27.0	54.0			27.0		26.0		26.0
Total Split (%)			33.8%	67.5%			33.8%		32.5%		32.5%
Maximum Green (s)			22.5	49.5			22.5		21.5		21.5
Yellow Time (s)			3.5	3.5			3.5		3.5		3.5
All-Red Time (s)			1.0	1.0			1.0		1.0		1.0
Lost Time Adjust (s)			0.0	0.0			0.0		0.0		0.0
Total Lost Time (s)			4.5	4.5			4.5		4.5		4.5
Lead/Lag			Lead				Lag				
Lead-Lag Optimize?			Yes				Yes				
Vehicle Extension (s)			3.0	3.0			3.0		3.0		3.0
Recall Mode			Min	C-Min			C-Min		None		None
Walk Time (s)				7.0			7.0				
Flash Dont Walk (s)				11.0			11.0				
Pedestrian Calls (#/hr)				0			0				
Act Effect Green (s)			50.7	50.7			28.6		20.3		20.3
Actuated g/C Ratio			0.63	0.63			0.36		0.25		0.25
v/c Ratio			0.79	0.23			0.55		0.82		0.45
Control Delay			15.8	1.9			22.3		37.6		2.6
Queue Delay			0.0	0.0			0.0		0.0		0.0
Total Delay			15.8	1.9			22.3		37.6		2.6
LOS			B	A			C		D		A
Approach Delay				8.0			22.3			27.2	
Approach LOS				A			C			C	
90th %ile Green (s)			22.5	49.5			22.5		21.5		21.5
90th %ile Term Code			Max	Coord			Coord		Max		Max
70th %ile Green (s)			22.5	49.5			22.5		21.5		21.5
70th %ile Term Code			Max	Coord			Coord		Max		Max
50th %ile Green (s)			18.9	49.5			26.1		21.5		21.5
50th %ile Term Code			Gap	Coord			Coord		Max		Max
30th %ile Green (s)			14.6	50.6			31.5		20.4		20.4
30th %ile Term Code			Gap	Coord			Coord		Gap		Gap
10th %ile Green (s)			9.6	54.5			40.4		16.5		16.5
10th %ile Term Code			Gap	Coord			Coord		Gap		Gap
Queue Length 50th (ft)			15	9			130		159		0
Queue Length 95th (ft)			m50	m11			186		207		0
Internal Link Dist (ft)	702			488			1034			807	
Turn Bay Length (ft)			300								
Base Capacity (vph)			530	2007			1657		863		642
Starvation Cap Reductn			0	0			0		0		0
Spillback Cap Reductn			0	0			0		0		0
Storage Cap Reductn			0	0			0		0		0
Reduced v/c Ratio			0.68	0.23			0.55		0.78		0.45
Intersection Summary											

Synchro Report - Signalized Intersections
 320: I-285 NB off-ramp & Donald Lee Hollowell Pkwy

Existing 2021 - PM
 06/27/2021

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 58 (73%), Referenced to phase 2:SETL and 6:NWT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 19.7

Intersection LOS: B

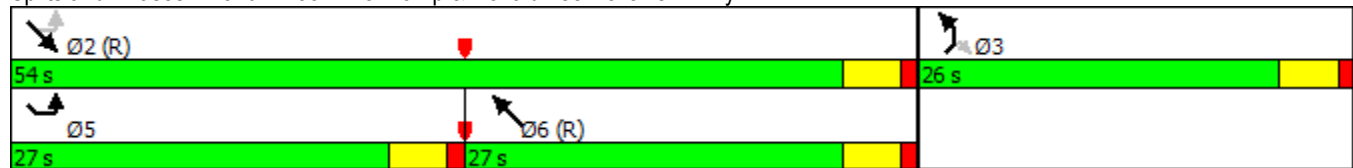
Intersection Capacity Utilization 65.6%

ICU Level of Service C

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.
























Splits and Phases: 320: I-285 NB off-ramp & Donald Lee Hollowell Pkwy



2031 AM Synchro Analysis Report













Synchro Report - Signalized Intersections
10: Cascade Palmetto Hwy/Fulton Ind. Blvd. & Campbellton Rd.

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	318	390	54	37	190	67	69	577	109	14	151	128
Future Volume (vph)	318	390	54	37	190	67	69	577	109	14	151	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	300		0	400		400	300		300
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.961				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1810	1482	1752	1682	0	1805	3438	1568	1327	2983	1468
Flt Permitted	0.289			0.476			0.520			0.241		
Satd. Flow (perm)	533	1810	1482	878	1682	0	988	3438	1568	337	2983	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			153		22				218			218
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		808			851			3037			3592	
Travel Time (s)		18.4			19.3			69.0			81.6	
Peak Hour Factor	0.95	0.95	0.95	0.96	0.96	0.96	0.82	0.82	0.82	0.86	0.86	0.86
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	3%	5%	9%	3%	7%	13%	0%	5%	3%	36%	21%	10%
Adj. Flow (vph)	388	476	66	45	230	81	98	816	154	19	204	173
Shared Lane Traffic (%)												
Lane Group Flow (vph)	388	476	66	45	311	0	98	816	154	19	204	173
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm

Synchro Report - Signalized Intersections
10: Cascade Palmetto Hwy/Fulton Ind. Blvd. & Campbellton Rd.

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	17.0	30.0	30.0	9.5	22.5		9.9	26.0	26.0	9.5	25.6	25.6
Total Split (%)	22.7%	40.0%	40.0%	12.7%	30.0%		13.2%	34.7%	34.7%	12.7%	34.1%	34.1%
Maximum Green (s)	12.5	25.5	25.5	5.0	18.0		5.4	21.5	21.5	5.0	21.1	21.1
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effect Green (s)	32.4	27.1	27.1	20.2	15.2		20.8	19.9	19.9	17.8	13.9	13.9
Actuated g/C Ratio	0.51	0.43	0.43	0.32	0.24		0.33	0.32	0.32	0.28	0.22	0.22
v/c Ratio	0.75	0.61	0.09	0.13	0.74		0.25	0.75	0.24	0.11	0.31	0.35
Control Delay	22.8	21.4	0.3	11.0	33.8		16.4	25.8	2.1	15.6	23.4	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	21.4	0.3	11.0	33.8		16.4	25.8	2.1	15.6	23.4	3.9
LOS	C	C	A	B	C		B	C	A	B	C	A
Approach Delay		20.5			30.9			21.5			14.5	
Approach LOS		C			C			C			B	
90th %ile Green (s)	12.5	25.5	25.5	5.0	18.0		5.4	21.5	21.5	5.0	21.1	21.1
90th %ile Term Code	Max	Max	Max	Max	Max		Max	Max	Max	Max	Hold	Hold
70th %ile Green (s)	12.5	25.5	25.5	5.0	18.0		5.4	21.6	21.6	0.0	11.7	11.7
70th %ile Term Code	Max	Max	Max	Max	Max		Max	Hold	Hold	Skip	Gap	Gap
50th %ile Green (s)	12.5	24.1	24.1	5.0	16.6		5.4	21.5	21.5	0.0	11.6	11.6
50th %ile Term Code	Max	Hold	Hold	Max	Gap		Max	Max	Max	Skip	Hold	Hold
30th %ile Green (s)	12.5	30.9	30.9	0.0	13.9		5.4	20.5	20.5	0.0	10.6	10.6
30th %ile Term Code	Max	Hold	Hold	Skip	Gap		Max	Gap	Gap	Skip	Hold	Hold
10th %ile Green (s)	12.5	27.0	27.0	0.0	10.0		0.0	14.6	14.6	0.0	14.6	14.6
10th %ile Term Code	Max	Hold	Hold	Skip	Gap		Skip	Gap	Gap	Skip	Hold	Hold
Queue Length 50th (ft)	85	153	0	8	101		26	143	0	5	37	0
Queue Length 95th (ft)	#240	#341	0	27	#240		51	223	8	16	62	21
Internal Link Dist (ft)		728			771			2957			3512	
Turn Bay Length (ft)	300		300	300			400		400	300		300
Base Capacity (vph)	519	786	730	352	503		397	1191	685	174	1013	642
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.61	0.09	0.13	0.62		0.25	0.69	0.22	0.11	0.20	0.27

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 63.1

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 21.4

Intersection LOS: C

Intersection Capacity Utilization 74.4%

ICU Level of Service D

Analysis Period (min) 15

90th %ile Actuated Cycle: 75

70th %ile Actuated Cycle: 65.6

50th %ile Actuated Cycle: 64.1









30th %ile Actuated Cycle: 60.4








10th %ile Actuated Cycle: 50.6

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 10: Cascade Palmetto Hwy/Fulton Ind. Blvd. & Campbellton Rd.








 Ø1	 Ø2	 Ø3	 Ø4
9.5 s	26 s	9.5 s	30 s
 Ø5	 Ø6	 Ø7	 Ø8
9.9 s	25.6 s	17 s	22.5 s

Intersection							
Int Delay, s/veh	4.6						
Movement	SEL	SER	NEL	NET	SWU	SWT	SWR
Lane Configurations							
Traffic Vol, veh/h	40	19	37	1125	4	412	48
Future Vol, veh/h	40	19	37	1125	4	412	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	-	Yield
Storage Length	0	100	150	-	150	-	150
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	57	57	96	96	86	86	86
Heavy Vehicles, %	33	37	24	4	0	14	15
Mvmt Flow	81	39	45	1359	5	556	65

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1336	278	556
Stage 1	567	-	-
Stage 2	769	-	-
Critical Hdwy	7.46	7.64	4.58
Critical Hdwy Stg 1	6.46	-	-
Critical Hdwy Stg 2	6.46	-	-
Follow-up Hdwy	3.83	3.67	2.44
Pot Cap-1 Maneuver	111	624	873
Stage 1	453	-	-
Stage 2	346	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	105	624	873
Mov Cap-2 Maneuver	105	-	-
Stage 1	453	-	-
Stage 2	328	-	-

Approach	SE	NE	SW
HCM Control Delay, s	77.6	0.3	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SELn2	SWU	SWT	SWR
Capacity (veh/h)	873	-	105	624	342	-	-
HCM Lane V/C Ratio	0.051	-	0.775	0.062	0.016	-	-
HCM Control Delay (s)	9.3	-	109.2	11.2	15.7	-	-
HCM Lane LOS	A	-	F	B	C	-	-
HCM 95th %tile Q(veh)	0.2	-	4.2	0.2	0	-	-

Intersection							
Int Delay, s/veh	100.1						
Movement	SEL	SER	NEL	NET	SWU	SWT	SWR
Lane Configurations							
Traffic Vol, veh/h	79	45	46	1449	3	451	92
Future Vol, veh/h	79	45	46	1449	3	451	92
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	-	Free
Storage Length	0	0	300	-	250	-	300
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	41	41	91	91	92	92	92
Heavy Vehicles, %	34	18	9	4	0	12	35
Mvmt Flow	224	127	59	1847	4	569	116

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1617	284	569
Stage 1	576	-	-
Stage 2	1041	-	-
Critical Hdwy	7.48	7.26	4.28
Critical Hdwy Stg 1	6.48	-	-
Critical Hdwy Stg 2	6.48	-	-
Follow-up Hdwy	3.84	3.48	2.29
Pot Cap-1 Maneuver	~ 68	667	953
Stage 1	445	-	-
Stage 2	238	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	~ 64	667	953
Mov Cap-2 Maneuver	~ 64	-	-
Stage 1	445	-	-
Stage 2	~ 223	-	-

Approach	SE	NE	SW
HCM Control Delay, s	804.9	0.3	0.2
HCM LOS	F		

Minor Lane/Major Mvmt	NEL	NET SELn1	SELn2	SWU	SWT
Capacity (veh/h)	953	-	64	667	202
HCM Lane V/C Ratio	0.062	-	3.492	0.191	0.019
HCM Control Delay (s)	9	\$	1256.8	11.7	23.2
HCM Lane LOS	A	-	F	B	C
HCM 95th %tile Q(veh)	0.2	-	23.5	0.7	0.1

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM2010 Report - Unsignalized Intersections
 30: Fulton Industrial Blvd. & Riverside Dr./Tradewater Pkwy

Future 2031 - AM
 06/27/2021

Intersection												
Int Delay, s/veh	71.8											
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↔	↔		↔		↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	38	16	33	39	22	54	74	820	24	22	464	61
Future Vol, veh/h	38	16	33	39	22	54	74	820	24	22	464	61
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	300	-	200	300	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	81	81	81	89	89	89	97	97	97
Heavy Vehicles, %	35	0	42	8	0	4	10	12	21	0	20	25
Mvmt Flow	57	24	49	56	32	77	96	1069	31	26	555	73

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1351	1870	277	1604	1870	534	555	0	0	1069	0	0
Stage 1	608	608	-	1262	1262	-	-	-	-	-	-	-
Stage 2	743	1262	-	342	608	-	-	-	-	-	-	-
Critical Hdwy	8.2	6.5	7.74	7.66	6.5	6.98	4.3	-	-	4.1	-	-
Critical Hdwy Stg 1	7.2	5.5	-	6.66	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.2	5.5	-	6.66	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.85	4	3.72	3.58	4	3.34	2.3	-	-	2.2	-	-
Pot Cap-1 Maneuver	81	73	613	66	73	485	958	-	-	660	-	-
Stage 1	377	489	-	171	243	-	-	-	-	-	-	-
Stage 2	307	243	-	630	489	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 37	63	613	~ 39	63	485	958	-	-	660	-	-
Mov Cap-2 Maneuver	~ 37	63	-	~ 39	63	-	-	-	-	-	-	-
Stage 1	339	470	-	154	219	-	-	-	-	-	-	-
Stage 2	199	219	-	529	470	-	-	-	-	-	-	-




















Approach	SE	NW	NE	SW
HCM Control Delay, s	399.3	\$ 614.5	0.7	0.4
HCM LOS	F	F		













Minor Lane/Major Mvmt	NEL	NET	NERNWLn1	SELn1	SELn2	SWL	SWT	SWR
Capacity (veh/h)	958	-	-	79	42	613	660	-
HCM Lane V/C Ratio	0.101	-	-	2.085	1.912	0.08	0.04	-
HCM Control Delay (s)	9.2	-	-	\$ 614.5	\$ 636.3	11.4	10.7	-
HCM Lane LOS	A	-	-	F	F	B	B	-
HCM 95th %tile Q(veh)	0.3	-	-	14.9	8.4	0.3	0.1	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Synchro Report - Signalized Intersections
50: Plummer Rd.





















Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		0	250		150
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Flt												
Flt Protected												
Satd. Flow (prot)	0	1863	0	0	1863	0	1863	3539	0	1863	3539	1863
Flt Permitted												
Satd. Flow (perm)	0	1863	0	0	1863	0	1863	3539	0	1863	3539	1863
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1019			888			1369			1113	
Travel Time (s)		23.2			20.2			31.1			25.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type							Perm			Perm		Perm
Protected Phases		4			8			2			6	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	22.5
Total Split (s)	38.5	38.5		38.5	38.5		36.5	36.5		36.5	36.5	36.5
Total Split (%)	51.3%	51.3%		51.3%	51.3%		48.7%	48.7%		48.7%	48.7%	48.7%
Maximum Green (s)	34.0	34.0		34.0	34.0		32.0	32.0		32.0	32.0	32.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	Max	Max		Max	Max		Min	Min		Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effect Green (s)												
Actuated g/C Ratio												
v/c Ratio												
Control Delay												
Queue Delay												
Total Delay												
LOS												
Approach Delay												
Approach LOS												
90th %ile Green (s)	34.0	34.0		34.0	34.0		32.0	32.0		32.0	32.0	32.0
90th %ile Term Code	MaxR	MaxR		MaxR	MaxR		Hold	Hold		MaxR	MaxR	MaxR
70th %ile Green (s)	34.0	34.0		34.0	34.0		32.0	32.0		32.0	32.0	32.0
70th %ile Term Code	MaxR	MaxR		MaxR	MaxR		Hold	Hold		MaxR	MaxR	MaxR
50th %ile Green (s)	34.0	34.0		34.0	34.0		32.0	32.0		32.0	32.0	32.0
50th %ile Term Code	MaxR	MaxR		MaxR	MaxR		Hold	Hold		MaxR	MaxR	MaxR
30th %ile Green (s)	34.0	34.0		34.0	34.0		32.0	32.0		32.0	32.0	32.0
30th %ile Term Code	MaxR	MaxR		MaxR	MaxR		Hold	Hold		MaxR	MaxR	MaxR
10th %ile Green (s)	34.0	34.0		34.0	34.0		32.0	32.0		32.0	32.0	32.0
10th %ile Term Code	MaxR	MaxR		MaxR	MaxR		Hold	Hold		MaxR	MaxR	MaxR
Queue Length 50th (ft)												
Queue Length 95th (ft)												
Internal Link Dist (ft)		939			808			1289			1033	
Turn Bay Length (ft)												
Base Capacity (vph)												
Starvation Cap Reductn												
Spillback Cap Reductn												
Storage Cap Reductn												
Reduced v/c Ratio												
Intersection Summary												


Synchro Report - Signalized Intersections
60: Fulton Ind. Blvd. & Boat Rock Blvd./Boat Rock Rd.

Future 2031 - AM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	71	50	50	36	50	100	676	50	126	798	100
Future Volume (vph)	100	71	50	50	36	50	100	676	50	126	798	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	300		150
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.938			0.950			0.990				0.850
Flt Protected	0.950				0.982		0.950			0.950		
Satd. Flow (prot)	1128	1114	0	0	1477	0	1128	2978	0	1504	3008	897
Flt Permitted	0.512				0.819		0.157			0.196		
Satd. Flow (perm)	608	1114	0	0	1232	0	186	2978	0	310	3008	897
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48			34			11				143
Link Speed (mph)		30			30			30				30
Link Distance (ft)		812			1105			708			889	
Travel Time (s)		18.5			25.1			16.1			20.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	60%	60%	60%	20%	20%	20%	60%	20%	20%	20%	20%	80%
Adj. Flow (vph)	126	90	63	63	45	63	126	852	63	159	1006	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	126	153	0	0	171	0	126	915	0	159	1006	126
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm

Synchro Report - Signalized Intersections
60: Fulton Ind. Blvd. & Boat Rock Blvd./Boat Rock Rd.

Future 2031 - AM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	22.5
Total Split (s)	9.6	32.1		22.5	22.5		11.0	36.8		11.1	36.9	36.9
Total Split (%)	12.0%	40.1%		28.1%	28.1%		13.8%	46.0%		13.9%	46.1%	46.1%
Maximum Green (s)	5.1	27.6		18.0	18.0		6.5	32.3		6.6	32.4	32.4
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Min		Min	Min		None	Min		None	Min	Min
Walk Time (s)		7.0		7.0	7.0			7.0			7.0	7.0
Flash Dont Walk (s)		11.0		11.0	11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)		0		0	0			0			0	0
Act Effct Green (s)	19.8	19.8			12.8		35.3	28.4		35.3	28.5	28.5
Actuated g/C Ratio	0.29	0.29			0.18		0.51	0.41		0.51	0.41	0.41
v/c Ratio	0.59	0.43			0.67		0.67	0.75		0.58	0.81	0.28
Control Delay	32.9	18.6			36.8		32.3	22.6		19.2	25.7	4.2
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	32.9	18.6			36.8		32.3	22.6		19.2	25.7	4.2
LOS	C	B			D		C	C		B	C	A
Approach Delay		25.1			36.8			23.7			22.8	
Approach LOS		C			D			C			C	
90th %ile Green (s)	5.1	27.6		18.0	18.0		6.5	32.3		6.6	32.4	32.4
90th %ile Term Code	Max	Hold		Max	Max		Max	Max		Max	Max	Max
70th %ile Green (s)	5.1	26.5		16.9	16.9		6.5	32.3		6.6	32.4	32.4
70th %ile Term Code	Max	Hold		Gap	Gap		Max	Max		Max	Max	Max
50th %ile Green (s)	5.1	23.2		13.6	13.6		6.5	32.3		6.6	32.4	32.4
50th %ile Term Code	Max	Hold		Gap	Gap		Max	Hold		Max	Max	Max
30th %ile Green (s)	5.1	20.2		10.6	10.6		6.5	28.0		6.6	28.1	28.1
30th %ile Term Code	Max	Hold		Gap	Gap		Max	Hold		Max	Gap	Gap
10th %ile Green (s)	0.0	6.4		6.4	6.4		6.5	17.6		6.3	17.4	17.4
10th %ile Term Code	Skip	Hold		Gap	Gap		Max	Hold		Gap	Gap	Gap
Queue Length 50th (ft)	46	37			60		26	177		32	205	0
Queue Length 95th (ft)	91	87			125		#110	272		#80	#313	26
Internal Link Dist (ft)		732			1025			628			809	
Turn Bay Length (ft)							300			300		150
Base Capacity (vph)	213	494			361		187	1465		277	1479	513
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.59	0.31			0.47		0.67	0.62		0.57	0.68	0.25

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 69.3

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 24.2

Intersection LOS: C

Intersection Capacity Utilization 63.8%

ICU Level of Service B

Analysis Period (min) 15

90th %ile Actuated Cycle: 80

70th %ile Actuated Cycle: 78.9

50th %ile Actuated Cycle: 75.6







30th %ile Actuated Cycle: 68.3

10th %ile Actuated Cycle: 43.8

95th percentile volume exceeds capacity, queue may be longer.
























Queue shown is maximum after two cycles.

Splits and Phases: 60: Fulton Ind. Blvd. & Boat Rock Blvd./Boat Rock Rd.

 Ø1	 Ø2	 Ø4
11.1 s	36.8 s	32.1 s
 Ø5	 Ø6	 Ø7
11 s	36.9 s	9.6 s
		 Ø8
		22.5 s













Synchro Report - Signalized Intersections
70: Lakeview Ct. & Fulton Ind. Blvd

Future 2031 - AM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	946	6	25	1020	31	2	0	18	41	0	2
Future Volume (vph)	16	946	6	25	1020	31	2	0	18	41	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	300		300	0		0	0		0
Storage Lanes	1		1	1		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.850	
Flt Protected	0.950			0.950				0.950		0.950		
Satd. Flow (prot)	1421	3167	1615	1556	3167	1091	0	1203	1380	1026	1077	0
Flt Permitted	0.097			0.200						0.588		
Satd. Flow (perm)	145	3167	1615	328	3167	1091	0	1267	1380	635	1077	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			127			127		208	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		849			1099			609			533	
Travel Time (s)		19.3			25.0			13.8			12.1	
Peak Hour Factor	0.93	0.93	0.93	0.72	0.72	0.72	0.83	0.83	0.83	0.84	0.84	0.84
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	27%	14%	0%	16%	14%	48%	50%	0%	17%	76%	2%	50%
Adj. Flow (vph)	20	1180	7	40	1643	50	3	0	25	57	0	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	1180	7	40	1643	50	0	3	25	57	3	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	

Synchro Report - Signalized Intersections
70: Lakeview Ct. & Fulton Ind. Blvd

Future 2031 - AM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	9.5	48.5	48.5	9.5	48.5	48.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (%)	10.6%	53.9%	53.9%	10.6%	53.9%	53.9%	10.6%	25.0%	25.0%	10.6%	25.0%	25.0%
Maximum Green (s)	5.0	44.0	44.0	5.0	44.0	44.0	5.0	18.0	18.0	5.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	54.7	54.9	54.9	54.7	54.9	54.9		5.9	5.9	9.1	9.3	
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.78	0.78		0.08	0.08	0.13	0.13	
v/c Ratio	0.10	0.48	0.01	0.12	0.66	0.06		0.03	0.11	0.52	0.01	
Control Delay	4.7	7.6	0.0	4.2	11.3	0.1		33.5	1.0	44.7	0.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	4.7	7.6	0.0	4.2	11.3	0.1		33.5	1.0	44.7	0.0	
LOS	A	A	A	A	B	A		C	A	D	A	
Approach Delay		7.5			10.8			4.4			42.5	
Approach LOS		A			B			A			D	
90th %ile Green (s)	5.0	44.0	44.0	5.0	44.0	44.0	0.0	6.8	6.8	5.0	16.3	
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Skip	Gap	Gap	Max	Hold	
70th %ile Green (s)	5.0	44.0	44.0	5.0	44.0	44.0	0.0	6.2	6.2	5.0	15.7	
70th %ile Term Code	Max	Hold	Hold	Max	Max	Max	Skip	Gap	Gap	Max	Hold	
50th %ile Green (s)	0.0	53.2	53.2	0.0	53.2	53.2	0.0	0.0	0.0	5.5	5.5	
50th %ile Term Code	Skip	Dwell	Dwell	Skip	Dwell	Dwell	Skip	Skip	Skip	Hold	Hold	
30th %ile Green (s)	0.0	59.0	59.0	0.0	59.0	59.0	0.0	0.0	0.0	0.0	0.0	
30th %ile Term Code	Skip	Dwell	Dwell	Skip	Dwell	Dwell	Skip	Skip	Skip	Skip	Skip	
10th %ile Green (s)	0.0	59.0	59.0	0.0	59.0	59.0	0.0	0.0	0.0	0.0	0.0	
10th %ile Term Code	Skip	Dwell	Dwell	Skip	Dwell	Dwell	Skip	Skip	Skip	Skip	Skip	
Queue Length 50th (ft)	1	58	0	2	106	0		1	0	24	0	
Queue Length 95th (ft)	9	266	0	11	303	0		8	0	52	0	
Internal Link Dist (ft)		769			1019			529			453	
Turn Bay Length (ft)	300		300	300		300						
Base Capacity (vph)	204	2474	1289	343	2474	880		327	450	110	432	
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Reduced v/c Ratio	0.10	0.48	0.01	0.12	0.66	0.06		0.01	0.06	0.52	0.01	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 70.3

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 10.1

Intersection LOS: B

Intersection Capacity Utilization 49.9%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 78.8

70th %ile Actuated Cycle: 78.2

50th %ile Actuated Cycle: 67.7

30th %ile Actuated Cycle: 63.5


10th %ile Actuated Cycle: 63.5

Splits and Phases: 70: Lakeview Ct. & Fulton Ind. Blvd















Synchro Report - Signalized Intersections
80: Fulton Ind. Blvd & Camp Creek Pkwy

Future 2031 - AM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑	↗
Traffic Volume (vph)	139	888	100	67	591	230	300	363	100	85	300	185
Future Volume (vph)	139	888	100	67	591	230	300	363	100	85	300	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	350		300	350		300	300		300
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	4550	1417	3072	3167	1417	2334	2407	1077	2334	2407	1077
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	4550	1417	3072	3167	1417	2334	2407	1077	2334	2407	1077
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			205			290			143			205
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1099			761			631			649	
Travel Time (s)		25.0			17.3			14.3			14.8	
Peak Hour Factor	0.83	0.88	0.88	0.70	0.94	0.92	0.94	0.94	0.94	0.91	0.91	0.91
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	14%	14%	14%	14%	14%	14%	50%	50%	50%	50%	50%	50%
Adj. Flow (vph)	194	1171	132	111	729	290	370	448	123	108	382	236
Shared Lane Traffic (%)												
Lane Group Flow (vph)	194	1171	132	111	729	290	370	448	123	108	382	236
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm

Synchro Report - Signalized Intersections
80: Fulton Ind. Blvd & Camp Creek Pkwy

Future 2031 - AM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	11.0	29.0	29.0	9.5	27.5	27.5	19.0	28.8	28.8	12.7	22.5	22.5
Total Split (%)	13.8%	36.3%	36.3%	11.9%	34.4%	34.4%	23.8%	36.0%	36.0%	15.9%	28.1%	28.1%
Maximum Green (s)	6.5	24.5	24.5	5.0	23.0	23.0	14.5	24.3	24.3	8.2	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	6.5	25.6	25.6	5.0	21.9	21.9	14.1	25.1	25.1	7.6	16.2	16.2
Actuated g/C Ratio	0.08	0.33	0.33	0.07	0.29	0.29	0.18	0.33	0.33	0.10	0.21	0.21
v/c Ratio	0.74	0.77	0.22	0.55	0.81	0.47	0.86	0.57	0.27	0.47	0.75	0.61
Control Delay	54.6	28.6	1.6	47.6	34.3	5.9	52.9	26.2	4.8	40.8	39.1	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.6	28.6	1.6	47.6	34.3	5.9	52.9	26.2	4.8	40.8	39.1	13.6
LOS	D	C	A	D	C	A	D	C	A	D	D	B
Approach Delay		29.6			28.3			33.9			31.1	
Approach LOS		C			C			C			C	
90th %ile Green (s)	6.5	24.5	24.5	5.0	23.0	23.0	14.5	24.3	24.3	8.2	18.0	18.0
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max
70th %ile Green (s)	6.5	24.5	24.5	5.0	23.0	23.0	14.5	24.3	24.3	8.2	18.0	18.0
70th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Hold	Hold	Max	Max	Max
50th %ile Green (s)	6.5	24.5	24.5	5.0	23.0	23.0	14.5	24.3	24.3	8.2	18.0	18.0
50th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Hold	Hold	Max	Max	Max
30th %ile Green (s)	6.5	24.5	24.5	5.0	23.0	23.0	14.5	23.0	23.0	7.7	16.2	16.2
30th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Hold	Hold	Gap	Gap	Gap
10th %ile Green (s)	6.5	28.6	28.6	0.0	17.6	17.6	12.6	28.4	28.4	0.0	11.3	11.3
10th %ile Term Code	Max	Hold	Hold	Skip	Gap	Gap	Gap	Hold	Hold	Skip	Gap	Gap
Queue Length 50th (ft)	50	198	0	28	176	0	93	100	0	26	93	12
Queue Length 95th (ft)	#89	245	8	41	#248	55	#170	150	29	51	142	81
Internal Link Dist (ft)		1019			681			551			569	
Turn Bay Length (ft)	300		300	350		300	350		300	300		300
Base Capacity (vph)	261	1515	608	201	953	629	443	795	451	250	567	410
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.77	0.22	0.55	0.76	0.46	0.84	0.56	0.27	0.43	0.67	0.58

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 76.8

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 30.5

Intersection LOS: C

Intersection Capacity Utilization 58.6%

ICU Level of Service B

Analysis Period (min) 15

90th %ile Actuated Cycle: 80

70th %ile Actuated Cycle: 80

50th %ile Actuated Cycle: 80









30th %ile Actuated Cycle: 78.2

10th %ile Actuated Cycle: 66

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 80: Fulton Ind. Blvd & Camp Creek Pkwy

























 Ø1	 Ø2	 Ø3	 Ø4
9.5 s	29 s	19 s	22.5 s
 Ø5	 Ø6	 Ø7	 Ø8
11 s	27.5 s	12.7 s	28.8 s

Synchro Report - Signalized Intersections

Future 2031 - AM

100: Fulton Ind. Blvd/Fulton Ind. Blvd. & Cascade Rd./Great SW Pkwy

08/06/2021













												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	38	16	106	184	25	94	242	1970	188	82	711	20
Future Volume (vph)	38	16	106	184	25	94	242	1970	188	82	711	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		300	300		300
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1597	1727	1262	1597	1900	1538	1612	3252	1553	1671	3085	1468
Flt Permitted	0.734			0.505			0.273			0.044		
Satd. Flow (perm)	1234	1727	1262	849	1900	1538	463	3252	1553	77	3085	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			141			109			142			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			669			1465			1699	
Travel Time (s)		10.4			15.2			33.3			38.6	
Peak Hour Factor	0.87	0.87	0.87	0.83	0.83	0.83	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	13%	10%	28%	13%	0%	5%	12%	11%	4%	8%	17%	10%
Adj. Flow (vph)	51	21	141	257	35	131	292	2380	227	99	859	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	21	141	257	35	131	292	2380	227	99	859	24
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm

Synchro Report - Signalized Intersections

Future 2031 - AM

100: Fulton Ind. Blvd/Fulton Ind. Blvd. & Cascade Rd./Great SW Pkwy

08/06/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	10.6	22.5	22.5	14.0	25.9	25.9	28.2	104.0	104.0	9.5	85.3	85.3
Total Split (%)	7.1%	15.0%	15.0%	9.3%	17.3%	17.3%	18.8%	69.3%	69.3%	6.3%	56.9%	56.9%
Maximum Green (s)	6.1	18.0	18.0	9.5	21.4	21.4	23.7	99.5	99.5	5.0	80.8	80.8
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	14.6	8.6	8.6	21.7	14.1	14.1	109.0	99.5	99.5	96.8	91.8	91.8
Actuated g/C Ratio	0.10	0.06	0.06	0.15	0.10	0.10	0.78	0.71	0.71	0.69	0.65	0.65
v/c Ratio	0.36	0.20	0.67	1.42	0.18	0.52	0.63	1.03	0.20	0.91	0.43	0.02
Control Delay	58.6	66.4	25.7	258.9	61.7	23.1	11.1	49.4	3.2	93.4	13.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.6	66.4	25.7	258.9	61.7	23.1	11.1	49.4	3.2	93.4	13.3	0.0
LOS	E	E	C	F	E	C	B	D	A	F	B	A
Approach Delay		37.6			169.5			42.0			21.1	
Approach LOS		D			F			D			C	
90th %ile Green (s)	6.1	15.1	15.1	9.5	18.5	18.5	18.0	99.5	99.5	5.0	86.5	86.5
90th %ile Term Code	Max	Gap	Gap	Max	Hold	Hold	Gap	Max	Max	Max	Hold	Hold
70th %ile Green (s)	6.1	9.3	9.3	9.5	12.7	12.7	14.0	99.5	99.5	5.0	90.5	90.5
70th %ile Term Code	Max	Gap	Gap	Max	Hold	Hold	Gap	Max	Max	Max	Hold	Hold
50th %ile Green (s)	6.1	7.1	7.1	9.5	10.5	10.5	12.1	99.5	99.5	5.0	92.4	92.4
50th %ile Term Code	Max	Gap	Gap	Max	Hold	Hold	Gap	Max	Max	Max	Hold	Hold
30th %ile Green (s)	6.1	6.2	6.2	9.5	9.6	9.6	10.8	99.5	99.5	5.0	93.7	93.7
30th %ile Term Code	Max	Gap	Gap	Max	Hold	Hold	Gap	Max	Max	Max	Hold	Hold
10th %ile Green (s)	0.0	5.5	5.5	9.5	19.5	19.5	9.1	99.5	99.5	5.0	95.4	95.4
10th %ile Term Code	Skip	Gap	Gap	Max	Hold	Hold	Gap	Max	Max	Max	Hold	Hold
Queue Length 50th (ft)	41	19	0	~259	30	19	60	~1202	21	41	177	0
Queue Length 95th (ft)	79	45	62	#430	61	70	114	#1464	56	#176	290	0
Internal Link Dist (ft)		378			589			1385			1619	
Turn Bay Length (ft)							300		300	300		300
Base Capacity (vph)	144	221	284	181	289	326	552	2302	1140	109	2014	996
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.10	0.50	1.42	0.12	0.40	0.53	1.03	0.20	0.91	0.43	0.02

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 140.6

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.42

Intersection Signal Delay: 49.2

Intersection LOS: D

Intersection Capacity Utilization 98.2%

ICU Level of Service F

Analysis Period (min) 15

90th %ile Actuated Cycle: 147.1

70th %ile Actuated Cycle: 141.3

50th %ile Actuated Cycle: 139.1

30th %ile Actuated Cycle: 138.2

10th %ile Actuated Cycle: 137.5









~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 100: Fulton Ind. Blvd/Fulton Ind. Blvd. & Cascade Rd./Great SW Pkwy

 Ø1	 Ø2	 Ø3	 Ø4
9.5 s	104 s	14 s	22.5 s
 Ø5	 Ø6	 Ø7	 Ø8
28.2 s	85.3 s	10.6 s	25.9 s

Intersection												
Int Delay, s/veh	32											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↕	↕	↔	↕	↔
Traffic Vol, veh/h	6	0	10	11	1	68	73	1301	49	121	816	39
Future Vol, veh/h	6	0	10	11	1	68	73	1301	49	121	816	39
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	0	300	-	300	250	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	88	88	88	97	97	97	80	80	80
Heavy Vehicles, %	17	0	60	18	0	29	4	12	10	9	16	28
Mvmt Flow	11	0	18	15	1	90	87	1556	59	175	1183	57

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2487	3264	592	2673	3264	778	1183	0	-	1556	0	0
Stage 1	1534	1534	-	1730	1730	-	-	-	-	-	-	-
Stage 2	953	1730	-	943	1534	-	-	-	-	-	-	-
Critical Hdwy	7.84	6.5	8.1	7.86	6.5	7.48	4.18	-	-	4.28	-	-
Critical Hdwy Stg 1	6.84	5.5	-	6.86	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.84	5.5	-	6.86	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4	3.9	3.68	4	3.59	2.24	-	-	2.29	-	-
Pot Cap-1 Maneuver	12	9	330	~ 8	9	286	575	-	0	389	-	-
Stage 1	105	180	-	77	144	-	-	-	0	-	-	-
Stage 2	251	144	-	253	180	-	-	-	0	-	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	~ 4	4	330	~ 4	4	286	575	-	-	389	-	-
Mov Cap-2 Maneuver	~ 4	4	-	~ 4	4	-	-	-	-	-	-	-
Stage 1	89	99	-	65	122	-	-	-	-	-	-	-
Stage 2	145	122	-	131	99	-	-	-	-	-	-	-





















Approach	EB	WB	NB	SB
HCM Control Delay, \$ 1620.8		\$ 469.6	0.7	2.7
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1WBLn1WBLn2	SBL	SBT	SBR
Capacity (veh/h)	575	-	10 4 286 389	-	-	-
HCM Lane V/C Ratio	0.152	-	2.946 3.955 0.313 0.451	-	-	-
HCM Control Delay (s)	12.4	\$ 1620.8	\$ 2999.3 23.2 21.6	-	-	-
HCM Lane LOS	B	-	F F C C	-	-	-
HCM 95th %tile Q(veh)	0.5	-	4.8 3.3 1.3 2.3	-	-	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon













Synchro Report - Signalized Intersections
130: Great SW Pkwy

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	762	0	100	1570	0	0	9	0	0	59	0
Future Volume (vph)	100	762	0	100	1570	0	0	9	0	0	59	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		250	300		300	0		0	0		0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Flt												
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1570	3139	1652	1570	3139	1652	0	2407	0	0	2407	0
Flt Permitted	0.036			0.237								
Satd. Flow (perm)	59	3139	1652	392	3139	1652	0	2407	0	0	2407	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		642			731			251			574	
Travel Time (s)		14.6			16.6			5.7			13.0	
Peak Hour Factor	0.92	0.80	0.92	0.92	0.80	0.92	0.92	0.45	0.92	0.87	0.87	0.92
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	15%	15%	15%	15%	15%	15%	50%	50%	50%	50%	50%	50%
Adj. Flow (vph)	126	1105	0	126	2277	0	0	23	0	0	79	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	126	1105	0	126	2277	0	0	23	0	0	79	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm		NA			NA	

Synchro Report - Signalized Intersections
130: Great SW Pkwy

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5		22.5	22.5	
Total Split (s)	13.0	113.1	113.1	14.4	114.5	114.5	22.5	22.5		22.5	22.5	
Total Split (%)	8.7%	75.4%	75.4%	9.6%	76.3%	76.3%	15.0%	15.0%		15.0%	15.0%	
Maximum Green (s)	8.5	108.6	108.6	9.9	110.0	110.0	18.0	18.0		18.0	18.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5			4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0		0	0	
Act Effect Green (s)	119.8	111.3		117.2	110.0			10.0			10.0	
Actuated g/C Ratio	0.84	0.78		0.83	0.77			0.07			0.07	
v/c Ratio	0.90	0.45		0.33	0.94			0.14			0.47	
Control Delay	90.7	6.0		4.0	22.7			63.3			72.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	90.7	6.0		4.0	22.7			63.3			72.4	
LOS	F	A		A	C			E			E	
Approach Delay		14.7			21.8			63.3			72.4	
Approach LOS		B			C			E			E	
90th %ile Green (s)	8.5	109.9	109.9	8.6	110.0	110.0	13.4	13.4		13.4	13.4	
90th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Hold	Hold		Gap	Gap	
70th %ile Green (s)	8.5	110.8	110.8	7.7	110.0	110.0	11.4	11.4		11.4	11.4	
70th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Hold	Hold		Gap	Gap	
50th %ile Green (s)	8.5	111.4	111.4	7.1	110.0	110.0	10.0	10.0		10.0	10.0	
50th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Hold	Hold		Gap	Gap	
30th %ile Green (s)	8.5	111.9	111.9	6.6	110.0	110.0	8.7	8.7		8.7	8.7	
30th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Hold	Hold		Gap	Gap	
10th %ile Green (s)	8.5	112.5	112.5	6.0	110.0	110.0	6.7	6.7		6.7	6.7	
10th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Hold	Hold		Gap	Gap	
Queue Length 50th (ft)	72	153		12	789			10			37	
Queue Length 95th (ft)	#208	183		26	717			13			64	
Internal Link Dist (ft)		562			651			171			494	
Turn Bay Length (ft)	300			300								
Base Capacity (vph)	140	2460		413	2431			305			305	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.90	0.45		0.31	0.94			0.08			0.26	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 142

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 20.8 Intersection LOS: C

Intersection Capacity Utilization 72.2% ICU Level of Service C

Analysis Period (min) 15

90th %ile Actuated Cycle: 145.4

70th %ile Actuated Cycle: 143.4

50th %ile Actuated Cycle: 142





30th %ile Actuated Cycle: 140.7

10th %ile Actuated Cycle: 138.7

95th percentile volume exceeds capacity, queue may be longer.












Queue shown is maximum after two cycles.

Splits and Phases: 130: Great SW Pkwy

 Ø1	 Ø2	 Ø4
14.4 s	113.1 s	22.5 s
 Ø5	 Ø6	 Ø8
13 s	114.5 s	22.5 s







Synchro Report - Signalized Intersections
140: Bakers Ferry Rd.

Future 2031 - AM
06/27/2021

						
Lane Group	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	69	24	1236	72	47	1181
Future Volume (vph)	69	24	1236	72	47	1181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		300	300	
Storage Lanes	1	0		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	0.965			0.850		
Flt Protected	0.964				0.950	
Satd. Flow (prot)	1544	0	3112	1524	1570	3112
Flt Permitted	0.964				0.098	
Satd. Flow (perm)	1544	0	3112	1524	162	3112
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	22			87		
Link Speed (mph)	30		30			30
Link Distance (ft)	676		615			670
Travel Time (s)	15.4		14.0			15.2
Peak Hour Factor	0.75	0.75	0.96	0.96	0.70	0.70
Growth Factor	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	15%	13%	16%	6%	15%	16%
Adj. Flow (vph)	107	37	1494	87	78	1957
Shared Lane Traffic (%)						
Lane Group Flow (vph)	144	0	1494	87	78	1957
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (ft)	20		100	20	20	100
Trailing Detector (ft)	0		0	0	0	0
Detector 1 Position(ft)	0		0	0	0	0
Detector 1 Size(ft)	20		6	20	20	6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Perm	pm+pt	NA

Synchro Report - Signalized Intersections
140: Bakers Ferry Rd.

Future 2031 - AM
06/27/2021

						
Lane Group	NBL	NBR	NET	NER	SWL	SWT
Protected Phases	8		2		1	6
Permitted Phases				2	6	
Detector Phase	8		2	2	1	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	9.5	22.5
Total Split (s)	22.5		43.0	43.0	9.5	52.5
Total Split (%)	30.0%		57.3%	57.3%	12.7%	70.0%
Maximum Green (s)	18.0		38.5	38.5	5.0	48.0
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Min	Min	None	Min
Walk Time (s)	7.0		7.0	7.0		7.0
Flash Dont Walk (s)	11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)	0		0	0		0
Act Effect Green (s)	10.6		43.4	43.4	49.7	50.8
Actuated g/C Ratio	0.16		0.65	0.65	0.74	0.76
v/c Ratio	0.55		0.74	0.09	0.35	0.83
Control Delay	30.0		15.4	2.4	8.0	13.0
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	30.0		15.4	2.4	8.0	13.0
LOS	C		B	A	A	B
Approach Delay	30.0		14.7			12.8
Approach LOS	C		B			B
90th %ile Green (s)	16.0		38.5	38.5	5.0	48.0
90th %ile Term Code	Gap		Max	Max	Max	Max
70th %ile Green (s)	12.7		38.5	38.5	5.0	48.0
70th %ile Term Code	Gap		Max	Max	Max	Max
50th %ile Green (s)	10.6		38.5	38.5	5.0	48.0
50th %ile Term Code	Gap		Max	Max	Max	Max
30th %ile Green (s)	8.7		39.0	39.0	5.0	48.5
30th %ile Term Code	Gap		Dwell	Dwell	Max	Dwell
10th %ile Green (s)	0.0		54.0	54.0	0.0	54.0
10th %ile Term Code	Skip		Dwell	Dwell	Skip	Dwell
Queue Length 50th (ft)	47		242	0	8	262
Queue Length 95th (ft)	77		#467	19	18	270
Internal Link Dist (ft)	596		535			590
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	433		2015	1017	225	2358
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.33		0.74	0.09	0.35	0.83

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 67

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 14.2

Intersection LOS: B

Intersection Capacity Utilization 58.9%

ICU Level of Service B

Analysis Period (min) 15

90th %ile Actuated Cycle: 73

70th %ile Actuated Cycle: 69.7

50th %ile Actuated Cycle: 67.6

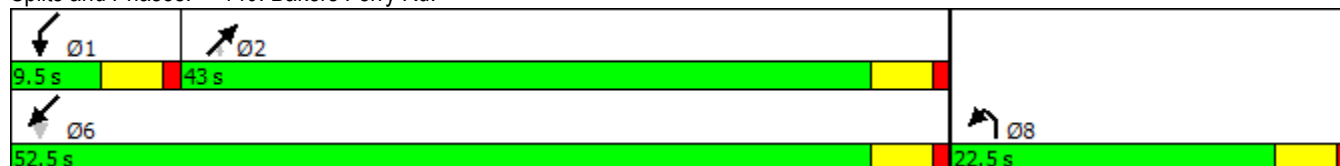
30th %ile Actuated Cycle: 66.2

10th %ile Actuated Cycle: 58.5

95th percentile volume exceeds capacity, queue may be longer.





















Queue shown is maximum after two cycles.

Splits and Phases: 140: Bakers Ferry Rd.















Synchro Report - Signalized Intersections
150: Mendel Dr./Wharton Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	35	7	7	13	7	26	29	1073	20	66	1329	152
Future Volume (vph)	35	7	7	13	7	26	29	1073	20	66	1329	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	300		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Frt		0.925			0.924			0.997			0.985	
Flt Protected	0.950				0.986		0.950			0.950		
Satd. Flow (prot)	1399	1643	0	0	1324	0	1687	4536	0	1467	4583	0
Flt Permitted	0.926				0.897		0.950			0.950		
Satd. Flow (perm)	1364	1643	0	0	1205	0	1687	4536	0	1467	4583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			40			4			38	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		409			537			753			584	
Travel Time (s)		9.3			12.2			17.1			13.3	
Peak Hour Factor	0.71	0.71	0.71	0.76	0.76	0.76	0.97	0.97	0.97	0.68	0.68	0.68
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	29%	0%	14%	31%	0%	39%	7%	14%	15%	23%	12%	7%
Adj. Flow (vph)	57	11	11	20	11	40	35	1283	24	113	2267	259
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	22	0	0	71	0	35	1307	0	113	2526	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	

Synchro Report - Signalized Intersections
150: Mendel Dr./Wharton Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	22.6	22.6		22.6	22.6		9.6	35.4		17.0	42.8	
Total Split (%)	30.1%	30.1%		30.1%	30.1%		12.8%	47.2%		22.7%	57.1%	
Maximum Green (s)	18.1	18.1		18.1	18.1		5.1	30.9		12.5	38.3	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)	8.5	8.5			8.2		5.2	35.7		9.6	45.6	
Actuated g/C Ratio	0.14	0.14			0.14		0.09	0.60		0.16	0.77	
v/c Ratio	0.29	0.09			0.35		0.24	0.48		0.48	0.72	
Control Delay	28.2	18.5			19.3		33.0	11.1		30.9	11.0	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	28.2	18.5			19.3		33.0	11.1		30.9	11.0	
LOS	C	B			B		C	B		C	B	
Approach Delay		25.5			19.3			11.7			11.8	
Approach LOS		C			B			B			B	
90th %ile Green (s)	12.5	12.5		12.5	12.5		5.1	30.9		12.5	38.3	
90th %ile Term Code	Gap	Gap		Hold	Hold		Max	Max		Max	Max	
70th %ile Green (s)	10.1	10.1		10.1	10.1		5.1	31.4		12.0	38.3	
70th %ile Term Code	Gap	Gap		Hold	Hold		Max	Hold		Gap	Max	
50th %ile Green (s)	8.4	8.4		8.4	8.4		0.0	27.7		10.1	42.3	
50th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Gap		Gap	Hold	
30th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	26.9		7.6	39.0	
30th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Dwell		Gap	Dwell	
10th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	53.3		0.0	53.3	
10th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Dwell		Skip	Dwell	
Queue Length 50th (ft)	19	4			10		12	121		37	160	
Queue Length 95th (ft)	40	16			34		41	196		65	247	
Internal Link Dist (ft)		329			457			673			504	
Turn Bay Length (ft)							300			300		
Base Capacity (vph)	426	521			404		148	2851		316	3521	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.13	0.04			0.18		0.24	0.46		0.36	0.72	

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 59.5

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 12.2

Intersection LOS: B

Intersection Capacity Utilization 58.9%

ICU Level of Service B

Analysis Period (min) 15

90th %ile Actuated Cycle: 69.4

70th %ile Actuated Cycle: 67

50th %ile Actuated Cycle: 59.7

30th %ile Actuated Cycle: 43.5





















10th %ile Actuated Cycle: 57.8

Splits and Phases: 150: Mendel Dr./Wharton Dr.















Synchro Report - Signalized Intersections
160: Marvin Miller Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	0	7	4	0	14	15	1225	11	9	1415	58
Future Volume (vph)	20	0	7	4	0	14	15	1225	11	9	1415	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		250	200		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Frt		0.966			0.928				0.850		0.994	
Flt Protected		0.964			0.977		0.950			0.950		
Satd. Flow (prot)	0	1413	0	0	1273	0	1687	4550	1404	1467	4612	0
Flt Permitted		0.800			0.864		0.950			0.950		
Satd. Flow (perm)	0	1173	0	0	1126	0	1687	4550	1404	1467	4612	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		44			44				44		10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		720			447			1232			950	
Travel Time (s)		16.4			10.2			28.0			21.6	
Peak Hour Factor	0.57	0.57	0.57	0.25	0.75	0.75	0.91	0.91	0.91	0.73	0.73	0.73
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	29%	0%	14%	31%	0%	39%	7%	14%	15%	23%	12%	7%
Adj. Flow (vph)	41	0	14	19	0	22	19	1562	14	14	2248	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	55	0	0	41	0	19	1562	14	14	2340	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	

Synchro Report - Signalized Intersections
160: Marvin Miller Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5	22.5	9.5	22.5	
Total Split (s)	25.0	25.0		25.0	25.0		12.0	113.0	113.0	12.0	113.0	
Total Split (%)	16.7%	16.7%		16.7%	16.7%		8.0%	75.3%	75.3%	8.0%	75.3%	
Maximum Green (s)	20.5	20.5		20.5	20.5		7.5	108.5	108.5	7.5	108.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		None	C-Min	C-Min	Min	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	
Act Effect Green (s)		8.1			8.1		7.3	123.3	123.3	7.1	128.2	
Actuated g/C Ratio		0.05			0.05		0.05	0.82	0.82	0.05	0.85	
v/c Ratio		0.53			0.40		0.23	0.42	0.01	0.20	0.59	
Control Delay		41.8			27.4		74.9	4.5	0.0	77.7	7.2	
Queue Delay		0.1			0.0		0.0	0.1	0.0	0.0	0.3	
Total Delay		41.9			27.4		74.9	4.6	0.0	77.7	7.4	
LOS		D			C		E	A	A	E	A	
Approach Delay		41.9			27.4			5.4			7.9	
Approach LOS		D			C			A			A	
90th %ile Green (s)	13.1	13.1		13.1	13.1		9.5	114.2	114.2	9.2	113.9	
90th %ile Term Code	Gap	Gap		Hold	Hold		Gap	Coord	Coord	Gap	Coord	
70th %ile Green (s)	9.4	9.4		9.4	9.4		8.1	119.2	119.2	7.9	119.0	
70th %ile Term Code	Gap	Gap		Hold	Hold		Gap	Coord	Coord	Gap	Coord	
50th %ile Green (s)	6.9	6.9		6.9	6.9		7.1	122.7	122.7	6.9	122.5	
50th %ile Term Code	Gap	Gap		Hold	Hold		Gap	Coord	Coord	Gap	Coord	
30th %ile Green (s)	5.5	5.5		5.5	5.5		0.0	125.1	125.1	5.9	135.5	
30th %ile Term Code	Gap	Gap		Gap	Gap		Skip	Coord	Coord	Gap	Coord	
10th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	135.5	135.5	5.5	145.5	
10th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Coord	Coord	Gap	Coord	
Queue Length 50th (ft)		11			0		18	128	0	15	160	
Queue Length 95th (ft)		20			24		47	204	0	m11	m0	
Internal Link Dist (ft)		640			367			1152			870	
Turn Bay Length (ft)							250		250	200		
Base Capacity (vph)		198			191		90	3741	1162	77	3942	
Starvation Cap Reductn		0			0		0	0	0	0	758	
Spillback Cap Reductn		6			0		0	681	0	0	0	
Storage Cap Reductn		0			0		0	0	0	0	0	
Reduced v/c Ratio		0.29			0.21		0.21	0.51	0.01	0.18	0.73	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 58 (39%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 7.6

Intersection LOS: A




Intersection Capacity Utilization 45.5%

ICU Level of Service A

Analysis Period (min) 15




















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 160: Marvin Miller Dr.

 Ø1	 Ø2 (R)	 Ø4
12 s	113 s	25 s
 Ø5	 Ø6 (R)	 Ø8
12 s	113 s	25 s













Synchro Report - Signalized Intersections
170: Patton Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	51	0	0	527	0	175	2432	0	17	1647	0
Future Volume (vph)	0	51	0	0	527	0	175	2432	0	17	1647	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		0	300		0
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Flt												
Flt Protected							0.950			0.950		
Satd. Flow (prot)	0	1863	0	0	1863	0	1770	5085	0	1770	5085	1863
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1863	0	0	1863	0	1770	5085	0	1770	5085	1863
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		749			928			950			975	
Travel Time (s)		17.0			21.1			21.6			22.2	
Peak Hour Factor	0.85	0.85	0.85	0.92	0.88	0.92	0.47	0.88	0.92	0.53	0.73	0.92
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	0	70	0	0	695	0	432	3206	0	37	2617	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	695	0	432	3206	0	37	2617	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA			NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	

Synchro Report - Signalized Intersections
170: Patton Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	4			8								6
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	22.5
Total Split (s)	50.0	50.0		50.0	50.0		33.0	90.5		9.5	67.0	67.0
Total Split (%)	33.3%	33.3%		33.3%	33.3%		22.0%	60.3%		6.3%	44.7%	44.7%
Maximum Green (s)	45.5	45.5		45.5	45.5		28.5	86.0		5.0	62.5	62.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0			0	0
Act Effect Green (s)		45.5			45.5		28.5	87.9		5.0	62.5	
Actuated g/C Ratio		0.30			0.30		0.19	0.59		0.03	0.42	
v/c Ratio		0.12			1.23		1.29	1.08		0.63	1.24	
Control Delay		38.7			162.0		198.8	70.5		112.2	148.2	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		38.7			162.0		198.8	70.5		112.2	148.2	
LOS		D			F		F	E		F	F	
Approach Delay		38.7			162.0			85.7			147.7	
Approach LOS		D			F			F			F	
90th %ile Green (s)	45.5	45.5		45.5	45.5		28.5	86.0		5.0	62.5	62.5
90th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Max	Coord	Coord
70th %ile Green (s)	45.5	45.5		45.5	45.5		28.5	86.0		5.0	62.5	62.5
70th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Max	Coord	Coord
50th %ile Green (s)	45.5	45.5		45.5	45.5		28.5	86.0		5.0	62.5	62.5
50th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Max	Coord	Coord
30th %ile Green (s)	45.5	45.5		45.5	45.5		28.5	86.0		5.0	62.5	62.5
30th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Max	Coord	Coord
10th %ile Green (s)	45.5	45.5		45.5	45.5		28.5	95.5		0.0	62.5	62.5
10th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Skip	Coord	Coord
Queue Length 50th (ft)		50			~837		~544	~1302		36	~1157	
Queue Length 95th (ft)		85			#1046		279	#1315		46	#855	
Internal Link Dist (ft)		669			848			870			895	
Turn Bay Length (ft)							200			300		
Base Capacity (vph)		565			565		336	2979		59	2118	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.12			1.23		1.29	1.08		0.63	1.24	
Intersection Summary												

Synchro Report - Signalized Intersections

170: Patton Dr.

Future 2031 - AM
06/27/2021

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 58 (39%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.29

Intersection Signal Delay: 116.1

Intersection LOS: F

Intersection Capacity Utilization 102.1%

ICU Level of Service G

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.



















Queue shown is maximum after two cycles.

Splits and Phases: 170: Patton Dr.















Synchro Report - Signalized Intersections
180: Commerce Cir.

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	9	1311	4	84	1648	2	12	0	4	12	0	21
Future Volume (vph)	9	1311	4	84	1648	2	12	0	4	12	0	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Frt								0.966			0.913	
Flt Protected	0.950			0.950				0.964			0.982	
Satd. Flow (prot)	1504	4427	0	902	5684	0	0	1594	0	0	939	0
Flt Permitted	0.950			0.950				0.789			0.872	
Satd. Flow (perm)	1504	4427	0	902	5684	0	0	1305	0	0	834	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)								95			95	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		760			245			480			470	
Travel Time (s)		17.3			5.6			10.9			10.7	
Peak Hour Factor	0.95	0.95	0.95	0.79	0.79	0.79	0.77	0.77	0.77	0.72	0.72	0.72
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	20%	17%	73%	100%	15%	9%	5%	0%	29%	100%	0%	71%
Adj. Flow (vph)	11	1601	5	123	2420	3	18	0	6	19	0	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	1606	0	123	2423	0	0	24	0	0	53	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	

Synchro Report - Signalized Intersections
180: Commerce Cir.

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Protected Phases	5	2		1	6			4				8
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	9.5	62.0		35.0	87.5		23.0	23.0		23.0	23.0	
Total Split (%)	7.9%	51.7%		29.2%	72.9%		19.2%	19.2%		19.2%	19.2%	
Maximum Green (s)	5.0	57.5		30.5	83.0		18.5	18.5		18.5	18.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	6.5	81.2		21.5	105.6			5.8			5.8	
Actuated g/C Ratio	0.05	0.68		0.18	0.88			0.05			0.05	
v/c Ratio	0.14	0.54		0.76	0.48			0.16			0.41	
Control Delay	57.2	12.3		77.3	2.6			2.2			11.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	57.2	12.3		77.3	2.6			2.2			11.1	
LOS	E	B		E	A			A			B	
Approach Delay		12.6			6.2			2.2			11.1	
Approach LOS		B			A			A			B	
90th %ile Green (s)	8.1	68.2		31.5	91.6		6.8	6.8		6.8	6.8	
90th %ile Term Code	Gap	Coord		Gap	Coord		Hold	Hold		Gap	Gap	
70th %ile Green (s)	0.0	75.2		25.8	105.5		5.5	5.5		5.5	5.5	
70th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Gap	Gap	
50th %ile Green (s)	0.0	79.4		21.6	105.5		5.5	5.5		5.5	5.5	
50th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Gap	Gap	
30th %ile Green (s)	0.0	83.6		17.4	105.5		5.5	5.5		5.5	5.5	
30th %ile Term Code	Skip	Coord		Gap	Coord		Hold	Hold		Gap	Gap	
10th %ile Green (s)	0.0	99.7		11.3	115.5		0.0	0.0		0.0	0.0	
10th %ile Term Code	Skip	Coord		Gap	Coord		Skip	Skip		Skip	Skip	
Queue Length 50th (ft)	8	221		99	122			0			0	
Queue Length 95th (ft)	28	343		146	93			0			0	
Internal Link Dist (ft)		680			165			400			390	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	81	2996		230	5003			281			208	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.14	0.54		0.53	0.48			0.09			0.25	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 116 (97%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 8.7

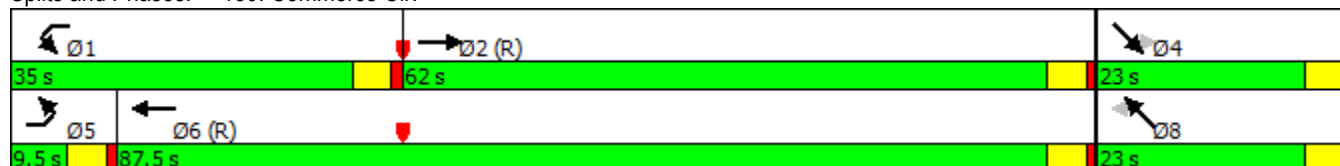
Intersection LOS: A

Intersection Capacity Utilization 50.3%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 180: Commerce Cir.



Synchro Report - Unsignalized Intersections
190: Fulton Ind. Circle

Future 2031 - AM
06/27/2021





















Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↑
Traffic Volume (vph)	0	1372	1717	33	0	17
Future Volume (vph)	0	1372	1717	33	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.86	0.86	0.86	1.00	1.00
Frt			0.997			0.865
Flt Protected						
Satd. Flow (prot)	0	6408	6389	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	6408	6389	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		245	541		662	
Travel Time (s)		5.6	12.3		15.0	
Peak Hour Factor	0.96	0.96	0.78	0.78	0.53	0.53
Growth Factor	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	0	1658	2553	49	0	37
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1658	2602	0	0	37
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 39.5% ICU Level of Service A
Analysis Period (min) 15













Synchro Report - Signalized Intersections
200: Shirley Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	1337	14	72	1704	1	15	0	52	1	0	0
Future Volume (vph)	6	1337	14	72	1704	1	15	0	52	1	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998						0.895				
Flt Protected	0.950			0.950				0.989			0.950	
Satd. Flow (prot)	1770	6395	0	1770	6408	0	0	1649	0	0	1770	0
Flt Permitted	0.950			0.950				0.923			0.588	
Satd. Flow (perm)	1770	6395	0	1770	6408	0	0	1539	0	0	1095	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2						95				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		541			537			437			323	
Travel Time (s)		12.3			12.2			9.9			7.3	
Peak Hour Factor	0.99	0.99	0.99	0.78	0.78	0.78	0.86	0.86	0.86	0.50	0.50	0.50
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	7	1567	16	107	2534	1	20	0	70	2	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	1583	0	107	2535	0	0	90	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	

Synchro Report - Signalized Intersections
200: Shirley Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							8			4		
Detector Phase	5	2			1	6	8	8			4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0	5.0			5.0	5.0
Minimum Split (s)	9.5	22.5			9.5	22.5	22.5	22.5			22.5	22.5
Total Split (s)	11.0	69.0			25.0	83.0	26.0	26.0			26.0	26.0
Total Split (%)	9.2%	57.5%			20.8%	69.2%	21.7%	21.7%			21.7%	21.7%
Maximum Green (s)	6.5	64.5			20.5	78.5	21.5	21.5			21.5	21.5
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5	3.5			3.5	3.5
All-Red Time (s)	1.0	1.0			1.0	1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)	0.0	0.0			0.0	0.0			0.0			0.0
Total Lost Time (s)	4.5	4.5			4.5	4.5			4.5			4.5
Lead/Lag	Lead	Lag			Lead	Lag						
Lead-Lag Optimize?	Yes	Yes			Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0			3.0	3.0
Recall Mode	Min	C-Max			Min	C-Max	None	None			None	None
Walk Time (s)	7.0				7.0		7.0	7.0			7.0	7.0
Flash Dont Walk (s)	11.0				11.0		11.0	11.0			11.0	11.0
Pedestrian Calls (#/hr)	0				0		0	0			0	0
Act Effct Green (s)	6.1	87.1			12.6	93.6			6.8			6.8
Actuated g/C Ratio	0.05	0.73			0.10	0.78			0.06			0.06
v/c Ratio	0.08	0.34			0.58	0.51			0.51			0.03
Control Delay	50.9	3.7			67.9	2.3			19.9			53.0
Queue Delay	0.0	0.0			0.0	0.1			0.0			0.0
Total Delay	50.9	3.7			67.9	2.4			19.9			53.0
LOS	D	A			E	A			B			D
Approach Delay	3.9				5.1				19.9			53.0
Approach LOS	A				A				B			D
90th %ile Green (s)	7.2	78.7			17.4	88.9	10.4	10.4			10.4	10.4
90th %ile Term Code	Gap	Coord			Gap	Coord	Gap	Gap			Hold	Hold
70th %ile Green (s)	6.4	84.7			14.6	92.9	7.2	7.2			7.2	7.2
70th %ile Term Code	Gap	Coord			Gap	Coord	Gap	Gap			Hold	Hold
50th %ile Green (s)	5.9	88.3			12.6	95.0	5.6	5.6			5.6	5.6
50th %ile Term Code	Gap	Coord			Gap	Coord	Hold	Hold			Hold	Hold
30th %ile Green (s)	5.5	90.4			10.6	95.5	5.5	5.5			5.5	5.5
30th %ile Term Code	Gap	Coord			Gap	Coord	Gap	Gap			Hold	Hold
10th %ile Green (s)	5.5	93.3			7.7	95.5	5.5	5.5			5.5	5.5
10th %ile Term Code	Gap	Coord			Gap	Coord	Gap	Gap			Hold	Hold
Queue Length 50th (ft)	6	15			83	56			0			2
Queue Length 95th (ft)	m11	59			m107	m86			42			6
Internal Link Dist (ft)	461				457				357			243
Turn Bay Length (ft)	300			150								
Base Capacity (vph)	97	4641			302	4996			353			196
Starvation Cap Reductn	0	0			0	744			0			0
Spillback Cap Reductn	0	0			0	0			0			0
Storage Cap Reductn	0	0			0	0			0			0
Reduced v/c Ratio	0.07	0.34			0.35	0.60			0.25			0.01
Intersection Summary												

Synchro Report - Signalized Intersections

200: Shirley Dr.

Future 2031 - AM

06/27/2021

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 111 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 5.0

Intersection LOS: A

Intersection Capacity Utilization 48.4%

ICU Level of Service A

Analysis Period (min) 15




















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Shirley Dr.















Synchro Report - Signalized Intersections
210: I-20 EB Ramp

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	326	0	373	0	0	0	0	792	1211	579	1548	0
Future Volume (vph)	326	0	373	0	0	0	0	792	1211	579	1548	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	225		0	0		0
Storage Lanes	2		1	0		0	0		2	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.88	1.00	0.91	1.00
Frt			0.850						0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	3242	0	1524	0	0	0	0	5836	2538	1719	4631	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	3242	0	1524	0	0	0	0	5836	2538	1719	4631	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55						838			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		758			734			537			524	
Travel Time (s)		17.2			16.7			12.2			11.9	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.97	0.97	0.97	0.94	0.94	0.94
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	8%	2%	6%	2%	2%	2%	12%	12%	12%	5%	12%	2%
Adj. Flow (vph)	430	0	492	0	0	0	0	947	1448	715	1910	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	430	0	492	0	0	0	0	947	1448	715	1910	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1					2	1	1	2	
Detector Template	Left		Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20		20					100	20	20	100	
Trailing Detector (ft)	0		0					0	0	0	0	
Detector 1 Position(ft)	0		0					0	0	0	0	
Detector 1 Size(ft)	20		20					6	20	20	6	
Detector 1 Type	Cl+Ex		Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Prot		Perm					NA	Perm	Prot	NA	

Synchro Report - Signalized Intersections
210: I-20 EB Ramp

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	7							2		1	6	
Permitted Phases			7						2			
Detector Phase	7		7					2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0		5.0					5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5		9.5					22.5	22.5	9.5	22.5	
Total Split (s)	32.0		32.0					42.0	42.0	46.0	88.0	
Total Split (%)	26.7%		26.7%					35.0%	35.0%	38.3%	73.3%	
Maximum Green (s)	27.5		27.5					37.5	37.5	41.5	83.5	
Yellow Time (s)	3.5		3.5					3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0		1.0					1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5		4.5					4.5	4.5	4.5	4.5	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0		3.0					3.0	3.0	3.0	3.0	
Recall Mode	None		None					C-Min	C-Min	None	C-Min	
Walk Time (s)								7.0	7.0		7.0	
Flash Dont Walk (s)								11.0	11.0		11.0	
Pedestrian Calls (#/hr)								0	0		0	
Act Effct Green (s)	27.5		27.5					37.5	37.5	41.5	83.5	
Actuated g/C Ratio	0.23		0.23					0.31	0.31	0.35	0.70	
v/c Ratio	0.58		1.26					0.52	1.06	1.20	0.59	
Control Delay	44.8		170.4					26.6	54.5	138.8	7.9	
Queue Delay	0.0		0.0					0.0	17.3	0.3	0.4	
Total Delay	44.8		170.4					26.6	71.9	139.1	8.4	
LOS	D		F					C	E	F	A	
Approach Delay		111.8						53.9			44.0	
Approach LOS		F						D			D	
90th %ile Green (s)	27.5		27.5					37.5	37.5	41.5	83.5	
90th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
70th %ile Green (s)	27.5		27.5					37.5	37.5	41.5	83.5	
70th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
50th %ile Green (s)	27.5		27.5					37.5	37.5	41.5	83.5	
50th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
30th %ile Green (s)	27.5		27.5					37.5	37.5	41.5	83.5	
30th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
10th %ile Green (s)	27.5		27.5					37.5	37.5	41.5	83.5	
10th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
Queue Length 50th (ft)	153		~445					174	~426	~665	279	
Queue Length 95th (ft)	202		#637					136	#622	#905	209	
Internal Link Dist (ft)		678			654			457			444	
Turn Bay Length (ft)												
Base Capacity (vph)	742		391					1823	1369	594	3222	
Starvation Cap Reductn	0		0					0	72	25	717	
Spillback Cap Reductn	0		0					0	0	0	0	
Storage Cap Reductn	0		0					0	0	0	0	
Reduced v/c Ratio	0.58		1.26					0.52	1.12	1.26	0.76	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 13 (11%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.26

Intersection Signal Delay: 58.5

Intersection LOS: E

Intersection Capacity Utilization 108.4%

ICU Level of Service G

Analysis Period (min) 15

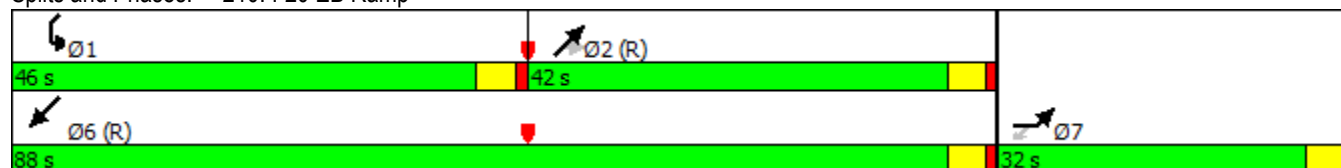
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.



















Queue shown is maximum after two cycles.

Splits and Phases: 210: I-20 EB Ramp















Synchro Report - Signalized Intersections
220: I-20 WB Ramp

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	1000	0	326	104	964	0	0	1158	192
Future Volume (vph)	0	0	0	1000	0	326	104	964	0	0	1158	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		400	0		0	0		0
Storage Lanes	0		0	3		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.94	1.00	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Frt						0.850					0.979	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	4545	0	1524	1517	4715	0	0	5972	0
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	4545	0	1524	1517	4715	0	0	5972	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						58					39	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		487			795			524			744	
Travel Time (s)		11.1			18.1			11.9			16.9	
Peak Hour Factor	0.92	0.92	0.92	0.91	0.91	0.91	0.92	0.92	0.92	0.90	0.90	0.90
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	2%	2%	2%	12%	2%	6%	19%	10%	2%	16%	8%	2%
Adj. Flow (vph)	0	0	0	1275	0	416	131	1215	0	0	1493	247
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	1275	0	416	131	1215	0	0	1740	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		36			36			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	
Detector Template				Left		Right	Left	Thru			Thru	
Leading Detector (ft)				20		20	20	100			100	
Trailing Detector (ft)				0		0	0	0			0	
Detector 1 Position(ft)				0		0	0	0			0	
Detector 1 Size(ft)				20		20	20	6			6	
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Prot		Perm	Prot	NA			NA	

Synchro Report - Signalized Intersections
220: I-20 WB Ramp

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases				3			5	2			6	
Permitted Phases						8						
Detector Phase				3		8	5	2			6	
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	
Minimum Split (s)				9.5		22.5	9.5	22.5			22.5	
Total Split (s)				49.0		49.0	23.0	71.0			48.0	
Total Split (%)				40.8%		40.8%	19.2%	59.2%			40.0%	
Maximum Green (s)				44.5		44.5	18.5	66.5			43.5	
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	
Recall Mode				None		None	None	C-Min			C-Min	
Walk Time (s)						7.0		7.0			7.0	
Flash Dont Walk (s)						11.0		11.0			11.0	
Pedestrian Calls (#/hr)						0		0			0	
Act Effect Green (s)				40.2		40.2	14.9	70.8			51.4	
Actuated g/C Ratio				0.34		0.34	0.12	0.59			0.43	
v/c Ratio				0.84		0.76	0.70	0.44			0.67	
Control Delay				42.3		39.7	58.0	6.7			25.8	
Queue Delay				0.0		0.0	0.0	0.2			0.4	
Total Delay				42.3		39.7	58.0	6.9			26.3	
LOS				D		D	E	A			C	
Approach Delay					41.7			11.9			26.3	
Approach LOS					D			B			C	
90th %ile Green (s)				44.5		44.5	18.5	66.5			43.5	
90th %ile Term Code				Max		Max	Max	Coord			Coord	
70th %ile Green (s)				43.3		43.3	18.1	67.7			45.1	
70th %ile Term Code				Gap		Hold	Gap	Coord			Coord	
50th %ile Green (s)				41.0		41.0	15.6	70.0			49.9	
50th %ile Term Code				Gap		Hold	Gap	Coord			Coord	
30th %ile Green (s)				38.0		38.0	13.0	73.0			55.5	
30th %ile Term Code				Gap		Hold	Gap	Coord			Coord	
10th %ile Green (s)				34.3		34.3	9.4	76.7			62.8	
10th %ile Term Code				Gap		Hold	Gap	Coord			Coord	
Queue Length 50th (ft)				318		247	94	224			259	
Queue Length 95th (ft)				359		357	158	252			330	
Internal Link Dist (ft)		407			715			444			664	
Turn Bay Length (ft)						400						
Base Capacity (vph)				1685		601	233	2781			2578	
Starvation Cap Reductn				0		0	0	740			0	
Spillback Cap Reductn				6		0	0	0			359	
Storage Cap Reductn				0		0	0	0			0	
Reduced v/c Ratio				0.76		0.69	0.56	0.60			0.78	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 62 (52%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 27.7

Intersection LOS: C

Intersection Capacity Utilization 108.4%

ICU Level of Service G



















Analysis Period (min) 15













Splits and Phases: 220: I-20 WB Ramp



Synchro Report - Signalized Intersections
230: Wendell Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	76	934	110	22	736	25	10	3	24	68	6	12
Future Volume (vph)	76	934	110	22	736	25	10	3	24	68	6	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	200		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984			0.995			0.911			0.981	
Flt Protected	0.950			0.950				0.987			0.962	
Satd. Flow (prot)	1597	4658	0	1805	4614	0	0	1564	0	0	1572	0
Flt Permitted	0.273			0.187				0.914			0.733	
Satd. Flow (perm)	459	4658	0	355	4614	0	0	1448	0	0	1198	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		54			13			44			14	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			1498			395			449	
Travel Time (s)		16.9			34.0			9.0			10.2	
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.64	0.64	0.64	0.89	0.89	0.89
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	13%	10%	6%	0%	12%	8%	2%	2%	13%	16%	17%	2%
Adj. Flow (vph)	96	1178	139	29	970	33	18	5	44	89	8	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	96	1317	0	29	1003	0	0	67	0	0	113	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	37.5	37.5		37.5	37.5		22.5	22.5		22.5	22.5	
Total Split (%)	62.5%	62.5%		62.5%	62.5%		37.5%	37.5%		37.5%	37.5%	
Maximum Green (s)	33.0	33.0		33.0	33.0		18.0	18.0		18.0	18.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)	43.7	43.7		43.7	43.7			10.2			10.2	
Actuated g/C Ratio	0.73	0.73		0.73	0.73			0.17			0.17	
v/c Ratio	0.29	0.39		0.11	0.30			0.24			0.53	
Control Delay	5.5	3.3		6.0	5.0			11.9			27.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	5.5	3.3		6.0	5.0			11.9			27.9	
LOS	A	A		A	A			B			C	
Approach Delay		3.4			5.1			11.9			27.9	
Approach LOS		A			A			B			C	
90th %ile Green (s)	35.8	35.8		35.8	35.8		15.2	15.2		15.2	15.2	
90th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
70th %ile Green (s)	38.8	38.8		38.8	38.8		12.2	12.2		12.2	12.2	
70th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
50th %ile Green (s)	40.8	40.8		40.8	40.8		10.2	10.2		10.2	10.2	
50th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
30th %ile Green (s)	42.9	42.9		42.9	42.9		8.1	8.1		8.1	8.1	
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
10th %ile Green (s)	55.5	55.5		55.5	55.5		0.0	0.0		0.0	0.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		Skip	Skip		Skip	Skip	
Queue Length 50th (ft)	2	5		3	63			7			33	
Queue Length 95th (ft)	m56	118		m6	m78			18			68	
Internal Link Dist (ft)		664			1418			315			369	
Turn Bay Length (ft)	150			200								
Base Capacity (vph)	334	3404		258	3361			465			369	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.29	0.39		0.11	0.30			0.14			0.31	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 5 (8%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 5.3

Intersection LOS: A









Intersection Capacity Utilization 51.4%

ICU Level of Service A

Analysis Period (min) 15

























m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 230: Wendell Dr.

 Ø2 (R)  37.5 s	 Ø4  22.5 s
 Ø6 (R)  37.5 s	 Ø8  22.5 s













Synchro Report - Signalized Intersections
240: MLK Jr. Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	333	847	831	119	258	20	360	728	159	35	387	76
Future Volume (vph)	333	847	831	119	258	20	360	728	159	35	387	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	250		400	350		0	300		0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3273	3505	1553	3183	3539	1538	3335	3223	1455	3072	3034	1538
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3273	3505	1553	3183	3539	1538	3335	3223	1455	3072	3034	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			335			177			177			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1101			1180			1498			1729	
Travel Time (s)		25.0			26.8			34.0			39.3	
Peak Hour Factor	0.91	0.91	0.91	0.81	0.81	0.81	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	7%	3%	4%	10%	2%	5%	5%	12%	11%	14%	19%	5%
Adj. Flow (vph)	424	1080	1059	170	369	29	435	880	192	42	468	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	424	1080	1059	170	369	29	435	880	192	42	468	92
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm

Synchro Report - Signalized Intersections
240: MLK Jr. Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	27.6	63.0	63.0	11.0	46.4	46.4	20.3	36.5	36.5	9.5	25.7	25.7
Total Split (%)	23.0%	52.5%	52.5%	9.2%	38.7%	38.7%	16.9%	30.4%	30.4%	7.9%	21.4%	21.4%
Maximum Green (s)	23.1	58.5	58.5	6.5	41.9	41.9	15.8	32.0	32.0	5.0	21.2	21.2
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	20.1	58.5	58.5	6.5	44.9	44.9	15.8	33.9	33.9	5.0	21.2	21.2
Actuated g/C Ratio	0.17	0.49	0.49	0.05	0.37	0.37	0.13	0.28	0.28	0.04	0.18	0.18
v/c Ratio	0.77	0.63	1.14	0.99	0.28	0.04	0.99	0.97	0.36	0.33	0.87	0.22
Control Delay	57.7	24.9	98.2	122.6	27.5	0.1	88.2	52.7	3.8	54.7	64.6	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.7	24.9	98.2	122.6	27.5	0.1	88.2	52.7	3.8	54.7	64.6	9.6
LOS	E	C	F	F	C	A	F	D	A	D	E	A
Approach Delay		60.6			54.6			56.7			55.5	
Approach LOS		E			D			E			E	
90th %ile Green (s)	23.1	58.5	58.5	6.5	41.9	41.9	15.8	32.0	32.0	5.0	21.2	21.2
90th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	22.7	58.5	58.5	6.5	42.3	42.3	15.8	32.0	32.0	5.0	21.2	21.2
70th %ile Term Code	Gap	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	20.7	58.5	58.5	6.5	44.3	44.3	15.8	32.0	32.0	5.0	21.2	21.2
50th %ile Term Code	Gap	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Max	Coord	Coord
30th %ile Green (s)	18.6	58.5	58.5	6.5	46.4	46.4	15.8	32.0	32.0	5.0	21.2	21.2
30th %ile Term Code	Gap	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Max	Coord	Coord
10th %ile Green (s)	15.5	58.5	58.5	6.5	49.5	49.5	15.8	41.5	41.5	0.0	21.2	21.2
10th %ile Term Code	Gap	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	162	316	~819	69	105	0	140	~380	15	17	202	13
Queue Length 95th (ft)	214	388	#1078	#121	132	0	#274	#514	15	36	#281	22
Internal Link Dist (ft)		1021			1100			1418			1649	
Turn Bay Length (ft)				250		400	350			300		
Base Capacity (vph)	630	1708	928	172	1323	686	439	910	537	128	536	417
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.63	1.14	0.99	0.28	0.04	0.99	0.97	0.36	0.33	0.87	0.22

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 112 (93%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.14

Intersection Signal Delay: 58.3

Intersection LOS: E

Intersection Capacity Utilization 87.5%

ICU Level of Service E

Analysis Period (min) 15









~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.























Queue shown is maximum after two cycles.

Splits and Phases: 240: MLK Jr. Dr.

 Ø1	 Ø2 (R)	 Ø3	 Ø4
9.5 s	36.5 s	11 s	63 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
20.3 s	25.7 s	27.6 s	46.4 s













Synchro Report - Signalized Intersections
250: Old Gordon Rd.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	4	4	4	21	45	20	63	1064	20	8	332	20
Future Volume (vph)	4	4	4	21	45	20	63	1064	20	8	332	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	150		250
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.954				0.850			0.850
Flt Protected		0.976		0.950			0.950			0.950		
Satd. Flow (prot)	0	1818	1583	1770	1777	0	1770	3008	1583	1770	3008	1583
Flt Permitted		0.895		0.624			0.423			0.108		
Satd. Flow (perm)	0	1667	1583	1162	1777	0	788	3008	1583	201	3008	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95		18				95			95
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		617			886			1729			1350	
Travel Time (s)		14.0			20.1			39.3			30.7	
Peak Hour Factor	0.50	0.50	0.50	0.66	0.94	0.94	0.79	0.84	0.84	0.50	0.81	0.81
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	20%	2%	2%	20%	2%
Adj. Flow (vph)	9	9	9	37	56	25	93	1469	28	19	475	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	18	9	37	81	0	93	1469	28	19	475	29
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm

Synchro Report - Signalized Intersections
250: Old Gordon Rd.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases		6		5	2		7	4		3	8	
Permitted Phases	6		6	2			4		4	8		8
Detector Phase	6	6	6	5	2		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	23.4	23.4	23.4	9.6	33.0		9.8	77.5	77.5	9.5	77.2	77.2
Total Split (%)	19.5%	19.5%	19.5%	8.0%	27.5%		8.2%	64.6%	64.6%	7.9%	64.3%	64.3%
Maximum Green (s)	18.9	18.9	18.9	5.1	28.5		5.3	73.0	73.0	5.0	72.7	72.7
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Min	C-Min	C-Min	None	C-Min		None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0			0	0		0	0
Act Effect Green (s)		27.7	27.7	34.8	34.8		75.3	72.0	72.0	70.0	64.1	64.1
Actuated g/C Ratio		0.23	0.23	0.29	0.29		0.63	0.60	0.60	0.58	0.53	0.53
v/c Ratio		0.05	0.02	0.10	0.15		0.17	0.81	0.03	0.10	0.30	0.03
Control Delay		47.0	0.0	37.6	29.8		1.9	8.2	0.0	6.8	15.2	0.1
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		47.0	0.0	37.6	29.8		1.9	8.2	0.0	6.8	15.2	0.1
LOS		D	A	D	C		A	A	A	A	B	A
Approach Delay		31.3			32.3			7.7			14.1	
Approach LOS		C			C			A			B	
90th %ile Green (s)	8.9	8.9	8.9	6.2	19.6		8.3	80.7	80.7	6.2	78.6	78.6
90th %ile Term Code	Coord	Coord	Coord	Max	Coord		Gap	Gap	Gap	Gap	Hold	Hold
70th %ile Green (s)	14.7	14.7	14.7	8.4	27.6		8.1	72.8	72.8	6.1	70.8	70.8
70th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Gap	Gap	Gap	Gap	Hold	Hold
50th %ile Green (s)	26.7	26.7	26.7	7.2	38.4		8.1	72.6	72.6	0.0	60.0	60.0
50th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Gap	Gap	Gap	Skip	Hold	Hold
30th %ile Green (s)	40.9	40.9	40.9	0.0	40.9		7.4	70.1	70.1	0.0	58.2	58.2
30th %ile Term Code	Coord	Coord	Coord	Skip	Coord		Gap	Gap	Gap	Skip	Hold	Hold
10th %ile Green (s)	47.3	47.3	47.3	0.0	47.3		6.3	63.7	63.7	0.0	52.9	52.9
10th %ile Term Code	Coord	Coord	Coord	Skip	Coord		Gap	Gap	Gap	Skip	Hold	Hold
Queue Length 50th (ft)		11	0	20	34		5	47	0	6	111	0
Queue Length 95th (ft)		21	0	41	91		m3	m47	m0	5	85	0
Internal Link Dist (ft)		537			806			1649			1270	
Turn Bay Length (ft)							150			150		250
Base Capacity (vph)		424	473	370	556		556	1868	1019	194	1852	1011
Starvation Cap Reductn		0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio		0.04	0.02	0.10	0.15		0.17	0.79	0.03	0.10	0.26	0.03

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 112 (93%), Referenced to phase 2:NWTL and 6:SETL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 10.7

Intersection LOS: B




Intersection Capacity Utilization 57.6%

ICU Level of Service B

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.







Splits and Phases: 250: Old Gordon Rd.

 Ø2 (L)	 Ø3	 Ø4
33 s	9.5 s	77.5 s
 Ø5	 Ø7	 Ø8
9.6 s	9.8 s	77.2 s

Synchro Report - Signalized Intersections
270: Fulton Ind. Blvd & UPS Drive

Future 2031 - AM
06/27/2021



Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	102	102	200	800	350	0
Future Volume (vph)	102	102	200	800	350	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	0.850					
Flt Protected	0.950	0.950				
Satd. Flow (prot)	902	808	950	3008	3008	1863
Flt Permitted	0.950	0.408				
Satd. Flow (perm)	902	808	408	3008	3008	1863
Right Turn on Red	Yes					Yes
Satd. Flow (RTOR)	129					
Link Speed (mph)	30	30			30	
Link Distance (ft)	912	1889			1254	
Travel Time (s)	20.7	42.9			28.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	100%	100%	90%	20%	20%	2%
Adj. Flow (vph)	129	129	252	1009	441	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	129	129	252	1009	441	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12	12			12	
Link Offset(ft)	0	0			0	
Crosswalk Width(ft)	16	16			16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9		
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4	5		2	6	
Permitted Phases	4		2	6		
Detector Phase	4	4	5	2	6	6



Lane Group	SEL	SER	NEL	NET	SWT	SWR
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	26.0	51.0	25.0	25.0
Total Split (%)	32.0%	32.0%	34.7%	68.0%	33.3%	33.3%
Maximum Green (s)	19.5	19.5	21.5	46.5	20.5	20.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effect Green (s)	15.0	15.0	51.0	51.0	31.6	
Actuated g/C Ratio	0.20	0.20	0.68	0.68	0.42	
v/c Ratio	0.72	0.49	0.65	0.49	0.35	
Control Delay	49.2	11.5	14.4	7.4	18.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	49.2	11.5	14.4	7.4	18.4	
LOS	D	B	B	A	B	
Approach Delay	30.4			8.8	18.4	
Approach LOS	C			A	B	
90th %ile Green (s)	19.5	19.5	21.5	46.5	20.5	20.5
90th %ile Term Code	Max	Max	Max	Coord	Coord	Coord
70th %ile Green (s)	19.1	19.1	19.3	46.9	23.1	23.1
70th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
50th %ile Green (s)	15.9	15.9	14.7	50.1	30.9	30.9
50th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
30th %ile Green (s)	12.6	12.6	11.2	53.4	37.7	37.7
30th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
10th %ile Green (s)	7.7	7.7	7.9	58.3	45.9	45.9
10th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
Queue Length 50th (ft)	56	0	45	104	72	
Queue Length 95th (ft)	108	42	103	172	136	
Internal Link Dist (ft)	832			1809	1174	
Turn Bay Length (ft)						
Base Capacity (vph)	234	305	432	2047	1268	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.55	0.42	0.58	0.49	0.35	

Intersection Summary

Area Type: Other
Cycle Length: 75

Synchro Report - Signalized Intersections
 270: Fulton Ind. Blvd & UPS Drive

Future 2031 - AM
 06/27/2021

Actuated Cycle Length: 75

Offset: 64 (85%), Referenced to phase 2:NETL and 6:SWT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 13.8

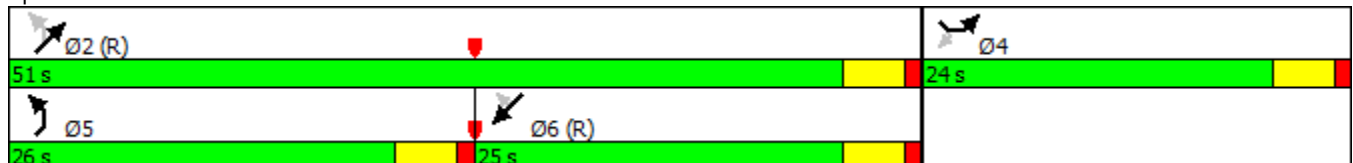
Intersection LOS: B

Intersection Capacity Utilization 41.9%

ICU Level of Service A













Analysis Period (min) 15

Splits and Phases: 270: Fulton Ind. Blvd & UPS Drive



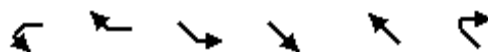
Synchro Report - Signalized Intersections
280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy

Future 2031 - AM
06/27/2021

						
Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	45	0	99	1533	741	0
Future Volume (vph)	45	0	99	1533	741	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	300			0
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Fr						
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1863	1570	3139	3139	1652
Flt Permitted	0.950		0.270			
Satd. Flow (perm)	1770	1863	446	3139	3139	1652
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	1300			1130	416	
Travel Time (s)	29.5			25.7	9.5	
Peak Hour Factor	0.72	0.72	0.92	0.92	0.92	0.92
Growth Factor	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	2%	2%	15%	15%	15%	15%
Adj. Flow (vph)	73	0	125	1933	934	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	73	0	125	1933	934	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm

Synchro Report - Signalized Intersections
280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy

Future 2031 - AM
06/27/2021



Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Protected Phases	8		1	6	2	
Permitted Phases		8	6			2
Detector Phase	8	8	1	6	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	12.0	97.5	85.5	85.5
Total Split (%)	18.8%	18.8%	10.0%	81.3%	71.3%	71.3%
Maximum Green (s)	18.0	18.0	7.5	93.0	81.0	81.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effect Green (s)	10.3		102.9	103.8	91.2	
Actuated g/C Ratio	0.09		0.86	0.86	0.76	
v/c Ratio	0.48		0.28	0.71	0.39	
Control Delay	62.2		3.4	6.0	2.9	
Queue Delay	0.4		0.0	0.5	0.1	
Total Delay	62.6		3.4	6.5	3.0	
LOS	E		A	A	A	
Approach Delay	62.6			6.3	3.0	
Approach LOS	E			A	A	
90th %ile Green (s)	14.3	14.3	8.9	96.7	83.3	83.3
90th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
70th %ile Green (s)	12.0	12.0	7.8	99.0	86.7	86.7
70th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
50th %ile Green (s)	10.3	10.3	7.1	100.7	89.1	89.1
50th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
30th %ile Green (s)	8.6	8.6	6.6	102.4	91.3	91.3
30th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
10th %ile Green (s)	0.0	0.0	5.6	115.5	105.4	105.4
10th %ile Term Code	Skip	Skip	Gap	Coord	Coord	Coord
Queue Length 50th (ft)	55		13	244	60	
Queue Length 95th (ft)	80		28	399	12	
Internal Link Dist (ft)	1220			1050	336	
Turn Bay Length (ft)			300			
Base Capacity (vph)	265		455	2714	2384	
Starvation Cap Reductn	0		0	0	280	
Spillback Cap Reductn	44		0	360	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.33		0.27	0.82	0.44	

Synchro Report - Signalized Intersections
 280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy

Future 2031 - AM
 06/27/2021

Intersection Summary






















Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 62 (52%), Referenced to phase 2:NWT and 6:SETL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 6.7 Intersection LOS: A
 Intersection Capacity Utilization 60.8% ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy















Synchro Report - Signalized Intersections
290: Fulton Ind. Blvd & Donald Lee Hollowell Pkwy

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	176	1568	200	88	728	0	60	311	0	49	52	50
Future Volume (vph)	176	1568	200	88	728	0	60	311	0	49	52	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	300		0	300		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850								0.930	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1570	3139	1404	1570	3139	0	1504	3008	0	1570	2919	0
Flt Permitted	0.242			0.059			0.635			0.253		
Satd. Flow (perm)	400	3139	1404	97	3139	0	1005	3008	0	418	2919	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			214								74	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		416			899			1051			1138	
Travel Time (s)		9.5			20.4			23.9			25.9	
Peak Hour Factor	0.80	0.95	0.92	0.92	0.96	0.92	0.83	0.90	0.92	0.72	0.72	0.78
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	15%	15%	15%	15%	15%	15%	20%	20%	20%	15%	15%	15%
Adj. Flow (vph)	255	1915	252	111	880	0	84	401	0	79	84	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	255	1915	252	111	880	0	84	401	0	79	158	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	

Synchro Report - Signalized Intersections
290: Fulton Ind. Blvd & Donald Lee Hollowell Pkwy









Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2			4			8		
Detector Phase	1	6	6	5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.6	78.2	78.2	9.8	63.4		9.5	22.5		9.5	22.5	
Total Split (%)	20.5%	65.2%	65.2%	8.2%	52.8%		7.9%	18.8%		7.9%	18.8%	
Maximum Green (s)	20.1	73.7	73.7	5.3	58.9		5.0	18.0		5.0	18.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)		11.0	11.0		11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effect Green (s)	84.6	75.2	75.2	74.5	68.5		21.8	17.8		21.8	17.8	
Actuated g/C Ratio	0.70	0.63	0.63	0.62	0.57		0.18	0.15		0.18	0.15	
v/c Ratio	0.63	0.97	0.26	0.83	0.49		0.41	0.90		0.64	0.32	
Control Delay	13.7	33.5	2.4	71.9	11.2		46.4	74.4		63.5	26.0	
Queue Delay	0.1	14.9	0.4	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	13.8	48.4	2.8	71.9	11.2		46.4	74.4		63.5	26.0	
LOS	B	D	A	E	B		D	E		E	C	
Approach Delay		40.0			18.0			69.5			38.5	
Approach LOS		D			B			E			D	
90th %ile Green (s)	17.3	73.7	73.7	5.3	61.7		5.0	18.0		5.0	18.0	
90th %ile Term Code	Gap	Coord	Coord	Max	Coord		Max	Max		Max	Hold	
70th %ile Green (s)	14.1	73.7	73.7	5.3	64.9		5.0	18.0		5.0	18.0	
70th %ile Term Code	Gap	Coord	Coord	Max	Coord		Max	Max		Max	Hold	
50th %ile Green (s)	12.5	73.7	73.7	5.3	66.5		5.0	18.0		5.0	18.0	
50th %ile Term Code	Gap	Coord	Coord	Max	Coord		Max	Max		Max	Hold	
30th %ile Green (s)	11.1	73.7	73.7	5.3	67.9		5.0	18.0		5.0	18.0	
30th %ile Term Code	Gap	Coord	Coord	Max	Coord		Max	Max		Max	Hold	
10th %ile Green (s)	8.0	81.0	81.0	8.6	81.6		0.0	16.9		0.0	16.9	
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Skip	Gap		Skip	Hold	
Queue Length 50th (ft)	42	733	12	47	93		53	162		50	30	
Queue Length 95th (ft)	90	#941	m34	#165	253		92	#252		74	44	
Internal Link Dist (ft)		336			819			971			1058	
Turn Bay Length (ft)	200		200	300			300			200		
Base Capacity (vph)	481	1965	959	133	1792		203	451		124	500	
Starvation Cap Reductn	8	113	348	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.54	1.03	0.41	0.83	0.49		0.41	0.89		0.64	0.32	

Intersection Summary



















Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 54 (45%), Referenced to phase 2:NWTL and 6:SETL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 38.1 Intersection LOS: D
 Intersection Capacity Utilization 85.1% ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 290: Fulton Ind. Blvd & Donald Lee Hollowell Pkwy

 Ø1	 Ø2 (R)	 Ø3	 Ø4
24.6 s	63.4 s	9.5 s	22.5 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
9.8 s	78.2 s	9.5 s	22.5 s













Synchro Report - Signalized Intersections
300: Bolton Rd & Donald Lee Hollowell Pkwy

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	8	1234	31	38	1038	14	13	31	62	18	14	12
Future Volume (vph)	8	1234	31	38	1038	14	13	31	62	18	14	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.998			0.921			0.964	
Flt Protected	0.950			0.950				0.994			0.980	
Satd. Flow (prot)	1444	3082	0	1719	3191	0	0	1696	0	0	1699	0
Flt Permitted	0.163			0.131				0.963			0.571	
Satd. Flow (perm)	248	3082	0	237	3191	0	0	1643	0	0	990	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			2			50			13	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		899			304			783			722	
Travel Time (s)		20.4			6.9			17.8			16.4	
Peak Hour Factor	0.98	0.98	0.98	0.85	0.85	0.85	0.93	0.93	0.93	0.72	0.72	0.72
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	25%	17%	3%	5%	13%	7%	2%	2%	3%	11%	2%	2%
Adj. Flow (vph)	9	1461	37	52	1417	19	16	39	77	29	23	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	1498	0	52	1436	0	0	132	0	0	71	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	

Synchro Report - Signalized Intersections
300: Bolton Rd & Donald Lee Hollowell Pkwy

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	10.0	85.0		11.0	86.0		24.0	24.0		24.0	24.0	
Total Split (%)	8.3%	70.8%		9.2%	71.7%		20.0%	20.0%		20.0%	20.0%	
Maximum Green (s)	5.5	80.5		6.5	81.5		19.5	19.5		19.5	19.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	95.4	90.8		98.8	97.4			11.5			11.5	
Actuated g/C Ratio	0.80	0.76		0.82	0.81			0.10			0.10	
v/c Ratio	0.04	0.64		0.19	0.55			0.65			0.67	
Control Delay	1.4	5.0		3.3	6.6			46.5			70.5	
Queue Delay	0.0	0.4		0.0	0.4			0.9			1.5	
Total Delay	1.4	5.4		3.3	7.0			47.5			72.0	
LOS	A	A		A	A			D			E	
Approach Delay		5.3			6.9			47.5			72.0	
Approach LOS		A			A			D			E	
90th %ile Green (s)	6.0	81.9		7.1	83.0		17.5	17.5		17.5	17.5	
90th %ile Term Code	Gap	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
70th %ile Green (s)	0.0	86.1		6.5	97.1		13.9	13.9		13.9	13.9	
70th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	0.0	88.9		6.1	99.5		11.5	11.5		11.5	11.5	
50th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	0.0	91.6		5.8	101.9		9.1	9.1		9.1	9.1	
30th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	0.0	105.5		0.0	105.5		5.5	5.5		5.5	5.5	
10th %ile Term Code	Skip	Coord		Skip	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)	1	160		2	25			61			44	
Queue Length 95th (ft)	m1	m9		m12	m526			122			69	
Internal Link Dist (ft)		819			224			703			642	
Turn Bay Length (ft)	400			150								
Base Capacity (vph)	253	2333		276	2590			308			171	
Starvation Cap Reductn	0	0		0	565			0			0	
Spillback Cap Reductn	0	323		0	0			53			29	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.04	0.75		0.19	0.71			0.52			0.50	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 68 (57%), Referenced to phase 2:NWTL and 6:SETL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 9.3

Intersection LOS: A







Intersection Capacity Utilization 55.6%

ICU Level of Service B

Analysis Period (min) 15

















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 300: Bolton Rd & Donald Lee Hollowell Pkwy

 Ø1	 Ø2 (R)	 Ø4
10 s	86 s	24 s
 Ø5	 Ø6 (R)	 Ø8
11 s	85 s	24 s












Synchro Report - Signalized Intersections
310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp

Future 2031 - AM
06/27/2021

											
Lane Group	NBL	NBR	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR
Lane Configurations											
Traffic Volume (vph)	0	0	0	843	526	158	636	0	76	0	419
Future Volume (vph)	0	0	0	843	526	158	636	0	76	0	419
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00
Fr't				0.942							0.850
Flt Protected						0.950			0.950		
Satd. Flow (prot)	0	0	0	3012	0	1262	3252	0	2736	0	1417
Flt Permitted						0.061			0.950		
Satd. Flow (perm)	0	0	0	3012	0	81	3252	0	2736	0	1417
Right Turn on Red					Yes			Yes			Yes
Satd. Flow (RTOR)				165							240
Link Speed (mph)	30			30			30			30	
Link Distance (ft)	922			304			568			593	
Travel Time (s)	21.0			6.9			12.9			13.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.87	0.87	0.87
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	2%	2%	2%	11%	16%	43%	11%	2%	28%	2%	14%
Adj. Flow (vph)	0	0	0	1063	663	191	769	0	101	0	559
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	0	1726	0	191	769	0	101	0	559
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			24			24			24	
Link Offset(ft)	0			0			0			0	
Crosswalk Width(ft)	16			16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15		9	15		9	15	15	9
Number of Detectors				2		1	2		1		1
Detector Template				Thru		Left	Thru		Left		Right
Leading Detector (ft)				100		20	100		20		20
Trailing Detector (ft)				0		0	0		0		0
Detector 1 Position(ft)				0		0	0		0		0
Detector 1 Size(ft)				6		20	6		20		20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)				0.0		0.0	0.0		0.0		0.0
Detector 1 Queue (s)				0.0		0.0	0.0		0.0		0.0
Detector 1 Delay (s)				0.0		0.0	0.0		0.0		0.0
Detector 2 Position(ft)				94			94				
Detector 2 Size(ft)				6			6				
Detector 2 Type				Cl+Ex			Cl+Ex				
Detector 2 Channel											
Detector 2 Extend (s)				0.0			0.0				
Turn Type				NA		pm+pt	NA		Prot		Perm
Protected Phases				6		5	2		3		
Permitted Phases						2					8
Detector Phase				6		5	2		3		8

Synchro Report - Signalized Intersections
310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp

Future 2031 - AM
06/27/2021

											
Lane Group	NBL	NBR	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR
Switch Phase											
Minimum Initial (s)				5.0		5.0	5.0		5.0		5.0
Minimum Split (s)				22.5		9.5	22.5		9.5		22.5
Total Split (s)				65.6		18.4	84.0		36.0		36.0
Total Split (%)				54.7%		15.3%	70.0%		30.0%		30.0%
Maximum Green (s)				61.1		13.9	79.5		31.5		31.5
Yellow Time (s)				3.5		3.5	3.5		3.5		3.5
All-Red Time (s)				1.0		1.0	1.0		1.0		1.0
Lost Time Adjust (s)				0.0		0.0	0.0		0.0		0.0
Total Lost Time (s)				4.5		4.5	4.5		4.5		4.5
Lead/Lag				Lag		Lead					
Lead-Lag Optimize?				Yes		Yes					
Vehicle Extension (s)				3.0		3.0	3.0		3.0		3.0
Recall Mode				C-Min		None	C-Min		None		None
Walk Time (s)				7.0			7.0				7.0
Flash Dont Walk (s)				11.0			11.0				11.0
Pedestrian Calls (#/hr)				0			0				0
Act Effect Green (s)				61.1		79.5	79.5		31.5		31.5
Actuated g/C Ratio				0.51		0.66	0.66		0.26		0.26
v/c Ratio				1.07		1.01	0.36		0.14		1.02
Control Delay				60.1		99.7	6.9		34.6		69.2
Queue Delay				0.5		0.0	0.0		0.0		9.9
Total Delay				60.7		99.7	7.0		34.6		79.1
LOS				E		F	A		C		E
Approach Delay				60.7			25.4			72.3	
Approach LOS				E			C			E	
90th %ile Green (s)				61.1		13.9	79.5		31.5		31.5
90th %ile Term Code				Coord		Max	Coord		Hold		Max
70th %ile Green (s)				61.1		13.9	79.5		31.5		31.5
70th %ile Term Code				Coord		Max	Coord		Hold		Max
50th %ile Green (s)				61.1		13.9	79.5		31.5		31.5
50th %ile Term Code				Coord		Max	Coord		Hold		Max
30th %ile Green (s)				61.1		13.9	79.5		31.5		31.5
30th %ile Term Code				Coord		Max	Coord		Hold		Max
10th %ile Green (s)				61.1		13.9	79.5		31.5		31.5
10th %ile Term Code				Coord		Max	Coord		Hold		Max
Queue Length 50th (ft)				~736		~123	143		30		~311
Queue Length 95th (ft)				#871		m#237	127		52		#497
Internal Link Dist (ft)	842			224			488			513	
Turn Bay Length (ft)											
Base Capacity (vph)				1614		190	2154		718		548
Starvation Cap Reductn				2		0	0		0		0
Spillback Cap Reductn				0		0	228		0		16
Storage Cap Reductn				0		0	0		0		0
Reduced v/c Ratio				1.07		1.01	0.40		0.14		1.05
Intersection Summary											
Area Type:	Other										
Cycle Length: 120											

Synchro Report - Signalized Intersections
 310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp

Future 2031 - AM
 06/27/2021

Actuated Cycle Length: 120

Offset: 62 (52%), Referenced to phase 2:NWTL and 6:SET, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 52.9

Intersection LOS: D

Intersection Capacity Utilization 64.2%

ICU Level of Service C

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

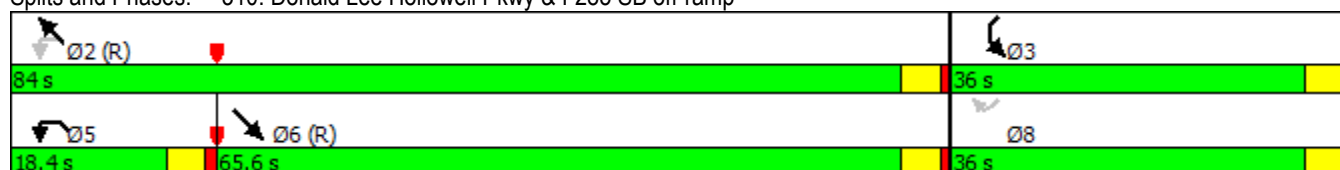
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp














Synchro Report - Signalized Intersections
320: I-285 NB off-ramp & Donald Lee Hollowell Pkwy

Future 2031 - AM
06/27/2021

											
Lane Group	SBL	SBR	SEL	SET	SER	NWL	NWT	NWR	NEL2	NEL	NER
Lane Configurations											
Traffic Volume (vph)	0	0	443	477	0	0	352	133	451	0	206
Future Volume (vph)	0	0	443	477	0	0	352	133	451	0	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	300		0	0		0		0	0
Storage Lanes	0	0	1		0	0		0		2	1
Taper Length (ft)	25		25			25				25	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt							0.959				0.850
Flt Protected			0.950						0.950		
Satd. Flow (prot)	0	0	1504	3167	0	0	3874	0	3127	0	1335
Flt Permitted			0.280						0.950		
Satd. Flow (perm)	0	0	443	3167	0	0	3874	0	3127	0	1335
Right Turn on Red					Yes			Yes			Yes
Satd. Flow (RTOR)							74				347
Link Speed (mph)	30			30			30			30	
Link Distance (ft)	782			568			1114			887	
Travel Time (s)	17.8			12.9			25.3			20.2	
Peak Hour Factor	0.92	0.92	0.90	0.90	0.90	0.83	0.83	0.83	0.94	0.94	0.94
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	2%	2%	20%	14%	2%	2%	24%	40%	12%	2%	21%
Adj. Flow (vph)	0	0	571	615	0	0	492	186	557	0	254
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	571	615	0	0	678	0	557	0	254
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			12			12			24	
Link Offset(ft)	0			0			0			0	
Crosswalk Width(ft)	16			16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15		9	15		9	15	15	9
Number of Detectors			1	2			2		1		1
Detector Template			Left	Thru			Thru		Left		Right
Leading Detector (ft)			20	100			100		20		20
Trailing Detector (ft)			0	0			0		0		0
Detector 1 Position(ft)			0	0			0		0		0
Detector 1 Size(ft)			20	6			6		20		20
Detector 1 Type			Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex		Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)			0.0	0.0			0.0		0.0		0.0
Detector 1 Queue (s)			0.0	0.0			0.0		0.0		0.0
Detector 1 Delay (s)			0.0	0.0			0.0		0.0		0.0
Detector 2 Position(ft)				94			94				
Detector 2 Size(ft)				6			6				
Detector 2 Type				Cl+Ex			Cl+Ex				
Detector 2 Channel											
Detector 2 Extend (s)				0.0			0.0				
Turn Type			pm+pt	NA			NA		Prot		Perm

Synchro Report - Signalized Intersections
320: I-285 NB off-ramp & Donald Lee Hollowell Pkwy

Future 2031 - AM
06/27/2021

											
Lane Group	SBL	SBR	SEL	SET	SER	NWL	NWT	NWR	NEL2	NEL	NER
Protected Phases			5	2			6		3		
Permitted Phases			2								3
Detector Phase			5	2			6		3		3
Switch Phase											
Minimum Initial (s)			5.0	5.0			5.0		5.0		5.0
Minimum Split (s)			9.5	22.5			22.5		9.5		9.5
Total Split (s)			56.0	88.0			32.0		32.0		32.0
Total Split (%)			46.7%	73.3%			26.7%		26.7%		26.7%
Maximum Green (s)			51.5	83.5			27.5		27.5		27.5
Yellow Time (s)			3.5	3.5			3.5		3.5		3.5
All-Red Time (s)			1.0	1.0			1.0		1.0		1.0
Lost Time Adjust (s)			0.0	0.0			0.0		0.0		0.0
Total Lost Time (s)			4.5	4.5			4.5		4.5		4.5
Lead/Lag			Lead				Lag				
Lead-Lag Optimize?			Yes				Yes				
Vehicle Extension (s)			3.0	3.0			3.0		3.0		3.0
Recall Mode			Min	C-Min			C-Min		None		None
Walk Time (s)				7.0			7.0				
Flash Dont Walk (s)				11.0			11.0				
Pedestrian Calls (#/hr)				0			0				
Act Effect Green (s)			85.6	85.6			42.0		25.4		25.4
Actuated g/C Ratio			0.71	0.71			0.35		0.21		0.21
v/c Ratio			0.86	0.27			0.48		0.84		0.46
Control Delay			14.2	1.3			31.2		57.5		3.2
Queue Delay			0.4	0.0			0.0		0.0		0.0
Total Delay			14.6	1.3			31.2		57.5		3.2
LOS			B	A			C		E		A
Approach Delay				7.7			31.2			40.5	
Approach LOS				A			C			D	
90th %ile Green (s)			51.5	83.5			27.5		27.5		27.5
90th %ile Term Code			Max	Coord			Coord		Max		Max
70th %ile Green (s)			47.8	82.8			30.5		28.2		28.2
70th %ile Term Code			Gap	Coord			Coord		Max		Max
50th %ile Green (s)			41.0	83.8			38.3		27.2		27.2
50th %ile Term Code			Gap	Coord			Coord		Gap		Gap
30th %ile Green (s)			33.2	87.0			49.3		24.0		24.0
30th %ile Term Code			Gap	Coord			Coord		Gap		Gap
10th %ile Green (s)			21.8	90.7			64.4		20.3		20.3
10th %ile Term Code			Gap	Coord			Coord		Gap		Gap
Queue Length 50th (ft)			82	10			139		210		0
Queue Length 95th (ft)			m58	m18			186		275		7
Internal Link Dist (ft)	702			488			1034			807	
Turn Bay Length (ft)			300								
Base Capacity (vph)			771	2261			1403		720		574
Starvation Cap Reductn			30	0			0		0		0
Spillback Cap Reductn			0	0			0		0		0
Storage Cap Reductn			0	0			0		0		0
Reduced v/c Ratio			0.77	0.27			0.48		0.77		0.44

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 18 (15%), Referenced to phase 2:SETL and 6:NWT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 23.6

Intersection LOS: C

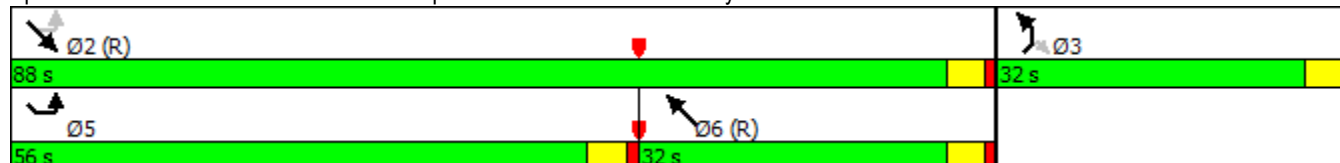
Intersection Capacity Utilization 64.2%

ICU Level of Service C

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 320: I-285 NB off-ramp & Donald Lee Hollowell Pkwy


























2031 PM Synchro Analysis Report

Synchro Report - Signalized Intersections
 10: Cascade Palmetto Hwy/Fulton Ind. Blvd. & Campbellton Rd.













Future - 2031 PM

06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	165	332	92	89	465	18	96	301	90	93	621	535
Future Volume (vph)	165	332	92	89	465	18	96	301	90	93	621	535
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	300		0	400		400	300		300
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.994				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1810	1482	1752	1761	0	1805	3438	1568	1327	2983	1468
Flt Permitted	0.111			0.324			0.223			0.407		
Satd. Flow (perm)	205	1810	1482	598	1761	0	424	3438	1568	569	2983	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			116		2				115			276
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		808			851			3037			3592	
Travel Time (s)		18.4			19.3			69.0			81.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	3%	5%	9%	3%	7%	13%	0%	5%	3%	36%	21%	10%
Adj. Flow (vph)	208	419	116	112	586	23	121	380	113	117	783	675
Shared Lane Traffic (%)												
Lane Group Flow (vph)	208	419	116	112	609	0	121	380	113	117	783	675
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm

Synchro Report - Signalized Intersections
10: Cascade Palmetto Hwy/Fulton Ind. Blvd. & Campbellton Rd.

Future - 2031 PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	13.6	40.3	40.3	11.3	38.0		9.6	34.8	34.8	13.6	38.8	38.8
Total Split (%)	13.6%	40.3%	40.3%	11.3%	38.0%		9.6%	34.8%	34.8%	13.6%	38.8%	38.8%
Maximum Green (s)	9.1	35.8	35.8	6.8	33.5		5.1	30.3	30.3	9.1	34.3	34.3
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes				Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effect Green (s)	45.0	35.9	35.9	40.2	33.5		35.8	30.7	30.7	43.0	34.3	34.3
Actuated g/C Ratio	0.45	0.36	0.36	0.40	0.34		0.36	0.31	0.31	0.43	0.34	0.34
v/c Ratio	0.90	0.65	0.19	0.35	1.03		0.55	0.36	0.20	0.38	0.77	0.99
Control Delay	60.5	32.4	5.1	18.6	79.1		28.4	28.3	5.8	21.2	35.2	52.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.5	32.4	5.1	18.6	79.1		28.4	28.3	5.8	21.2	35.2	52.1
LOS	E	C	A	B	E		C	C	A	C	D	D
Approach Delay		36.0			69.7			24.2			41.4	
Approach LOS		D			E			C			D	
90th %ile Green (s)	9.1	35.8	35.8	6.8	33.5		5.1	30.3	30.3	9.1	34.3	34.3
90th %ile Term Code	Max	Max	Max	Max	Max		Max	Hold	Hold	Max	Max	Max
70th %ile Green (s)	9.1	35.8	35.8	6.8	33.5		5.1	30.3	30.3	9.1	34.3	34.3
70th %ile Term Code	Max	Hold	Hold	Max	Max		Max	Hold	Hold	Max	Max	Max
50th %ile Green (s)	9.1	35.8	35.8	6.8	33.5		5.1	30.3	30.3	9.1	34.3	34.3
50th %ile Term Code	Max	Hold	Hold	Max	Max		Max	Hold	Hold	Max	Max	Max
30th %ile Green (s)	9.1	35.8	35.8	6.8	33.5		5.1	30.3	30.3	9.1	34.3	34.3
30th %ile Term Code	Max	Hold	Hold	Max	Max		Max	Hold	Hold	Max	Max	Max
10th %ile Green (s)	9.1	36.2	36.2	6.4	33.5		5.1	32.5	32.5	6.9	34.3	34.3
10th %ile Term Code	Max	Hold	Hold	Gap	Max		Max	Hold	Hold	Gap	Max	Max
Queue Length 50th (ft)	81	220	0	39	~418		45	99	0	45	231	285
Queue Length 95th (ft)	#216	327	36	71	#634		81	141	38	83	305	#539
Internal Link Dist (ft)		728			771			2957			3512	
Turn Bay Length (ft)	300		300	300			400		400	300		300
Base Capacity (vph)	232	649	606	319	591		222	1056	561	315	1023	684
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.65	0.19	0.35	1.03		0.55	0.36	0.20	0.37	0.77	0.99

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.03

Intersection Signal Delay: 43.0

Intersection LOS: D

Intersection Capacity Utilization 85.5%

ICU Level of Service E

Analysis Period (min) 15

90th %ile Actuated Cycle: 100

70th %ile Actuated Cycle: 100

50th %ile Actuated Cycle: 100

30th %ile Actuated Cycle: 100

10th %ile Actuated Cycle: 100









~ Volume exceeds capacity, queue is theoretically infinite.








Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 10: Cascade Palmetto Hwy/Fulton Ind. Blvd. & Campbellton Rd.

 Ø1	 Ø2	 Ø3	 Ø4
13.6 s	34.8 s	11.3 s	40.3 s
 Ø5	 Ø6	 Ø7	 Ø8
9.6 s	38.8 s	13.6 s	38 s








Intersection							
Int Delay, s/veh	107.1						
Movement	SEL	SER	NEL	NET	SWU	SWT	SWR
Lane Configurations							
Traffic Vol, veh/h	79	70	16	487	16	1246	39
Future Vol, veh/h	79	70	16	487	16	1246	39
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	-	Yield
Storage Length	0	100	150	-	150	-	150
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	68	68	92	92	74	74	74
Heavy Vehicles, %	10	17	13	13	6	3	28
Mvmt Flow	135	119	20	614	25	1953	61

Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	2350	977	1953	0	448	-	0
Stage 1	2003	-	-	-	-	-	-
Stage 2	347	-	-	-	-	-	-
Critical Hdwy	7	7.24	4.36	-	6.52	-	-
Critical Hdwy Stg 1	6	-	-	-	-	-	-
Critical Hdwy Stg 2	6	-	-	-	-	-	-
Follow-up Hdwy	3.6	3.47	2.33	-	2.56	-	-
Pot Cap-1 Maneuver	~ 27	224	256	-	730	-	-
Stage 1	~ 82	-	-	-	-	-	-
Stage 2	664	-	-	-	-	-	-
Platoon blocked, %				-	-	-	-
Mov Cap-1 Maneuver	~ 25	224	256	-	730	-	-
Mov Cap-2 Maneuver	~ 25	-	-	-	-	-	-
Stage 1	~ 82	-	-	-	-	-	-
Stage 2	612	-	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s \$	1231	0.6	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SELn2	SWU	SWT	SWR
Capacity (veh/h)	256	-	25	224	730	-	-
HCM Lane V/C Ratio	0.079	-	5.391	0.533	0.034	-	-
HCM Control Delay (s)	20.3	\$ 2288.1	38	10.1	-	-	-
HCM Lane LOS	C	-	F	E	B	-	-
HCM 95th %tile Q(veh)	0.3	-	16.7	2.8	0.1	-	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection							
Int Delay, s/veh	90.4						
Movement	SEL	SER	NEL	NET	SWU	SWT	SWR
Lane Configurations							
Traffic Vol, veh/h	71	73	10	484	4	1369	76
Future Vol, veh/h	71	73	10	484	4	1369	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	-	None
Storage Length	0	100	150	-	150	-	150
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	58	58	85	85	93	93	93
Heavy Vehicles, %	28	10	10	16	25	5	50
Mvmt Flow	142	146	14	661	5	1708	95

Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	2076	854	1708	0	482	-	0
Stage 1	1718	-	-	-	-	-	-
Stage 2	358	-	-	-	-	-	-
Critical Hdwy	7.36	7.1	4.3	-	6.9	-	-
Critical Hdwy Stg 1	6.36	-	-	-	-	-	-
Critical Hdwy Stg 2	6.36	-	-	-	-	-	-
Follow-up Hdwy	3.78	3.4	2.3	-	2.75	-	-
Pot Cap-1 Maneuver	~ 34	286	334	-	621	-	-
Stage 1	~ 99	-	-	-	-	-	-
Stage 2	607	-	-	-	-	-	-
Platoon blocked, %				-	-	-	-
Mov Cap-1 Maneuver	~ 33	286	334	-	621	-	-
Mov Cap-2 Maneuver	~ 33	-	-	-	-	-	-
Stage 1	~ 99	-	-	-	-	-	-
Stage 2	582	-	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	868.7	0.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SELn2	SWU	SWT	SWR
Capacity (veh/h)	334	-	33	286	621	-	-
HCM Lane V/C Ratio	0.041	-	4.303	0.51	0.008	-	-
HCM Control Delay (s)	16.2	\$	1731.1	30	10.8	-	-
HCM Lane LOS	C	-	F	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	16.8	2.7	0	-	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection												
Int Delay, s/veh	258											
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↔	↔		↔		↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	50	44	131	58	14	54	19	590	70	60	1086	38
Future Vol, veh/h	50	44	131	58	14	54	19	590	70	60	1086	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	300	-	200	300	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	91	91	91	86	86	86	89	89	89
Heavy Vehicles, %	26	0	13	7	7	4	42	12	1	2	8	40
Mvmt Flow	74	65	195	74	18	69	26	796	94	78	1415	50

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2030	2419	708	1744	2419	398	1415	0	0	796	0	0
Stage 1	1572	1572	-	847	847	-	-	-	-	-	-	-
Stage 2	458	847	-	897	1572	-	-	-	-	-	-	-
Critical Hdwy	8.02	6.5	7.16	7.64	6.64	6.98	4.94	-	-	4.14	-	-
Critical Hdwy Stg 1	7.02	5.5	-	6.64	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.02	5.5	-	6.64	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.76	4	3.43	3.57	4.07	3.34	2.62	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 25	~ 33	353	~ 52	30	596	316	-	-	822	-	-
Stage 1	91	172	-	313	365	-	-	-	-	-	-	-
Stage 2	493	381	-	291	161	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 8	~ 27	353	-	25	596	316	-	-	822	-	-
Mov Cap-2 Maneuver	~ 8	~ 27	-	-	25	-	-	-	-	-	-	-
Stage 1	84	156	-	287	335	-	-	-	-	-	-	-
Stage 2	379	350	-	~ 69	146	-	-	-	-	-	-	-





















Approach	SE	NW	NE	SW
HCM Control Delay, \$ 2274.1			0.5	0.5
HCM LOS	F	-		

Minor Lane/Major Mvmt	NEL	NET	NERNWLn1	SELn1	SELn2	SWL	SWT	SWR
Capacity (veh/h)	316	-	-	-	12	353	822	-
HCM Lane V/C Ratio	0.081	-	-	-	11.65	0.552	0.095	-
HCM Control Delay (s)	17.4	-	-	\$ 5405.6	27.1	9.8	-	-
HCM Lane LOS	C	-	-	F	D	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-	18.8	3.2	0.3	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon


Synchro Report - Signalized Intersections
60: Fulton Ind. Blvd. & Boat Rock Blvd./Boat Rock Rd.

Future - 2031 PM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	50	50	50	42	50	100	679	50	126	957	100
Future Volume (vph)	100	50	50	50	42	50	100	679	50	126	957	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	300		150
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.925			0.952			0.990				0.850
Flt Protected	0.950				0.983		0.950			0.950		
Satd. Flow (prot)	1128	1098	0	0	1482	0	1128	2978	0	1504	3008	897
Flt Permitted	0.478				0.836		0.116			0.214		
Satd. Flow (perm)	568	1098	0	0	1260	0	138	2978	0	339	3008	897
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		58			27			11				127
Link Speed (mph)		30			30			30				30
Link Distance (ft)		812			1105			708			889	
Travel Time (s)		18.5			25.1			16.1			20.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	60%	60%	60%	20%	20%	20%	60%	20%	20%	20%	20%	80%
Adj. Flow (vph)	126	63	63	63	53	63	126	856	63	159	1207	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	126	126	0	0	179	0	126	919	0	159	1207	126
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm

Synchro Report - Signalized Intersections
60: Fulton Ind. Blvd. & Boat Rock Blvd./Boat Rock Rd.

Future - 2031 PM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	22.5
Total Split (s)	10.0	32.5		22.5	22.5		12.0	44.9		12.6	45.5	45.5
Total Split (%)	11.1%	36.1%		25.0%	25.0%		13.3%	49.9%		14.0%	50.6%	50.6%
Maximum Green (s)	5.5	28.0		18.0	18.0		7.5	40.4		8.1	41.0	41.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Min		Min	Min		None	Min		None	Min	Min
Walk Time (s)		7.0		7.0	7.0			7.0			7.0	7.0
Flash Dont Walk (s)		11.0		11.0	11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)		0		0	0			0			0	0
Act Effct Green (s)	21.8	21.8			14.3		46.3	38.5		46.6	38.7	38.7
Actuated g/C Ratio	0.27	0.27			0.17		0.56	0.47		0.57	0.47	0.47
v/c Ratio	0.67	0.38			0.74		0.74	0.65		0.52	0.85	0.26
Control Delay	44.1	17.7			47.7		43.6	20.4		14.7	27.6	4.3
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	44.1	17.7			47.7		43.6	20.4		14.7	27.6	4.3
LOS	D	B			D		D	C		B	C	A
Approach Delay		30.9			47.7			23.2			24.3	
Approach LOS		C			D			C			C	
90th %ile Green (s)	5.5	28.0		18.0	18.0		7.5	40.4		8.1	41.0	41.0
90th %ile Term Code	Max	Hold		Max	Max		Max	Max		Max	Max	Max
70th %ile Green (s)	5.5	28.0		18.0	18.0		7.5	40.4		8.1	41.0	41.0
70th %ile Term Code	Max	Hold		Max	Max		Max	Hold		Max	Max	Max
50th %ile Green (s)	5.5	26.0		16.0	16.0		7.5	40.4		8.1	41.0	41.0
50th %ile Term Code	Max	Hold		Gap	Gap		Max	Hold		Max	Max	Max
30th %ile Green (s)	5.5	22.7		12.7	12.7		7.5	39.6		8.1	40.2	40.2
30th %ile Term Code	Max	Hold		Gap	Gap		Max	Hold		Max	Gap	Gap
10th %ile Green (s)	0.0	8.1		8.1	8.1		7.5	30.3		6.5	29.3	29.3
10th %ile Term Code	Skip	Hold		Gap	Gap		Max	Hold		Gap	Gap	Gap
Queue Length 50th (ft)	55	28			80		30	199		36	302	0
Queue Length 95th (ft)	#111	75			#165		#132	279		68	#456	31
Internal Link Dist (ft)		732			1025			628			809	
Turn Bay Length (ft)							300			300		150
Base Capacity (vph)	189	422			305		170	1512		312	1544	522
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.67	0.30			0.59		0.74	0.61		0.51	0.78	0.24

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 82.1

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 25.9 Intersection LOS: C

Intersection Capacity Utilization 64.3% ICU Level of Service C

Analysis Period (min) 15

90th %ile Actuated Cycle: 90

70th %ile Actuated Cycle: 90








50th %ile Actuated Cycle: 88

30th %ile Actuated Cycle: 83.9

10th %ile Actuated Cycle: 58.4
























95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 60: Fulton Ind. Blvd. & Boat Rock Blvd./Boat Rock Rd.

 Ø1	 Ø2	 Ø4
12.6 s	44.9 s	32.5 s
 Ø5	 Ø6	 Ø7
12 s	45.5 s	10 s
		 Ø8
		22.5 s













Synchro Report - Signalized Intersections
70: Lakeview Ct. & Fulton Ind. Blvd

Future - 2031 PM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	1102	7	20	1118	31	4	0	30	32	0	7
Future Volume (vph)	9	1102	7	20	1118	31	4	0	30	32	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	300		300	0		0	0		0
Storage Lanes	1		1	1		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.850	
Flt Protected	0.950			0.950				0.950		0.950		
Satd. Flow (prot)	1081	3223	1615	1289	3252	912	0	1444	1495	1347	1252	0
Flt Permitted	0.162			0.117						0.513		
Satd. Flow (perm)	184	3223	1615	159	3252	912	0	1520	1495	727	1252	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			127			127		222	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		849			1099			609			533	
Travel Time (s)		19.3			25.0			13.8			12.1	
Peak Hour Factor	0.86	0.86	0.86	0.98	0.98	0.98	0.72	0.72	0.72	0.60	0.60	0.60
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	67%	12%	0%	40%	11%	77%	25%	0%	8%	34%	0%	29%
Adj. Flow (vph)	12	1486	9	24	1323	37	6	0	48	62	0	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	1486	9	24	1323	37	0	6	48	62	14	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	

Synchro Report - Signalized Intersections
70: Lakeview Ct. & Fulton Ind. Blvd

Future - 2031 PM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	9.5	48.5	48.5	9.5	48.5	48.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (%)	10.6%	53.9%	53.9%	10.6%	53.9%	53.9%	10.6%	25.0%	25.0%	10.6%	25.0%	25.0%
Maximum Green (s)	5.0	44.0	44.0	5.0	44.0	44.0	5.0	18.0	18.0	5.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	47.1	48.0	48.0	47.8	49.6	49.6		6.4	6.4	10.9	11.2	11.2
Actuated g/C Ratio	0.74	0.75	0.75	0.75	0.78	0.78		0.10	0.10	0.17	0.18	0.18
v/c Ratio	0.06	0.61	0.01	0.11	0.52	0.05		0.04	0.18	0.35	0.03	0.03
Control Delay	4.9	10.7	0.0	5.4	7.8	0.1		33.2	1.5	31.1	0.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	10.7	0.0	5.4	7.8	0.1		33.2	1.5	31.1	0.1	0.1
LOS	A	B	A	A	A	A		C	A	C	A	A
Approach Delay		10.6			7.6			5.0			25.4	
Approach LOS		B			A			A			C	
90th %ile Green (s)	5.0	44.0	44.0	5.0	44.0	44.0	0.0	7.2	7.2	5.0	16.7	16.7
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Skip	Gap	Gap	Max	Hold	Hold
70th %ile Green (s)	0.0	44.0	44.0	5.0	53.5	53.5	0.0	6.4	6.4	5.0	15.9	15.9
70th %ile Term Code	Skip	Max	Max	Max	Hold	Hold	Skip	Gap	Gap	Max	Hold	Hold
50th %ile Green (s)	0.0	45.8	45.8	0.0	45.8	45.8	0.0	5.8	5.8	5.0	15.3	15.3
50th %ile Term Code	Skip	Dwell	Dwell	Skip	Dwell	Dwell	Skip	Gap	Gap	Max	Hold	Hold
30th %ile Green (s)	0.0	46.1	46.1	0.0	46.1	46.1	0.0	0.0	0.0	0.0	0.0	0.0
30th %ile Term Code	Skip	Dwell	Dwell	Skip	Dwell	Dwell	Skip	Skip	Skip	Skip	Skip	Skip
10th %ile Green (s)	0.0	35.9	35.9	0.0	35.9	35.9	0.0	0.0	0.0	0.0	0.0	0.0
10th %ile Term Code	Skip	Dwell	Dwell	Skip	Dwell	Dwell	Skip	Skip	Skip	Skip	Skip	Skip
Queue Length 50th (ft)	2	184	0	3	149	0		2	0	22	0	0
Queue Length 95th (ft)	6	359	0	10	317	0		11	0	37	0	0
Internal Link Dist (ft)		769			1019			529			453	
Turn Bay Length (ft)	300		300	300		300						
Base Capacity (vph)	211	2430	1249	214	2531	738		460	541	176	534	534
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.06	0.61	0.01	0.11	0.52	0.05		0.01	0.09	0.35	0.03	0.03

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 63.7

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 9.5

Intersection LOS: A

Intersection Capacity Utilization 54.9%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 79.2

70th %ile Actuated Cycle: 78.4

50th %ile Actuated Cycle: 70.1

30th %ile Actuated Cycle: 50.6














10th %ile Actuated Cycle: 40.4

Splits and Phases: 70: Lakeview Ct. & Fulton Ind. Blvd




Synchro Report - Signalized Intersections
80: Fulton Ind. Blvd & Camp Creek Pkwy

Future - 2031 PM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	883	100	245	769	230	300	610	100	101	300	185
Future Volume (vph)	213	883	100	245	769	230	300	610	100	101	300	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	350		300	350		300	300		300
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			205			206			143			263
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1099			761			631			649	
Travel Time (s)		25.0			17.3			14.3			14.8	
Peak Hour Factor	0.79	0.93	0.92	0.81	0.91	0.92	0.91	0.91	0.91	0.81	0.81	0.81
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	313	1101	126	351	980	290	382	778	127	145	430	265
Shared Lane Traffic (%)												
Lane Group Flow (vph)	313	1101	126	351	980	290	382	778	127	145	430	265
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	

Synchro Report - Signalized Intersections
80: Fulton Ind. Blvd & Camp Creek Pkwy

Future - 2031 PM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6			8			4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	13.0	27.0	27.0	15.5	29.5	29.5	15.0	27.5	27.5	10.0	22.5	22.5
Total Split (%)	16.3%	33.8%	33.8%	19.4%	36.9%	36.9%	18.8%	34.4%	34.4%	12.5%	28.1%	28.1%
Maximum Green (s)	8.5	22.5	22.5	11.0	25.0	25.0	10.5	23.0	23.0	5.5	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	8.5	22.3	22.3	10.7	24.5	24.5	10.5	21.4	21.4	5.5	16.4	16.4
Actuated g/C Ratio	0.11	0.29	0.29	0.14	0.31	0.31	0.13	0.27	0.27	0.07	0.21	0.21
v/c Ratio	0.84	0.76	0.21	0.75	0.88	0.45	0.83	0.80	0.24	0.60	0.58	0.49
Control Delay	55.9	29.7	1.4	43.8	36.7	9.5	50.3	33.5	4.6	47.1	31.1	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	29.7	1.4	43.8	36.7	9.5	50.3	33.5	4.6	47.1	31.1	7.2
LOS	E	C	A	D	D	A	D	C	A	D	C	A
Approach Delay	32.7			33.4			35.6			26.3		
Approach LOS	C			C			D			C		
90th %ile Green (s)	8.5	22.5	22.5	11.0	25.0	25.0	10.5	23.0	23.0	5.5	18.0	18.0
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max
70th %ile Green (s)	8.5	22.5	22.5	11.0	25.0	25.0	10.5	23.0	23.0	5.5	18.0	18.0
70th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max
50th %ile Green (s)	8.5	22.5	22.5	11.0	25.0	25.0	10.5	23.0	23.0	5.5	18.0	18.0
50th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Hold	Hold
30th %ile Green (s)	8.5	22.5	22.5	11.0	25.0	25.0	10.5	21.6	21.6	5.5	16.6	16.6
30th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Gap	Gap	Max	Hold	Hold
10th %ile Green (s)	8.5	21.5	21.5	9.6	22.6	22.6	10.5	17.0	17.0	5.5	12.0	12.0
10th %ile Term Code	Max	Hold	Hold	Gap	Gap	Gap	Max	Gap	Gap	Max	Hold	Hold
Queue Length 50th (ft)	80	184	0	88	242	30	97	185	0	37	100	1
Queue Length 95th (ft)	#119	233	7	117	#355	93	#170	251	31	59	128	40
Internal Link Dist (ft)	1019			681			551			569		
Turn Bay Length (ft)	300		300	350		300	350		300	300		300
Base Capacity (vph)	374	1468	603	485	1135	647	462	1044	568	242	817	568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.75	0.21	0.72	0.86	0.45	0.83	0.75	0.22	0.60	0.53	0.47

Intersection Summary

Synchro Report - Signalized Intersections
 80: Fulton Ind. Blvd & Camp Creek Pkwy

Future - 2031 PM
 08/06/2021

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 78

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 32.6

Intersection LOS: C

Intersection Capacity Utilization 70.4%

ICU Level of Service C

Analysis Period (min) 15

90th %ile Actuated Cycle: 80

70th %ile Actuated Cycle: 80

50th %ile Actuated Cycle: 80

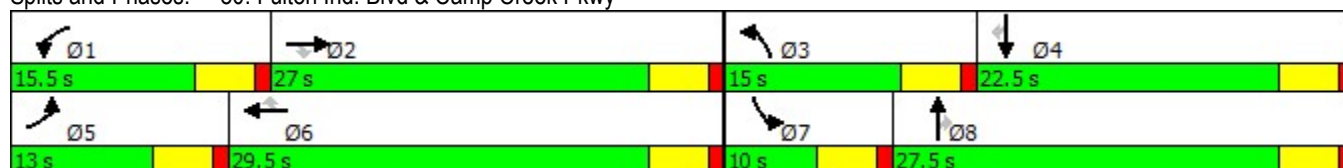
30th %ile Actuated Cycle: 78.6

10th %ile Actuated Cycle: 71.6

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 80: Fulton Ind. Blvd & Camp Creek Pkwy



























Synchro Report - Signalized Intersections

Future - 2031 PM

100: Fulton Ind. Blvd/Fulton Ind. Blvd. & Cascade Rd./Great SW Pkwy

08/06/2021













												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	50	22	327	215	10	70	99	1084	115	114	1537	8
Future Volume (vph)	50	22	327	215	10	70	99	1084	115	114	1537	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		300	300		300
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1900	1568	1736	1429	1538	1641	3252	1442	1671	3252	1380
Flt Permitted	0.731			0.732			0.050			0.100		
Satd. Flow (perm)	1362	1900	1568	1337	1429	1538	86	3252	1442	176	3252	1380
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			109			113			76
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			669			1465			1699	
Travel Time (s)		10.4			15.2			33.3			38.6	
Peak Hour Factor	0.67	0.67	0.67	0.97	0.97	0.97	0.95	0.95	0.95	0.82	0.82	0.82
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	2%	0%	3%	4%	33%	5%	10%	11%	12%	8%	11%	17%
Adj. Flow (vph)	87	38	566	257	12	84	121	1324	140	161	2174	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	87	38	566	257	12	84	121	1324	140	161	2174	11
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm

Synchro Report - Signalized Intersections

Future - 2031 PM

100: Fulton Ind. Blvd/Fulton Ind. Blvd. & Cascade Rd./Great SW Pkwy

08/06/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	10.4	40.0	40.0	9.5	39.1	39.1	10.0	83.9	83.9	16.6	90.5	90.5
Total Split (%)	6.9%	26.7%	26.7%	6.3%	26.1%	26.1%	6.7%	55.9%	55.9%	11.1%	60.3%	60.3%
Maximum Green (s)	5.9	35.5	35.5	5.0	34.6	34.6	5.5	79.4	79.4	12.1	86.0	86.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	41.4	35.5	35.5	39.6	34.6	34.6	86.1	80.6	80.6	95.7	86.0	86.0
Actuated g/C Ratio	0.28	0.24	0.24	0.26	0.23	0.23	0.57	0.54	0.54	0.64	0.57	0.57
v/c Ratio	0.22	0.08	1.25	0.70	0.04	0.19	1.14	0.76	0.17	0.73	1.17	0.01
Control Delay	41.0	45.4	165.7	59.7	45.4	4.5	161.6	30.8	5.1	36.0	111.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	45.4	165.7	59.7	45.4	4.5	161.6	30.8	5.1	36.0	111.9	0.0
LOS	D	D	F	E	D	A	F	C	A	D	F	A
Approach Delay		143.4			46.1			38.5			106.2	
Approach LOS		F			D			D			F	
90th %ile Green (s)	5.9	35.5	35.5	5.0	34.6	34.6	5.5	79.4	79.4	12.1	86.0	86.0
90th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Max	Max	Max	Max	Max
70th %ile Green (s)	5.9	35.5	35.5	5.0	34.6	34.6	5.5	79.4	79.4	12.1	86.0	86.0
70th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Hold	Hold	Max	Max	Max
50th %ile Green (s)	5.9	35.5	35.5	5.0	34.6	34.6	5.5	80.0	80.0	11.5	86.0	86.0
50th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Hold	Hold	Gap	Max	Max
30th %ile Green (s)	5.9	35.5	35.5	5.0	34.6	34.6	5.5	81.3	81.3	10.2	86.0	86.0
30th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Hold	Hold	Gap	Max	Max
10th %ile Green (s)	5.9	35.5	35.5	5.0	34.6	34.6	5.5	83.0	83.0	8.5	86.0	86.0
10th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Hold	Hold	Gap	Max	Max
Queue Length 50th (ft)	63	29	~604	208	9	0	~91	522	12	59	~1325	0
Queue Length 95th (ft)	80	46	#485	298	28	26	#231	622	48	110	#1237	0
Internal Link Dist (ft)		378			589			1385			1619	
Turn Bay Length (ft)							300		300	300		300
Base Capacity (vph)	391	449	454	366	329	438	106	1747	827	233	1864	823
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.08	1.25	0.70	0.04	0.19	1.14	0.76	0.17	0.69	1.17	0.01

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.25

Intersection Signal Delay: 85.5

Intersection LOS: F

Intersection Capacity Utilization 97.8%

ICU Level of Service F

Analysis Period (min) 15

90th %ile Actuated Cycle: 150

70th %ile Actuated Cycle: 150

50th %ile Actuated Cycle: 150

30th %ile Actuated Cycle: 150

10th %ile Actuated Cycle: 150









~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 100: Fulton Ind. Blvd/Fulton Ind. Blvd. & Cascade Rd./Great SW Pkwy

 Ø1	 Ø2	 Ø3	 Ø4
16.6 s	83.9 s	9.5 s	40 s
 Ø5	 Ø6	 Ø7	 Ø8
10 s	90.5 s	10.4 s	39.1 s

Intersection												
Int Delay, s/veh	32											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	6	0	10	11	1	68	73	1301	49	121	816	39
Future Vol, veh/h	6	0	10	11	1	68	73	1301	49	121	816	39
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	0	300	-	300	250	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	88	88	88	97	97	97	80	80	80
Heavy Vehicles, %	17	0	60	18	0	29	4	12	10	9	16	28
Mvmt Flow	11	0	18	15	1	90	87	1556	59	175	1183	57

Major/Minor	Minor2		Minor1		Major1		Major2		Major2		Major2	
Conflicting Flow All	2487	3264	592	2673	3264	778	1183	0	-	1556	0	0
Stage 1	1534	1534	-	1730	1730	-	-	-	-	-	-	-
Stage 2	953	1730	-	943	1534	-	-	-	-	-	-	-
Critical Hdwy	7.84	6.5	8.1	7.86	6.5	7.48	4.18	-	-	4.28	-	-
Critical Hdwy Stg 1	6.84	5.5	-	6.86	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.84	5.5	-	6.86	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4	3.9	3.68	4	3.59	2.24	-	-	2.29	-	-
Pot Cap-1 Maneuver	12	9	330	~ 8	9	286	575	-	0	389	-	-
Stage 1	105	180	-	77	144	-	-	-	0	-	-	-
Stage 2	251	144	-	253	180	-	-	-	0	-	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	~ 4	4	330	~ 4	4	286	575	-	-	389	-	-
Mov Cap-2 Maneuver	~ 4	4	-	~ 4	4	-	-	-	-	-	-	-
Stage 1	89	99	-	65	122	-	-	-	-	-	-	-
Stage 2	145	122	-	131	99	-	-	-	-	-	-	-





















Approach	EB	WB	NB	SB
HCM Control Delay, \$ 1620.8		\$ 469.6	0.7	2.7
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1WBLn1WBLn2	SBL	SBT	SBR
Capacity (veh/h)	575	-	10 4 286 389	-	-	-
HCM Lane V/C Ratio	0.152	-	2.946 3.955 0.313 0.451	-	-	-
HCM Control Delay (s)	12.4	\$ 1620.8	\$ 2999.3 23.2 21.6	-	-	-
HCM Lane LOS	B	-	F F C C	-	-	-
HCM 95th %tile Q(veh)	0.5	-	4.8 3.3 1.3 2.3	-	-	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon













Synchro Report - Signalized Intersections
130: Great SW Pkwy

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	762	0	100	1570	0	0	9	0	0	59	0
Future Volume (vph)	100	762	0	100	1570	0	0	9	0	0	59	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		250	300		300	0		0	0		0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Flt												
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1570	3139	1652	1570	3139	1652	0	2407	0	0	2407	0
Flt Permitted	0.036			0.237								
Satd. Flow (perm)	59	3139	1652	392	3139	1652	0	2407	0	0	2407	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		642			731			251			574	
Travel Time (s)		14.6			16.6			5.7			13.0	
Peak Hour Factor	0.92	0.80	0.92	0.92	0.80	0.92	0.92	0.45	0.92	0.87	0.87	0.92
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	15%	15%	15%	15%	15%	15%	50%	50%	50%	50%	50%	50%
Adj. Flow (vph)	126	1105	0	126	2277	0	0	23	0	0	79	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	126	1105	0	126	2277	0	0	23	0	0	79	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm		NA			NA	

Synchro Report - Signalized Intersections
130: Great SW Pkwy

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5		22.5	22.5	
Total Split (s)	13.0	113.1	113.1	14.4	114.5	114.5	22.5	22.5		22.5	22.5	
Total Split (%)	8.7%	75.4%	75.4%	9.6%	76.3%	76.3%	15.0%	15.0%		15.0%	15.0%	
Maximum Green (s)	8.5	108.6	108.6	9.9	110.0	110.0	18.0	18.0		18.0	18.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5			4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0		0	0	
Act Effect Green (s)	119.8	111.3		117.2	110.0			10.0			10.0	
Actuated g/C Ratio	0.84	0.78		0.83	0.77			0.07			0.07	
v/c Ratio	0.90	0.45		0.33	0.94			0.14			0.47	
Control Delay	90.7	6.0		4.0	22.7			63.3			72.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	90.7	6.0		4.0	22.7			63.3			72.4	
LOS	F	A		A	C			E			E	
Approach Delay		14.7			21.8			63.3			72.4	
Approach LOS		B			C			E			E	
90th %ile Green (s)	8.5	109.9	109.9	8.6	110.0	110.0	13.4	13.4		13.4	13.4	
90th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Hold	Hold		Gap	Gap	
70th %ile Green (s)	8.5	110.8	110.8	7.7	110.0	110.0	11.4	11.4		11.4	11.4	
70th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Hold	Hold		Gap	Gap	
50th %ile Green (s)	8.5	111.4	111.4	7.1	110.0	110.0	10.0	10.0		10.0	10.0	
50th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Hold	Hold		Gap	Gap	
30th %ile Green (s)	8.5	111.9	111.9	6.6	110.0	110.0	8.7	8.7		8.7	8.7	
30th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Hold	Hold		Gap	Gap	
10th %ile Green (s)	8.5	112.5	112.5	6.0	110.0	110.0	6.7	6.7		6.7	6.7	
10th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Hold	Hold		Gap	Gap	
Queue Length 50th (ft)	72	153		12	789			10			37	
Queue Length 95th (ft)	#208	183		26	717			13			64	
Internal Link Dist (ft)		562			651			171			494	
Turn Bay Length (ft)	300			300								
Base Capacity (vph)	140	2460		413	2431			305			305	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.90	0.45		0.31	0.94			0.08			0.26	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 142

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 20.8 Intersection LOS: C

Intersection Capacity Utilization 72.2% ICU Level of Service C

Analysis Period (min) 15

90th %ile Actuated Cycle: 145.4

70th %ile Actuated Cycle: 143.4

50th %ile Actuated Cycle: 142




30th %ile Actuated Cycle: 140.7

10th %ile Actuated Cycle: 138.7

95th percentile volume exceeds capacity, queue may be longer.












Queue shown is maximum after two cycles.

Splits and Phases: 130: Great SW Pkwy

 Ø1	 Ø2	 Ø4
14.4 s	113.1 s	22.5 s
 Ø5	 Ø6	 Ø8
13 s	114.5 s	22.5 s







Synchro Report - Signalized Intersections
140: Bakers Ferry Rd.

Future 2031 - AM
06/27/2021

						
Lane Group	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	69	24	1236	72	47	1181
Future Volume (vph)	69	24	1236	72	47	1181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		300	300	
Storage Lanes	1	0		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	0.965			0.850		
Flt Protected	0.964				0.950	
Satd. Flow (prot)	1544	0	3112	1524	1570	3112
Flt Permitted	0.964				0.098	
Satd. Flow (perm)	1544	0	3112	1524	162	3112
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	22			87		
Link Speed (mph)	30		30			30
Link Distance (ft)	676		615			670
Travel Time (s)	15.4		14.0			15.2
Peak Hour Factor	0.75	0.75	0.96	0.96	0.70	0.70
Growth Factor	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	15%	13%	16%	6%	15%	16%
Adj. Flow (vph)	107	37	1494	87	78	1957
Shared Lane Traffic (%)						
Lane Group Flow (vph)	144	0	1494	87	78	1957
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (ft)	20		100	20	20	100
Trailing Detector (ft)	0		0	0	0	0
Detector 1 Position(ft)	0		0	0	0	0
Detector 1 Size(ft)	20		6	20	20	6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Perm	pm+pt	NA

Synchro Report - Signalized Intersections
140: Bakers Ferry Rd.

Future 2031 - AM
06/27/2021

						
Lane Group	NBL	NBR	NET	NER	SWL	SWT
Protected Phases	8		2		1	6
Permitted Phases				2	6	
Detector Phase	8		2	2	1	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	9.5	22.5
Total Split (s)	22.5		43.0	43.0	9.5	52.5
Total Split (%)	30.0%		57.3%	57.3%	12.7%	70.0%
Maximum Green (s)	18.0		38.5	38.5	5.0	48.0
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Min	Min	None	Min
Walk Time (s)	7.0		7.0	7.0		7.0
Flash Dont Walk (s)	11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)	0		0	0		0
Act Effect Green (s)	10.6		43.4	43.4	49.7	50.8
Actuated g/C Ratio	0.16		0.65	0.65	0.74	0.76
v/c Ratio	0.55		0.74	0.09	0.35	0.83
Control Delay	30.0		15.4	2.4	8.0	13.0
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	30.0		15.4	2.4	8.0	13.0
LOS	C		B	A	A	B
Approach Delay	30.0		14.7			12.8
Approach LOS	C		B			B
90th %ile Green (s)	16.0		38.5	38.5	5.0	48.0
90th %ile Term Code	Gap		Max	Max	Max	Max
70th %ile Green (s)	12.7		38.5	38.5	5.0	48.0
70th %ile Term Code	Gap		Max	Max	Max	Max
50th %ile Green (s)	10.6		38.5	38.5	5.0	48.0
50th %ile Term Code	Gap		Max	Max	Max	Max
30th %ile Green (s)	8.7		39.0	39.0	5.0	48.5
30th %ile Term Code	Gap		Dwell	Dwell	Max	Dwell
10th %ile Green (s)	0.0		54.0	54.0	0.0	54.0
10th %ile Term Code	Skip		Dwell	Dwell	Skip	Dwell
Queue Length 50th (ft)	47		242	0	8	262
Queue Length 95th (ft)	77		#467	19	18	270
Internal Link Dist (ft)	596		535			590
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	433		2015	1017	225	2358
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.33		0.74	0.09	0.35	0.83

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 67

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 14.2

Intersection LOS: B

Intersection Capacity Utilization 58.9%

ICU Level of Service B

Analysis Period (min) 15

90th %ile Actuated Cycle: 73

70th %ile Actuated Cycle: 69.7

50th %ile Actuated Cycle: 67.6

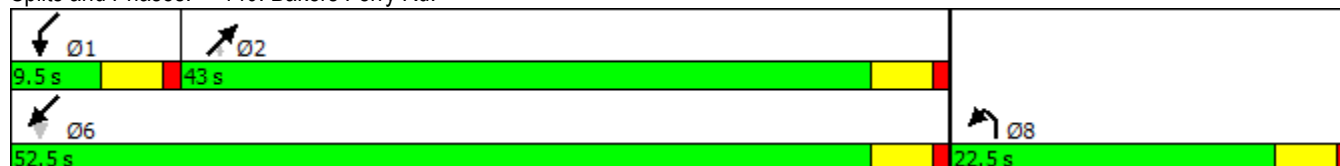
30th %ile Actuated Cycle: 66.2

10th %ile Actuated Cycle: 58.5

95th percentile volume exceeds capacity, queue may be longer.




















Queue shown is maximum after two cycles.

Splits and Phases: 140: Bakers Ferry Rd.















Synchro Report - Signalized Intersections
150: Mendel Dr./Wharton Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	35	7	7	13	7	26	29	1073	20	66	1329	152
Future Volume (vph)	35	7	7	13	7	26	29	1073	20	66	1329	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	300		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Frt		0.925			0.924			0.997			0.985	
Flt Protected	0.950				0.986		0.950			0.950		
Satd. Flow (prot)	1399	1643	0	0	1324	0	1687	4536	0	1467	4583	0
Flt Permitted	0.926				0.897		0.950			0.950		
Satd. Flow (perm)	1364	1643	0	0	1205	0	1687	4536	0	1467	4583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			40			4			38	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		409			537			753			584	
Travel Time (s)		9.3			12.2			17.1			13.3	
Peak Hour Factor	0.71	0.71	0.71	0.76	0.76	0.76	0.97	0.97	0.97	0.68	0.68	0.68
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	29%	0%	14%	31%	0%	39%	7%	14%	15%	23%	12%	7%
Adj. Flow (vph)	57	11	11	20	11	40	35	1283	24	113	2267	259
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	22	0	0	71	0	35	1307	0	113	2526	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	

Synchro Report - Signalized Intersections
150: Mendel Dr./Wharton Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	22.6	22.6		22.6	22.6		9.6	35.4		17.0	42.8	
Total Split (%)	30.1%	30.1%		30.1%	30.1%		12.8%	47.2%		22.7%	57.1%	
Maximum Green (s)	18.1	18.1		18.1	18.1		5.1	30.9		12.5	38.3	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)	8.5	8.5			8.2		5.2	35.7		9.6	45.6	
Actuated g/C Ratio	0.14	0.14			0.14		0.09	0.60		0.16	0.77	
v/c Ratio	0.29	0.09			0.35		0.24	0.48		0.48	0.72	
Control Delay	28.2	18.5			19.3		33.0	11.1		30.9	11.0	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	28.2	18.5			19.3		33.0	11.1		30.9	11.0	
LOS	C	B			B		C	B		C	B	
Approach Delay		25.5			19.3			11.7			11.8	
Approach LOS		C			B			B			B	
90th %ile Green (s)	12.5	12.5		12.5	12.5		5.1	30.9		12.5	38.3	
90th %ile Term Code	Gap	Gap		Hold	Hold		Max	Max		Max	Max	
70th %ile Green (s)	10.1	10.1		10.1	10.1		5.1	31.4		12.0	38.3	
70th %ile Term Code	Gap	Gap		Hold	Hold		Max	Hold		Gap	Max	
50th %ile Green (s)	8.4	8.4		8.4	8.4		0.0	27.7		10.1	42.3	
50th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Gap		Gap	Hold	
30th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	26.9		7.6	39.0	
30th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Dwell		Gap	Dwell	
10th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	53.3		0.0	53.3	
10th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Dwell		Skip	Dwell	
Queue Length 50th (ft)	19	4			10		12	121		37	160	
Queue Length 95th (ft)	40	16			34		41	196		65	247	
Internal Link Dist (ft)		329			457			673			504	
Turn Bay Length (ft)							300			300		
Base Capacity (vph)	426	521			404		148	2851		316	3521	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.13	0.04			0.18		0.24	0.46		0.36	0.72	

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 59.5

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 12.2

Intersection LOS: B

Intersection Capacity Utilization 58.9%

ICU Level of Service B

Analysis Period (min) 15

90th %ile Actuated Cycle: 69.4

70th %ile Actuated Cycle: 67

50th %ile Actuated Cycle: 59.7

30th %ile Actuated Cycle: 43.5
























10th %ile Actuated Cycle: 57.8

Splits and Phases: 150: Mendel Dr./Wharton Dr.















Synchro Report - Signalized Intersections
160: Marvin Miller Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations								  			  	
Traffic Volume (vph)	20	0	7	4	0	14	15	1225	11	9	1415	58
Future Volume (vph)	20	0	7	4	0	14	15	1225	11	9	1415	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		250	200		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Frt		0.966			0.928				0.850		0.994	
Flt Protected		0.964			0.977		0.950			0.950		
Satd. Flow (prot)	0	1413	0	0	1273	0	1687	4550	1404	1467	4612	0
Flt Permitted		0.800			0.864		0.950			0.950		
Satd. Flow (perm)	0	1173	0	0	1126	0	1687	4550	1404	1467	4612	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		44			44				44		10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		720			447			1232			950	
Travel Time (s)		16.4			10.2			28.0			21.6	
Peak Hour Factor	0.57	0.57	0.57	0.25	0.75	0.75	0.91	0.91	0.91	0.73	0.73	0.73
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	29%	0%	14%	31%	0%	39%	7%	14%	15%	23%	12%	7%
Adj. Flow (vph)	41	0	14	19	0	22	19	1562	14	14	2248	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	55	0	0	41	0	19	1562	14	14	2340	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	

Synchro Report - Signalized Intersections
160: Marvin Miller Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5	22.5	9.5	22.5	
Total Split (s)	25.0	25.0		25.0	25.0		12.0	113.0	113.0	12.0	113.0	
Total Split (%)	16.7%	16.7%		16.7%	16.7%		8.0%	75.3%	75.3%	8.0%	75.3%	
Maximum Green (s)	20.5	20.5		20.5	20.5		7.5	108.5	108.5	7.5	108.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		None	C-Min	C-Min	Min	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	
Act Effect Green (s)		8.1			8.1		7.3	123.3	123.3	7.1	128.2	
Actuated g/C Ratio		0.05			0.05		0.05	0.82	0.82	0.05	0.85	
v/c Ratio		0.53			0.40		0.23	0.42	0.01	0.20	0.59	
Control Delay		41.8			27.4		74.9	4.5	0.0	77.7	7.2	
Queue Delay		0.1			0.0		0.0	0.1	0.0	0.0	0.3	
Total Delay		41.9			27.4		74.9	4.6	0.0	77.7	7.4	
LOS		D			C		E	A	A	E	A	
Approach Delay		41.9			27.4			5.4			7.9	
Approach LOS		D			C			A			A	
90th %ile Green (s)	13.1	13.1		13.1	13.1		9.5	114.2	114.2	9.2	113.9	
90th %ile Term Code	Gap	Gap		Hold	Hold		Gap	Coord	Coord	Gap	Coord	
70th %ile Green (s)	9.4	9.4		9.4	9.4		8.1	119.2	119.2	7.9	119.0	
70th %ile Term Code	Gap	Gap		Hold	Hold		Gap	Coord	Coord	Gap	Coord	
50th %ile Green (s)	6.9	6.9		6.9	6.9		7.1	122.7	122.7	6.9	122.5	
50th %ile Term Code	Gap	Gap		Hold	Hold		Gap	Coord	Coord	Gap	Coord	
30th %ile Green (s)	5.5	5.5		5.5	5.5		0.0	125.1	125.1	5.9	135.5	
30th %ile Term Code	Gap	Gap		Gap	Gap		Skip	Coord	Coord	Gap	Coord	
10th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	135.5	135.5	5.5	145.5	
10th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Coord	Coord	Gap	Coord	
Queue Length 50th (ft)		11			0		18	128	0	15	160	
Queue Length 95th (ft)		20			24		47	204	0	m11	m0	
Internal Link Dist (ft)		640			367			1152			870	
Turn Bay Length (ft)							250		250	200		
Base Capacity (vph)		198			191		90	3741	1162	77	3942	
Starvation Cap Reductn		0			0		0	0	0	0	758	
Spillback Cap Reductn		6			0		0	681	0	0	0	
Storage Cap Reductn		0			0		0	0	0	0	0	
Reduced v/c Ratio		0.29			0.21		0.21	0.51	0.01	0.18	0.73	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 58 (39%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 7.6

Intersection LOS: A


Intersection Capacity Utilization 45.5%

ICU Level of Service A

Analysis Period (min) 15




















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 160: Marvin Miller Dr.

 Ø1	 Ø2 (R)	 Ø4
12 s	113 s	25 s
 Ø5	 Ø6 (R)	 Ø8
12 s	113 s	25 s













Synchro Report - Signalized Intersections
170: Patton Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	51	0	0	527	0	175	2432	0	17	1647	0
Future Volume (vph)	0	51	0	0	527	0	175	2432	0	17	1647	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		0	300		0
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Flt												
Flt Protected							0.950			0.950		
Satd. Flow (prot)	0	1863	0	0	1863	0	1770	5085	0	1770	5085	1863
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1863	0	0	1863	0	1770	5085	0	1770	5085	1863
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		749			928			950			975	
Travel Time (s)		17.0			21.1			21.6			22.2	
Peak Hour Factor	0.85	0.85	0.85	0.92	0.88	0.92	0.47	0.88	0.92	0.53	0.73	0.92
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	0	70	0	0	695	0	432	3206	0	37	2617	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	695	0	432	3206	0	37	2617	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA			NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	

Synchro Report - Signalized Intersections
170: Patton Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	4			8								6
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	22.5
Total Split (s)	50.0	50.0		50.0	50.0		33.0	90.5		9.5	67.0	67.0
Total Split (%)	33.3%	33.3%		33.3%	33.3%		22.0%	60.3%		6.3%	44.7%	44.7%
Maximum Green (s)	45.5	45.5		45.5	45.5		28.5	86.0		5.0	62.5	62.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0			0	0
Act Effect Green (s)		45.5			45.5		28.5	87.9		5.0	62.5	
Actuated g/C Ratio		0.30			0.30		0.19	0.59		0.03	0.42	
v/c Ratio		0.12			1.23		1.29	1.08		0.63	1.24	
Control Delay		38.7			162.0		198.8	70.5		112.2	148.2	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		38.7			162.0		198.8	70.5		112.2	148.2	
LOS		D			F		F	E		F	F	
Approach Delay		38.7			162.0			85.7			147.7	
Approach LOS		D			F			F			F	
90th %ile Green (s)	45.5	45.5		45.5	45.5		28.5	86.0		5.0	62.5	62.5
90th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Max	Coord	Coord
70th %ile Green (s)	45.5	45.5		45.5	45.5		28.5	86.0		5.0	62.5	62.5
70th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Max	Coord	Coord
50th %ile Green (s)	45.5	45.5		45.5	45.5		28.5	86.0		5.0	62.5	62.5
50th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Max	Coord	Coord
30th %ile Green (s)	45.5	45.5		45.5	45.5		28.5	86.0		5.0	62.5	62.5
30th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Max	Coord	Coord
10th %ile Green (s)	45.5	45.5		45.5	45.5		28.5	95.5		0.0	62.5	62.5
10th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Skip	Coord	Coord
Queue Length 50th (ft)		50			~837		~544	~1302		36	~1157	
Queue Length 95th (ft)		85			#1046		279	#1315		46	#855	
Internal Link Dist (ft)		669			848			870			895	
Turn Bay Length (ft)							200			300		
Base Capacity (vph)		565			565		336	2979		59	2118	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.12			1.23		1.29	1.08		0.63	1.24	
Intersection Summary												

Synchro Report - Signalized Intersections

170: Patton Dr.

Future 2031 - AM
06/27/2021

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 58 (39%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.29

Intersection Signal Delay: 116.1

Intersection LOS: F

Intersection Capacity Utilization 102.1%

ICU Level of Service G

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.



















Queue shown is maximum after two cycles.

Splits and Phases: 170: Patton Dr.















Synchro Report - Signalized Intersections
180: Commerce Cir.

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	9	1311	4	84	1648	2	12	0	4	12	0	21
Future Volume (vph)	9	1311	4	84	1648	2	12	0	4	12	0	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Frt								0.966			0.913	
Flt Protected	0.950			0.950				0.964			0.982	
Satd. Flow (prot)	1504	4427	0	902	5684	0	0	1594	0	0	939	0
Flt Permitted	0.950			0.950				0.789			0.872	
Satd. Flow (perm)	1504	4427	0	902	5684	0	0	1305	0	0	834	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)								95			95	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		760			245			480			470	
Travel Time (s)		17.3			5.6			10.9			10.7	
Peak Hour Factor	0.95	0.95	0.95	0.79	0.79	0.79	0.77	0.77	0.77	0.72	0.72	0.72
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	20%	17%	73%	100%	15%	9%	5%	0%	29%	100%	0%	71%
Adj. Flow (vph)	11	1601	5	123	2420	3	18	0	6	19	0	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	1606	0	123	2423	0	0	24	0	0	53	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	

Synchro Report - Signalized Intersections
180: Commerce Cir.

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Protected Phases	5	2		1	6			4				8
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	9.5	62.0		35.0	87.5		23.0	23.0		23.0	23.0	
Total Split (%)	7.9%	51.7%		29.2%	72.9%		19.2%	19.2%		19.2%	19.2%	
Maximum Green (s)	5.0	57.5		30.5	83.0		18.5	18.5		18.5	18.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	6.5	81.2		21.5	105.6			5.8			5.8	
Actuated g/C Ratio	0.05	0.68		0.18	0.88			0.05			0.05	
v/c Ratio	0.14	0.54		0.76	0.48			0.16			0.41	
Control Delay	57.2	12.3		77.3	2.6			2.2			11.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	57.2	12.3		77.3	2.6			2.2			11.1	
LOS	E	B		E	A			A			B	
Approach Delay		12.6			6.2			2.2			11.1	
Approach LOS		B			A			A			B	
90th %ile Green (s)	8.1	68.2		31.5	91.6		6.8	6.8		6.8	6.8	
90th %ile Term Code	Gap	Coord		Gap	Coord		Hold	Hold		Gap	Gap	
70th %ile Green (s)	0.0	75.2		25.8	105.5		5.5	5.5		5.5	5.5	
70th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Gap	Gap	
50th %ile Green (s)	0.0	79.4		21.6	105.5		5.5	5.5		5.5	5.5	
50th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Gap	Gap	
30th %ile Green (s)	0.0	83.6		17.4	105.5		5.5	5.5		5.5	5.5	
30th %ile Term Code	Skip	Coord		Gap	Coord		Hold	Hold		Gap	Gap	
10th %ile Green (s)	0.0	99.7		11.3	115.5		0.0	0.0		0.0	0.0	
10th %ile Term Code	Skip	Coord		Gap	Coord		Skip	Skip		Skip	Skip	
Queue Length 50th (ft)	8	221		99	122			0			0	
Queue Length 95th (ft)	28	343		146	93			0			0	
Internal Link Dist (ft)		680			165			400			390	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	81	2996		230	5003			281			208	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.14	0.54		0.53	0.48			0.09			0.25	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 116 (97%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 8.7

Intersection LOS: A

Intersection Capacity Utilization 50.3%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 180: Commerce Cir.



Synchro Report - Unsignalized Intersections
190: Fulton Ind. Circle

Future 2031 - AM
06/27/2021





















Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↑
Traffic Volume (vph)	0	1372	1717	33	0	17
Future Volume (vph)	0	1372	1717	33	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.86	0.86	0.86	1.00	1.00
Frt			0.997			0.865
Flt Protected						
Satd. Flow (prot)	0	6408	6389	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	6408	6389	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		245	541		662	
Travel Time (s)		5.6	12.3		15.0	
Peak Hour Factor	0.96	0.96	0.78	0.78	0.53	0.53
Growth Factor	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	0	1658	2553	49	0	37
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1658	2602	0	0	37
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.5%
Analysis Period (min)	15
	ICU Level of Service A













Synchro Report - Signalized Intersections
200: Shirley Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	1337	14	72	1704	1	15	0	52	1	0	0
Future Volume (vph)	6	1337	14	72	1704	1	15	0	52	1	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998						0.895				
Flt Protected	0.950			0.950				0.989			0.950	
Satd. Flow (prot)	1770	6395	0	1770	6408	0	0	1649	0	0	1770	0
Flt Permitted	0.950			0.950				0.923			0.588	
Satd. Flow (perm)	1770	6395	0	1770	6408	0	0	1539	0	0	1095	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2						95				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		541			537			437			323	
Travel Time (s)		12.3			12.2			9.9			7.3	
Peak Hour Factor	0.99	0.99	0.99	0.78	0.78	0.78	0.86	0.86	0.86	0.50	0.50	0.50
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	7	1567	16	107	2534	1	20	0	70	2	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	1583	0	107	2535	0	0	90	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	

Synchro Report - Signalized Intersections
200: Shirley Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							8			4		
Detector Phase	5	2			1	6	8	8			4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0	5.0			5.0	5.0
Minimum Split (s)	9.5	22.5			9.5	22.5	22.5	22.5			22.5	22.5
Total Split (s)	11.0	69.0			25.0	83.0	26.0	26.0			26.0	26.0
Total Split (%)	9.2%	57.5%			20.8%	69.2%	21.7%	21.7%			21.7%	21.7%
Maximum Green (s)	6.5	64.5			20.5	78.5	21.5	21.5			21.5	21.5
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5	3.5			3.5	3.5
All-Red Time (s)	1.0	1.0			1.0	1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)	0.0	0.0			0.0	0.0			0.0			0.0
Total Lost Time (s)	4.5	4.5			4.5	4.5			4.5			4.5
Lead/Lag	Lead	Lag			Lead	Lag						
Lead-Lag Optimize?	Yes	Yes			Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0			3.0	3.0
Recall Mode	Min	C-Max			Min	C-Max	None	None			None	None
Walk Time (s)			7.0			7.0	7.0	7.0			7.0	7.0
Flash Dont Walk (s)			11.0			11.0	11.0	11.0			11.0	11.0
Pedestrian Calls (#/hr)			0			0	0	0			0	0
Act Effct Green (s)	6.1	87.1			12.6	93.6			6.8			6.8
Actuated g/C Ratio	0.05	0.73			0.10	0.78			0.06			0.06
v/c Ratio	0.08	0.34			0.58	0.51			0.51			0.03
Control Delay	50.9	3.7			67.9	2.3			19.9			53.0
Queue Delay	0.0	0.0			0.0	0.1			0.0			0.0
Total Delay	50.9	3.7			67.9	2.4			19.9			53.0
LOS	D	A			E	A			B			D
Approach Delay			3.9			5.1			19.9			53.0
Approach LOS			A			A			B			D
90th %ile Green (s)	7.2	78.7			17.4	88.9	10.4	10.4			10.4	10.4
90th %ile Term Code	Gap	Coord			Gap	Coord	Gap	Gap			Hold	Hold
70th %ile Green (s)	6.4	84.7			14.6	92.9	7.2	7.2			7.2	7.2
70th %ile Term Code	Gap	Coord			Gap	Coord	Gap	Gap			Hold	Hold
50th %ile Green (s)	5.9	88.3			12.6	95.0	5.6	5.6			5.6	5.6
50th %ile Term Code	Gap	Coord			Gap	Coord	Hold	Hold			Hold	Hold
30th %ile Green (s)	5.5	90.4			10.6	95.5	5.5	5.5			5.5	5.5
30th %ile Term Code	Gap	Coord			Gap	Coord	Gap	Gap			Hold	Hold
10th %ile Green (s)	5.5	93.3			7.7	95.5	5.5	5.5			5.5	5.5
10th %ile Term Code	Gap	Coord			Gap	Coord	Gap	Gap			Hold	Hold
Queue Length 50th (ft)	6	15			83	56			0			2
Queue Length 95th (ft)	m11	59			m107	m86			42			6
Internal Link Dist (ft)			461			457			357			243
Turn Bay Length (ft)	300			150								
Base Capacity (vph)	97	4641			302	4996			353			196
Starvation Cap Reductn	0	0			0	744			0			0
Spillback Cap Reductn	0	0			0	0			0			0
Storage Cap Reductn	0	0			0	0			0			0
Reduced v/c Ratio	0.07	0.34			0.35	0.60			0.25			0.01
Intersection Summary												

Synchro Report - Signalized Intersections

200: Shirley Dr.

Future 2031 - AM
06/27/2021

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 111 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 5.0

Intersection LOS: A

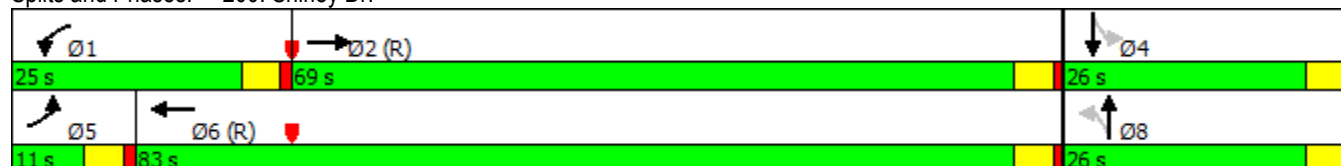
Intersection Capacity Utilization 48.4%

ICU Level of Service A

Analysis Period (min) 15




















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Shirley Dr.















Synchro Report - Signalized Intersections
210: I-20 EB Ramp

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	326	0	373	0	0	0	0	792	1211	579	1548	0
Future Volume (vph)	326	0	373	0	0	0	0	792	1211	579	1548	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	225		0	0		0
Storage Lanes	2		1	0		0	0		2	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.88	1.00	0.91	1.00
Frt			0.850						0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	3242	0	1524	0	0	0	0	5836	2538	1719	4631	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	3242	0	1524	0	0	0	0	5836	2538	1719	4631	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55						838			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		758			734			537			524	
Travel Time (s)		17.2			16.7			12.2			11.9	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.97	0.97	0.97	0.94	0.94	0.94
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	8%	2%	6%	2%	2%	2%	12%	12%	12%	5%	12%	2%
Adj. Flow (vph)	430	0	492	0	0	0	0	947	1448	715	1910	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	430	0	492	0	0	0	0	947	1448	715	1910	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1					2	1	1	2	
Detector Template	Left		Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20		20					100	20	20	100	
Trailing Detector (ft)	0		0					0	0	0	0	
Detector 1 Position(ft)	0		0					0	0	0	0	
Detector 1 Size(ft)	20		20					6	20	20	6	
Detector 1 Type	Cl+Ex		Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Prot		Perm					NA	Perm	Prot	NA	

Synchro Report - Signalized Intersections
210: I-20 EB Ramp

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	7							2		1	6	
Permitted Phases			7						2			
Detector Phase	7		7					2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0		5.0					5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5		9.5					22.5	22.5	9.5	22.5	
Total Split (s)	32.0		32.0					42.0	42.0	46.0	88.0	
Total Split (%)	26.7%		26.7%					35.0%	35.0%	38.3%	73.3%	
Maximum Green (s)	27.5		27.5					37.5	37.5	41.5	83.5	
Yellow Time (s)	3.5		3.5					3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0		1.0					1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5		4.5					4.5	4.5	4.5	4.5	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0		3.0					3.0	3.0	3.0	3.0	
Recall Mode	None		None					C-Min	C-Min	None	C-Min	
Walk Time (s)								7.0	7.0		7.0	
Flash Dont Walk (s)								11.0	11.0		11.0	
Pedestrian Calls (#/hr)								0	0		0	
Act Effct Green (s)	27.5		27.5					37.5	37.5	41.5	83.5	
Actuated g/C Ratio	0.23		0.23					0.31	0.31	0.35	0.70	
v/c Ratio	0.58		1.26					0.52	1.06	1.20	0.59	
Control Delay	44.8		170.4					26.6	54.5	138.8	7.9	
Queue Delay	0.0		0.0					0.0	17.3	0.3	0.4	
Total Delay	44.8		170.4					26.6	71.9	139.1	8.4	
LOS	D		F					C	E	F	A	
Approach Delay		111.8						53.9			44.0	
Approach LOS		F						D			D	
90th %ile Green (s)	27.5		27.5					37.5	37.5	41.5	83.5	
90th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
70th %ile Green (s)	27.5		27.5					37.5	37.5	41.5	83.5	
70th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
50th %ile Green (s)	27.5		27.5					37.5	37.5	41.5	83.5	
50th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
30th %ile Green (s)	27.5		27.5					37.5	37.5	41.5	83.5	
30th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
10th %ile Green (s)	27.5		27.5					37.5	37.5	41.5	83.5	
10th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
Queue Length 50th (ft)	153		~445					174	~426	~665	279	
Queue Length 95th (ft)	202		#637					136	#622	#905	209	
Internal Link Dist (ft)		678			654			457			444	
Turn Bay Length (ft)												
Base Capacity (vph)	742		391					1823	1369	594	3222	
Starvation Cap Reductn	0		0					0	72	25	717	
Spillback Cap Reductn	0		0					0	0	0	0	
Storage Cap Reductn	0		0					0	0	0	0	
Reduced v/c Ratio	0.58		1.26					0.52	1.12	1.26	0.76	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 13 (11%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.26

Intersection Signal Delay: 58.5

Intersection LOS: E

Intersection Capacity Utilization 108.4%

ICU Level of Service G

Analysis Period (min) 15

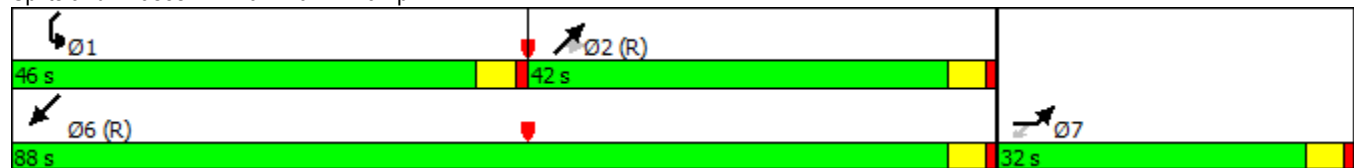
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.



















Queue shown is maximum after two cycles.

Splits and Phases: 210: I-20 EB Ramp















Synchro Report - Signalized Intersections
220: I-20 WB Ramp

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	1000	0	326	104	964	0	0	1158	192
Future Volume (vph)	0	0	0	1000	0	326	104	964	0	0	1158	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		400	0		0	0		0
Storage Lanes	0		0	3		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.94	1.00	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Frt						0.850					0.979	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	4545	0	1524	1517	4715	0	0	5972	0
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	4545	0	1524	1517	4715	0	0	5972	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						58					39	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		487			795			524			744	
Travel Time (s)		11.1			18.1			11.9			16.9	
Peak Hour Factor	0.92	0.92	0.92	0.91	0.91	0.91	0.92	0.92	0.92	0.90	0.90	0.90
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	2%	2%	2%	12%	2%	6%	19%	10%	2%	16%	8%	2%
Adj. Flow (vph)	0	0	0	1275	0	416	131	1215	0	0	1493	247
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	1275	0	416	131	1215	0	0	1740	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		36			36			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	
Detector Template				Left		Right	Left	Thru			Thru	
Leading Detector (ft)				20		20	20	100			100	
Trailing Detector (ft)				0		0	0	0			0	
Detector 1 Position(ft)				0		0	0	0			0	
Detector 1 Size(ft)				20		20	20	6			6	
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Prot		Perm	Prot	NA			NA	

Synchro Report - Signalized Intersections
220: I-20 WB Ramp

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases				3			5	2			6	
Permitted Phases						8						
Detector Phase				3		8	5	2			6	
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	
Minimum Split (s)				9.5		22.5	9.5	22.5			22.5	
Total Split (s)				49.0		49.0	23.0	71.0			48.0	
Total Split (%)				40.8%		40.8%	19.2%	59.2%			40.0%	
Maximum Green (s)				44.5		44.5	18.5	66.5			43.5	
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	
Recall Mode				None		None	None	C-Min			C-Min	
Walk Time (s)						7.0		7.0			7.0	
Flash Dont Walk (s)						11.0		11.0			11.0	
Pedestrian Calls (#/hr)						0		0			0	
Act Effect Green (s)				40.2		40.2	14.9	70.8			51.4	
Actuated g/C Ratio				0.34		0.34	0.12	0.59			0.43	
v/c Ratio				0.84		0.76	0.70	0.44			0.67	
Control Delay				42.3		39.7	58.0	6.7			25.8	
Queue Delay				0.0		0.0	0.0	0.2			0.4	
Total Delay				42.3		39.7	58.0	6.9			26.3	
LOS				D		D	E	A			C	
Approach Delay					41.7			11.9			26.3	
Approach LOS					D			B			C	
90th %ile Green (s)				44.5		44.5	18.5	66.5			43.5	
90th %ile Term Code				Max		Max	Max	Coord			Coord	
70th %ile Green (s)				43.3		43.3	18.1	67.7			45.1	
70th %ile Term Code				Gap		Hold	Gap	Coord			Coord	
50th %ile Green (s)				41.0		41.0	15.6	70.0			49.9	
50th %ile Term Code				Gap		Hold	Gap	Coord			Coord	
30th %ile Green (s)				38.0		38.0	13.0	73.0			55.5	
30th %ile Term Code				Gap		Hold	Gap	Coord			Coord	
10th %ile Green (s)				34.3		34.3	9.4	76.7			62.8	
10th %ile Term Code				Gap		Hold	Gap	Coord			Coord	
Queue Length 50th (ft)				318		247	94	224			259	
Queue Length 95th (ft)				359		357	158	252			330	
Internal Link Dist (ft)		407			715			444			664	
Turn Bay Length (ft)						400						
Base Capacity (vph)				1685		601	233	2781			2578	
Starvation Cap Reductn				0		0	0	740			0	
Spillback Cap Reductn				6		0	0	0			359	
Storage Cap Reductn				0		0	0	0			0	
Reduced v/c Ratio				0.76		0.69	0.56	0.60			0.78	

Synchro Report - Signalized Intersections
220: I-20 WB Ramp

Future 2031 - AM
06/27/2021

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 62 (52%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 27.7

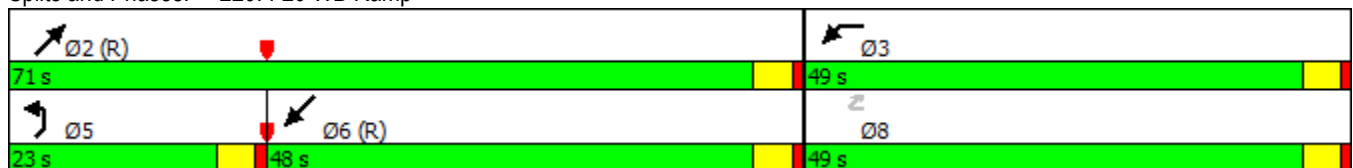
Intersection LOS: C

Intersection Capacity Utilization 108.4%

ICU Level of Service G



















Analysis Period (min) 15













Splits and Phases: 220: I-20 WB Ramp



Synchro Report - Signalized Intersections
230: Wendell Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	76	934	110	22	736	25	10	3	24	68	6	12
Future Volume (vph)	76	934	110	22	736	25	10	3	24	68	6	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	200		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984			0.995			0.911			0.981	
Flt Protected	0.950			0.950				0.987			0.962	
Satd. Flow (prot)	1597	4658	0	1805	4614	0	0	1564	0	0	1572	0
Flt Permitted	0.273			0.187				0.914			0.733	
Satd. Flow (perm)	459	4658	0	355	4614	0	0	1448	0	0	1198	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		54			13			44			14	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			1498			395			449	
Travel Time (s)		16.9			34.0			9.0			10.2	
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.64	0.64	0.64	0.89	0.89	0.89
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	13%	10%	6%	0%	12%	8%	2%	2%	13%	16%	17%	2%
Adj. Flow (vph)	96	1178	139	29	970	33	18	5	44	89	8	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	96	1317	0	29	1003	0	0	67	0	0	113	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	37.5	37.5		37.5	37.5		22.5	22.5		22.5	22.5	
Total Split (%)	62.5%	62.5%		62.5%	62.5%		37.5%	37.5%		37.5%	37.5%	
Maximum Green (s)	33.0	33.0		33.0	33.0		18.0	18.0		18.0	18.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)	43.7	43.7		43.7	43.7			10.2			10.2	
Actuated g/C Ratio	0.73	0.73		0.73	0.73			0.17			0.17	
v/c Ratio	0.29	0.39		0.11	0.30			0.24			0.53	
Control Delay	5.5	3.3		6.0	5.0			11.9			27.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	5.5	3.3		6.0	5.0			11.9			27.9	
LOS	A	A		A	A			B			C	
Approach Delay		3.4			5.1			11.9			27.9	
Approach LOS		A			A			B			C	
90th %ile Green (s)	35.8	35.8		35.8	35.8		15.2	15.2		15.2	15.2	
90th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
70th %ile Green (s)	38.8	38.8		38.8	38.8		12.2	12.2		12.2	12.2	
70th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
50th %ile Green (s)	40.8	40.8		40.8	40.8		10.2	10.2		10.2	10.2	
50th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
30th %ile Green (s)	42.9	42.9		42.9	42.9		8.1	8.1		8.1	8.1	
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
10th %ile Green (s)	55.5	55.5		55.5	55.5		0.0	0.0		0.0	0.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		Skip	Skip		Skip	Skip	
Queue Length 50th (ft)	2	5		3	63			7			33	
Queue Length 95th (ft)	m56	118		m6	m78			18			68	
Internal Link Dist (ft)		664			1418			315			369	
Turn Bay Length (ft)	150			200								
Base Capacity (vph)	334	3404		258	3361			465			369	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.29	0.39		0.11	0.30			0.14			0.31	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 5 (8%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 5.3

Intersection LOS: A









Intersection Capacity Utilization 51.4%

ICU Level of Service A

Analysis Period (min) 15

























m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 230: Wendell Dr.

 Ø2 (R)  37.5 s	 Ø4  22.5 s
 Ø6 (R)  37.5 s	 Ø8  22.5 s













Synchro Report - Signalized Intersections
240: MLK Jr. Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	333	847	831	119	258	20	360	728	159	35	387	76
Future Volume (vph)	333	847	831	119	258	20	360	728	159	35	387	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	250		400	350		0	300		0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3273	3505	1553	3183	3539	1538	3335	3223	1455	3072	3034	1538
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3273	3505	1553	3183	3539	1538	3335	3223	1455	3072	3034	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			335			177			177			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1101			1180			1498			1729	
Travel Time (s)		25.0			26.8			34.0			39.3	
Peak Hour Factor	0.91	0.91	0.91	0.81	0.81	0.81	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	7%	3%	4%	10%	2%	5%	5%	12%	11%	14%	19%	5%
Adj. Flow (vph)	424	1080	1059	170	369	29	435	880	192	42	468	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	424	1080	1059	170	369	29	435	880	192	42	468	92
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm

Synchro Report - Signalized Intersections
240: MLK Jr. Dr.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	27.6	63.0	63.0	11.0	46.4	46.4	20.3	36.5	36.5	9.5	25.7	25.7
Total Split (%)	23.0%	52.5%	52.5%	9.2%	38.7%	38.7%	16.9%	30.4%	30.4%	7.9%	21.4%	21.4%
Maximum Green (s)	23.1	58.5	58.5	6.5	41.9	41.9	15.8	32.0	32.0	5.0	21.2	21.2
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	20.1	58.5	58.5	6.5	44.9	44.9	15.8	33.9	33.9	5.0	21.2	21.2
Actuated g/C Ratio	0.17	0.49	0.49	0.05	0.37	0.37	0.13	0.28	0.28	0.04	0.18	0.18
v/c Ratio	0.77	0.63	1.14	0.99	0.28	0.04	0.99	0.97	0.36	0.33	0.87	0.22
Control Delay	57.7	24.9	98.2	122.6	27.5	0.1	88.2	52.7	3.8	54.7	64.6	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.7	24.9	98.2	122.6	27.5	0.1	88.2	52.7	3.8	54.7	64.6	9.6
LOS	E	C	F	F	C	A	F	D	A	D	E	A
Approach Delay		60.6			54.6			56.7			55.5	
Approach LOS		E			D			E			E	
90th %ile Green (s)	23.1	58.5	58.5	6.5	41.9	41.9	15.8	32.0	32.0	5.0	21.2	21.2
90th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	22.7	58.5	58.5	6.5	42.3	42.3	15.8	32.0	32.0	5.0	21.2	21.2
70th %ile Term Code	Gap	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	20.7	58.5	58.5	6.5	44.3	44.3	15.8	32.0	32.0	5.0	21.2	21.2
50th %ile Term Code	Gap	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Max	Coord	Coord
30th %ile Green (s)	18.6	58.5	58.5	6.5	46.4	46.4	15.8	32.0	32.0	5.0	21.2	21.2
30th %ile Term Code	Gap	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Max	Coord	Coord
10th %ile Green (s)	15.5	58.5	58.5	6.5	49.5	49.5	15.8	41.5	41.5	0.0	21.2	21.2
10th %ile Term Code	Gap	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	162	316	~819	69	105	0	140	~380	15	17	202	13
Queue Length 95th (ft)	214	388	#1078	#121	132	0	#274	#514	15	36	#281	22
Internal Link Dist (ft)		1021			1100			1418			1649	
Turn Bay Length (ft)				250		400	350			300		
Base Capacity (vph)	630	1708	928	172	1323	686	439	910	537	128	536	417
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.63	1.14	0.99	0.28	0.04	0.99	0.97	0.36	0.33	0.87	0.22

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 112 (93%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.14

Intersection Signal Delay: 58.3

Intersection LOS: E

Intersection Capacity Utilization 87.5%

ICU Level of Service E

Analysis Period (min) 15


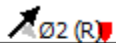



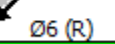


~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.























Queue shown is maximum after two cycles.

Splits and Phases: 240: MLK Jr. Dr.

 Ø1	 Ø2 (R)	 Ø3	 Ø4
9.5 s	36.5 s	11 s	63 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
20.3 s	25.7 s	27.6 s	46.4 s













Synchro Report - Signalized Intersections
250: Old Gordon Rd.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	4	4	4	21	45	20	63	1064	20	8	332	20
Future Volume (vph)	4	4	4	21	45	20	63	1064	20	8	332	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	150		250
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.954				0.850			0.850
Flt Protected		0.976		0.950			0.950			0.950		
Satd. Flow (prot)	0	1818	1583	1770	1777	0	1770	3008	1583	1770	3008	1583
Flt Permitted		0.895		0.624			0.423			0.108		
Satd. Flow (perm)	0	1667	1583	1162	1777	0	788	3008	1583	201	3008	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95		18				95			95
Link Speed (mph)		30		30			30			30		30
Link Distance (ft)		617		886			1729			1350		
Travel Time (s)		14.0		20.1			39.3			30.7		
Peak Hour Factor	0.50	0.50	0.50	0.66	0.94	0.94	0.79	0.84	0.84	0.50	0.81	0.81
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	20%	2%	2%	20%	2%
Adj. Flow (vph)	9	9	9	37	56	25	93	1469	28	19	475	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	18	9	37	81	0	93	1469	28	19	475	29
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm

Synchro Report - Signalized Intersections
250: Old Gordon Rd.

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases		6		5	2		7	4		3	8	
Permitted Phases	6		6	2			4		4	8		8
Detector Phase	6	6	6	5	2		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	23.4	23.4	23.4	9.6	33.0		9.8	77.5	77.5	9.5	77.2	77.2
Total Split (%)	19.5%	19.5%	19.5%	8.0%	27.5%		8.2%	64.6%	64.6%	7.9%	64.3%	64.3%
Maximum Green (s)	18.9	18.9	18.9	5.1	28.5		5.3	73.0	73.0	5.0	72.7	72.7
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Min	C-Min	C-Min	None	C-Min		None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0			0	0		0	0
Act Effect Green (s)		27.7	27.7	34.8	34.8		75.3	72.0	72.0	70.0	64.1	64.1
Actuated g/C Ratio		0.23	0.23	0.29	0.29		0.63	0.60	0.60	0.58	0.53	0.53
v/c Ratio		0.05	0.02	0.10	0.15		0.17	0.81	0.03	0.10	0.30	0.03
Control Delay		47.0	0.0	37.6	29.8		1.9	8.2	0.0	6.8	15.2	0.1
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		47.0	0.0	37.6	29.8		1.9	8.2	0.0	6.8	15.2	0.1
LOS		D	A	D	C		A	A	A	A	B	A
Approach Delay		31.3			32.3			7.7			14.1	
Approach LOS		C			C			A			B	
90th %ile Green (s)	8.9	8.9	8.9	6.2	19.6		8.3	80.7	80.7	6.2	78.6	78.6
90th %ile Term Code	Coord	Coord	Coord	Max	Coord		Gap	Gap	Gap	Gap	Hold	Hold
70th %ile Green (s)	14.7	14.7	14.7	8.4	27.6		8.1	72.8	72.8	6.1	70.8	70.8
70th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Gap	Gap	Gap	Gap	Hold	Hold
50th %ile Green (s)	26.7	26.7	26.7	7.2	38.4		8.1	72.6	72.6	0.0	60.0	60.0
50th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Gap	Gap	Gap	Skip	Hold	Hold
30th %ile Green (s)	40.9	40.9	40.9	0.0	40.9		7.4	70.1	70.1	0.0	58.2	58.2
30th %ile Term Code	Coord	Coord	Coord	Skip	Coord		Gap	Gap	Gap	Skip	Hold	Hold
10th %ile Green (s)	47.3	47.3	47.3	0.0	47.3		6.3	63.7	63.7	0.0	52.9	52.9
10th %ile Term Code	Coord	Coord	Coord	Skip	Coord		Gap	Gap	Gap	Skip	Hold	Hold
Queue Length 50th (ft)		11	0	20	34		5	47	0	6	111	0
Queue Length 95th (ft)		21	0	41	91		m3	m47	m0	5	85	0
Internal Link Dist (ft)		537			806			1649			1270	
Turn Bay Length (ft)							150			150		250
Base Capacity (vph)		424	473	370	556		556	1868	1019	194	1852	1011
Starvation Cap Reductn		0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio		0.04	0.02	0.10	0.15		0.17	0.79	0.03	0.10	0.26	0.03

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 112 (93%), Referenced to phase 2:NWTL and 6:SETL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 10.7

Intersection LOS: B





Intersection Capacity Utilization 57.6%

ICU Level of Service B

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.







Splits and Phases: 250: Old Gordon Rd.

 Ø2 (L)	 Ø3	 Ø4
33 s	9.5 s	77.5 s
 Ø5	 Ø7	 Ø8
9.6 s	23.4 s	77.2 s

Synchro Report - Signalized Intersections
270: Fulton Ind. Blvd & UPS Drive

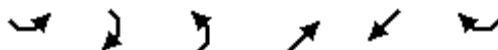
Future 2031 - AM
06/27/2021



Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	102	102	200	800	350	0
Future Volume (vph)	102	102	200	800	350	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	0.850					
Flt Protected	0.950	0.950				
Satd. Flow (prot)	902	808	950	3008	3008	1863
Flt Permitted	0.950	0.408				
Satd. Flow (perm)	902	808	408	3008	3008	1863
Right Turn on Red	Yes					Yes
Satd. Flow (RTOR)	129					
Link Speed (mph)	30	30			30	
Link Distance (ft)	912	1889			1254	
Travel Time (s)	20.7	42.9			28.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	100%	100%	90%	20%	20%	2%
Adj. Flow (vph)	129	129	252	1009	441	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	129	129	252	1009	441	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12	12			12	
Link Offset(ft)	0	0			0	
Crosswalk Width(ft)	16	16			16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9		
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4	5		2	6	
Permitted Phases	4		2	6		
Detector Phase	4	4	5	2	6	6

Synchro Report - Signalized Intersections
270: Fulton Ind. Blvd & UPS Drive

Future 2031 - AM
06/27/2021



Lane Group	SEL	SER	NEL	NET	SWT	SWR
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	26.0	51.0	25.0	25.0
Total Split (%)	32.0%	32.0%	34.7%	68.0%	33.3%	33.3%
Maximum Green (s)	19.5	19.5	21.5	46.5	20.5	20.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effect Green (s)	15.0	15.0	51.0	51.0	31.6	
Actuated g/C Ratio	0.20	0.20	0.68	0.68	0.42	
v/c Ratio	0.72	0.49	0.65	0.49	0.35	
Control Delay	49.2	11.5	14.4	7.4	18.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	49.2	11.5	14.4	7.4	18.4	
LOS	D	B	B	A	B	
Approach Delay	30.4			8.8	18.4	
Approach LOS	C			A	B	
90th %ile Green (s)	19.5	19.5	21.5	46.5	20.5	20.5
90th %ile Term Code	Max	Max	Max	Coord	Coord	Coord
70th %ile Green (s)	19.1	19.1	19.3	46.9	23.1	23.1
70th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
50th %ile Green (s)	15.9	15.9	14.7	50.1	30.9	30.9
50th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
30th %ile Green (s)	12.6	12.6	11.2	53.4	37.7	37.7
30th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
10th %ile Green (s)	7.7	7.7	7.9	58.3	45.9	45.9
10th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
Queue Length 50th (ft)	56	0	45	104	72	
Queue Length 95th (ft)	108	42	103	172	136	
Internal Link Dist (ft)	832			1809	1174	
Turn Bay Length (ft)						
Base Capacity (vph)	234	305	432	2047	1268	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.55	0.42	0.58	0.49	0.35	

Intersection Summary

Area Type: Other
Cycle Length: 75

Synchro Report - Signalized Intersections
 270: Fulton Ind. Blvd & UPS Drive

Future 2031 - AM
 06/27/2021

Actuated Cycle Length: 75

Offset: 64 (85%), Referenced to phase 2:NETL and 6:SWT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 13.8

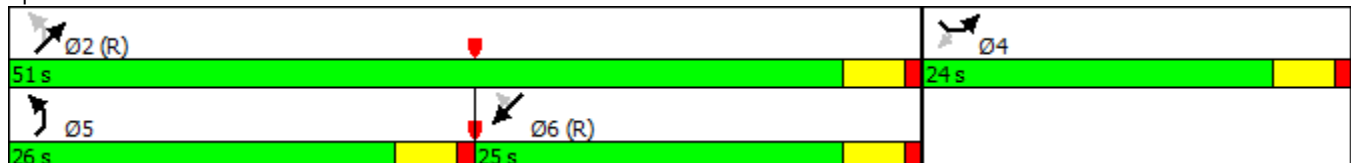
Intersection LOS: B

Intersection Capacity Utilization 41.9%

ICU Level of Service A

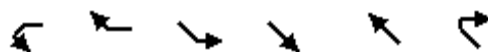
Analysis Period (min) 15

Splits and Phases: 270: Fulton Ind. Blvd & UPS Drive



Synchro Report - Signalized Intersections
280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy

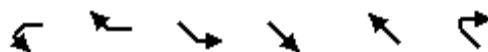
Future 2031 - AM
06/27/2021



Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	45	0	99	1533	741	0
Future Volume (vph)	45	0	99	1533	741	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	300			0
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Fr						
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1863	1570	3139	3139	1652
Flt Permitted	0.950		0.270			
Satd. Flow (perm)	1770	1863	446	3139	3139	1652
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	1300			1130	416	
Travel Time (s)	29.5			25.7	9.5	
Peak Hour Factor	0.72	0.72	0.92	0.92	0.92	0.92
Growth Factor	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	2%	2%	15%	15%	15%	15%
Adj. Flow (vph)	73	0	125	1933	934	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	73	0	125	1933	934	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm

Synchro Report - Signalized Intersections
280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy

Future 2031 - AM
06/27/2021



Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Protected Phases	8		1	6	2	
Permitted Phases		8	6			2
Detector Phase	8	8	1	6	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	12.0	97.5	85.5	85.5
Total Split (%)	18.8%	18.8%	10.0%	81.3%	71.3%	71.3%
Maximum Green (s)	18.0	18.0	7.5	93.0	81.0	81.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effect Green (s)	10.3		102.9	103.8	91.2	
Actuated g/C Ratio	0.09		0.86	0.86	0.76	
v/c Ratio	0.48		0.28	0.71	0.39	
Control Delay	62.2		3.4	6.0	2.9	
Queue Delay	0.4		0.0	0.5	0.1	
Total Delay	62.6		3.4	6.5	3.0	
LOS	E		A	A	A	
Approach Delay	62.6			6.3	3.0	
Approach LOS	E			A	A	
90th %ile Green (s)	14.3	14.3	8.9	96.7	83.3	83.3
90th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
70th %ile Green (s)	12.0	12.0	7.8	99.0	86.7	86.7
70th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
50th %ile Green (s)	10.3	10.3	7.1	100.7	89.1	89.1
50th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
30th %ile Green (s)	8.6	8.6	6.6	102.4	91.3	91.3
30th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
10th %ile Green (s)	0.0	0.0	5.6	115.5	105.4	105.4
10th %ile Term Code	Skip	Skip	Gap	Coord	Coord	Coord
Queue Length 50th (ft)	55		13	244	60	
Queue Length 95th (ft)	80		28	399	12	
Internal Link Dist (ft)	1220			1050	336	
Turn Bay Length (ft)			300			
Base Capacity (vph)	265		455	2714	2384	
Starvation Cap Reductn	0		0	0	280	
Spillback Cap Reductn	44		0	360	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.33		0.27	0.82	0.44	

Intersection Summary






















Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 62 (52%), Referenced to phase 2:NWT and 6:SETL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 6.7 Intersection LOS: A
 Intersection Capacity Utilization 60.8% ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy















Synchro Report - Signalized Intersections
290: Fulton Ind. Blvd & Donald Lee Hollowell Pkwy

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	176	1568	200	88	728	0	60	311	0	49	52	50
Future Volume (vph)	176	1568	200	88	728	0	60	311	0	49	52	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	300		0	300		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850								0.930	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1570	3139	1404	1570	3139	0	1504	3008	0	1570	2919	0
Flt Permitted	0.242			0.059			0.635			0.253		
Satd. Flow (perm)	400	3139	1404	97	3139	0	1005	3008	0	418	2919	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			214								74	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		416			899			1051			1138	
Travel Time (s)		9.5			20.4			23.9			25.9	
Peak Hour Factor	0.80	0.95	0.92	0.92	0.96	0.92	0.83	0.90	0.92	0.72	0.72	0.78
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	15%	15%	15%	15%	15%	15%	20%	20%	20%	15%	15%	15%
Adj. Flow (vph)	255	1915	252	111	880	0	84	401	0	79	84	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	255	1915	252	111	880	0	84	401	0	79	158	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	

Synchro Report - Signalized Intersections
290: Fulton Ind. Blvd & Donald Lee Hollowell Pkwy

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2			4			8		
Detector Phase	1	6	6	5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.6	78.2	78.2	9.8	63.4		9.5	22.5		9.5	22.5	
Total Split (%)	20.5%	65.2%	65.2%	8.2%	52.8%		7.9%	18.8%		7.9%	18.8%	
Maximum Green (s)	20.1	73.7	73.7	5.3	58.9		5.0	18.0		5.0	18.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)		11.0	11.0		11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effect Green (s)	84.6	75.2	75.2	74.5	68.5		21.8	17.8		21.8	17.8	
Actuated g/C Ratio	0.70	0.63	0.63	0.62	0.57		0.18	0.15		0.18	0.15	
v/c Ratio	0.63	0.97	0.26	0.83	0.49		0.41	0.90		0.64	0.32	
Control Delay	13.7	33.5	2.4	71.9	11.2		46.4	74.4		63.5	26.0	
Queue Delay	0.1	14.9	0.4	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	13.8	48.4	2.8	71.9	11.2		46.4	74.4		63.5	26.0	
LOS	B	D	A	E	B		D	E		E	C	
Approach Delay		40.0			18.0			69.5			38.5	
Approach LOS		D			B			E			D	
90th %ile Green (s)	17.3	73.7	73.7	5.3	61.7		5.0	18.0		5.0	18.0	
90th %ile Term Code	Gap	Coord	Coord	Max	Coord		Max	Max		Max	Hold	
70th %ile Green (s)	14.1	73.7	73.7	5.3	64.9		5.0	18.0		5.0	18.0	
70th %ile Term Code	Gap	Coord	Coord	Max	Coord		Max	Max		Max	Hold	
50th %ile Green (s)	12.5	73.7	73.7	5.3	66.5		5.0	18.0		5.0	18.0	
50th %ile Term Code	Gap	Coord	Coord	Max	Coord		Max	Max		Max	Hold	
30th %ile Green (s)	11.1	73.7	73.7	5.3	67.9		5.0	18.0		5.0	18.0	
30th %ile Term Code	Gap	Coord	Coord	Max	Coord		Max	Max		Max	Hold	
10th %ile Green (s)	8.0	81.0	81.0	8.6	81.6		0.0	16.9		0.0	16.9	
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Skip	Gap		Skip	Hold	
Queue Length 50th (ft)	42	733	12	47	93		53	162		50	30	
Queue Length 95th (ft)	90	#941	m34	#165	253		92	#252		74	44	
Internal Link Dist (ft)		336			819			971			1058	
Turn Bay Length (ft)	200		200	300			300			200		
Base Capacity (vph)	481	1965	959	133	1792		203	451		124	500	
Starvation Cap Reductn	8	113	348	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.54	1.03	0.41	0.83	0.49		0.41	0.89		0.64	0.32	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 54 (45%), Referenced to phase 2:NWTL and 6:SETL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 38.1

Intersection LOS: D

Intersection Capacity Utilization 85.1%

ICU Level of Service E









Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 290: Fulton Ind. Blvd & Donald Lee Hollowell Pkwy

 Ø1	 Ø2 (R)	 Ø3	 Ø4
24.6 s	63.4 s	9.5 s	22.5 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
9.8 s	78.2 s	9.5 s	22.5 s













Synchro Report - Signalized Intersections
300: Bolton Rd & Donald Lee Hollowell Pkwy

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	8	1234	31	38	1038	14	13	31	62	18	14	12
Future Volume (vph)	8	1234	31	38	1038	14	13	31	62	18	14	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.998			0.921			0.964	
Flt Protected	0.950			0.950				0.994			0.980	
Satd. Flow (prot)	1444	3082	0	1719	3191	0	0	1696	0	0	1699	0
Flt Permitted	0.163			0.131				0.963			0.571	
Satd. Flow (perm)	248	3082	0	237	3191	0	0	1643	0	0	990	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			2			50			13	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		899			304			783			722	
Travel Time (s)		20.4			6.9			17.8			16.4	
Peak Hour Factor	0.98	0.98	0.98	0.85	0.85	0.85	0.93	0.93	0.93	0.72	0.72	0.72
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	25%	17%	3%	5%	13%	7%	2%	2%	3%	11%	2%	2%
Adj. Flow (vph)	9	1461	37	52	1417	19	16	39	77	29	23	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	1498	0	52	1436	0	0	132	0	0	71	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	

Synchro Report - Signalized Intersections
300: Bolton Rd & Donald Lee Hollowell Pkwy

Future 2031 - AM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	10.0	85.0		11.0	86.0		24.0	24.0		24.0	24.0	
Total Split (%)	8.3%	70.8%		9.2%	71.7%		20.0%	20.0%		20.0%	20.0%	
Maximum Green (s)	5.5	80.5		6.5	81.5		19.5	19.5		19.5	19.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	95.4	90.8		98.8	97.4			11.5			11.5	
Actuated g/C Ratio	0.80	0.76		0.82	0.81			0.10			0.10	
v/c Ratio	0.04	0.64		0.19	0.55			0.65			0.67	
Control Delay	1.4	5.0		3.3	6.6			46.5			70.5	
Queue Delay	0.0	0.4		0.0	0.4			0.9			1.5	
Total Delay	1.4	5.4		3.3	7.0			47.5			72.0	
LOS	A	A		A	A			D			E	
Approach Delay		5.3			6.9			47.5			72.0	
Approach LOS		A			A			D			E	
90th %ile Green (s)	6.0	81.9		7.1	83.0		17.5	17.5		17.5	17.5	
90th %ile Term Code	Gap	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
70th %ile Green (s)	0.0	86.1		6.5	97.1		13.9	13.9		13.9	13.9	
70th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	0.0	88.9		6.1	99.5		11.5	11.5		11.5	11.5	
50th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	0.0	91.6		5.8	101.9		9.1	9.1		9.1	9.1	
30th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	0.0	105.5		0.0	105.5		5.5	5.5		5.5	5.5	
10th %ile Term Code	Skip	Coord		Skip	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)	1	160		2	25			61			44	
Queue Length 95th (ft)	m1	m9		m12	m526			122			69	
Internal Link Dist (ft)		819			224			703			642	
Turn Bay Length (ft)	400			150								
Base Capacity (vph)	253	2333		276	2590			308			171	
Starvation Cap Reductn	0	0		0	565			0			0	
Spillback Cap Reductn	0	323		0	0			53			29	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.04	0.75		0.19	0.71			0.52			0.50	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 68 (57%), Referenced to phase 2:NWTL and 6:SETL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 9.3

Intersection LOS: A







Intersection Capacity Utilization 55.6%

ICU Level of Service B

Analysis Period (min) 15

















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 300: Bolton Rd & Donald Lee Hollowell Pkwy

 Ø1	 Ø2 (R)	 Ø4
10 s	86 s	24 s
 Ø5	 Ø6 (R)	 Ø8
11 s	85 s	24 s












Synchro Report - Signalized Intersections
310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp

Future 2031 - AM
06/27/2021

											
Lane Group	NBL	NBR	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR
Lane Configurations											
Traffic Volume (vph)	0	0	0	843	526	158	636	0	76	0	419
Future Volume (vph)	0	0	0	843	526	158	636	0	76	0	419
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00
Fr't				0.942							0.850
Flt Protected						0.950			0.950		
Satd. Flow (prot)	0	0	0	3012	0	1262	3252	0	2736	0	1417
Flt Permitted						0.061			0.950		
Satd. Flow (perm)	0	0	0	3012	0	81	3252	0	2736	0	1417
Right Turn on Red					Yes			Yes			Yes
Satd. Flow (RTOR)				165							240
Link Speed (mph)	30			30			30			30	
Link Distance (ft)	922			304			568			593	
Travel Time (s)	21.0			6.9			12.9			13.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.87	0.87	0.87
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	2%	2%	2%	11%	16%	43%	11%	2%	28%	2%	14%
Adj. Flow (vph)	0	0	0	1063	663	191	769	0	101	0	559
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	0	1726	0	191	769	0	101	0	559
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			24			24			24	
Link Offset(ft)	0			0			0			0	
Crosswalk Width(ft)	16			16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15		9	15		9	15	15	9
Number of Detectors				2		1	2		1		1
Detector Template				Thru		Left	Thru		Left		Right
Leading Detector (ft)				100		20	100		20		20
Trailing Detector (ft)				0		0	0		0		0
Detector 1 Position(ft)				0		0	0		0		0
Detector 1 Size(ft)				6		20	6		20		20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)				0.0		0.0	0.0		0.0		0.0
Detector 1 Queue (s)				0.0		0.0	0.0		0.0		0.0
Detector 1 Delay (s)				0.0		0.0	0.0		0.0		0.0
Detector 2 Position(ft)				94			94				
Detector 2 Size(ft)				6			6				
Detector 2 Type				Cl+Ex			Cl+Ex				
Detector 2 Channel											
Detector 2 Extend (s)				0.0			0.0				
Turn Type				NA		pm+pt	NA		Prot		Perm
Protected Phases				6		5	2		3		
Permitted Phases						2					8
Detector Phase				6		5	2		3		8

Synchro Report - Signalized Intersections
310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp

Future 2031 - AM
06/27/2021

											
Lane Group	NBL	NBR	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR
Switch Phase											
Minimum Initial (s)				5.0		5.0	5.0		5.0		5.0
Minimum Split (s)				22.5		9.5	22.5		9.5		22.5
Total Split (s)				65.6		18.4	84.0		36.0		36.0
Total Split (%)				54.7%		15.3%	70.0%		30.0%		30.0%
Maximum Green (s)				61.1		13.9	79.5		31.5		31.5
Yellow Time (s)				3.5		3.5	3.5		3.5		3.5
All-Red Time (s)				1.0		1.0	1.0		1.0		1.0
Lost Time Adjust (s)				0.0		0.0	0.0		0.0		0.0
Total Lost Time (s)				4.5		4.5	4.5		4.5		4.5
Lead/Lag				Lag		Lead					
Lead-Lag Optimize?				Yes		Yes					
Vehicle Extension (s)				3.0		3.0	3.0		3.0		3.0
Recall Mode				C-Min		None	C-Min		None		None
Walk Time (s)				7.0			7.0				7.0
Flash Dont Walk (s)				11.0			11.0				11.0
Pedestrian Calls (#/hr)				0			0				0
Act Effect Green (s)				61.1		79.5	79.5		31.5		31.5
Actuated g/C Ratio				0.51		0.66	0.66		0.26		0.26
v/c Ratio				1.07		1.01	0.36		0.14		1.02
Control Delay				60.1		99.7	6.9		34.6		69.2
Queue Delay				0.5		0.0	0.0		0.0		9.9
Total Delay				60.7		99.7	7.0		34.6		79.1
LOS				E		F	A		C		E
Approach Delay				60.7			25.4			72.3	
Approach LOS				E			C			E	
90th %ile Green (s)				61.1		13.9	79.5		31.5		31.5
90th %ile Term Code				Coord		Max	Coord		Hold		Max
70th %ile Green (s)				61.1		13.9	79.5		31.5		31.5
70th %ile Term Code				Coord		Max	Coord		Hold		Max
50th %ile Green (s)				61.1		13.9	79.5		31.5		31.5
50th %ile Term Code				Coord		Max	Coord		Hold		Max
30th %ile Green (s)				61.1		13.9	79.5		31.5		31.5
30th %ile Term Code				Coord		Max	Coord		Hold		Max
10th %ile Green (s)				61.1		13.9	79.5		31.5		31.5
10th %ile Term Code				Coord		Max	Coord		Hold		Max
Queue Length 50th (ft)				~736		~123	143		30		~311
Queue Length 95th (ft)				#871		m#237	127		52		#497
Internal Link Dist (ft)	842			224			488			513	
Turn Bay Length (ft)											
Base Capacity (vph)				1614		190	2154		718		548
Starvation Cap Reductn				2		0	0		0		0
Spillback Cap Reductn				0		0	228		0		16
Storage Cap Reductn				0		0	0		0		0
Reduced v/c Ratio				1.07		1.01	0.40		0.14		1.05
Intersection Summary											
Area Type:	Other										
Cycle Length: 120											

Synchro Report - Signalized Intersections
 310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp

Future 2031 - AM
 06/27/2021

Actuated Cycle Length: 120

Offset: 62 (52%), Referenced to phase 2:NWTL and 6:SET, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 52.9

Intersection LOS: D

Intersection Capacity Utilization 64.2%

ICU Level of Service C

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

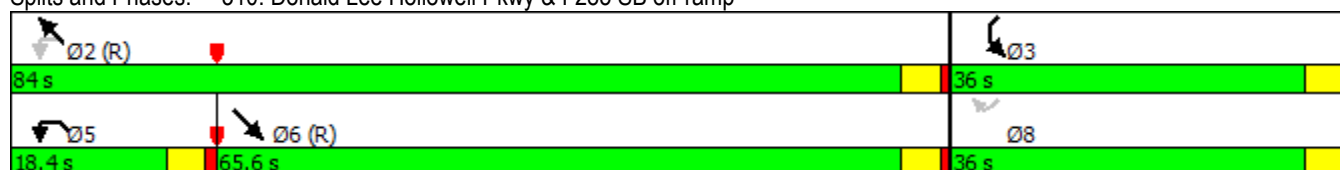
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp














Synchro Report - Signalized Intersections
320: I-285 NB off-ramp & Donald Lee Hollowell Pkwy

Future 2031 - AM
06/27/2021

											
Lane Group	SBL	SBR	SEL	SET	SER	NWL	NWT	NWR	NEL2	NEL	NER
Lane Configurations											
Traffic Volume (vph)	0	0	443	477	0	0	352	133	451	0	206
Future Volume (vph)	0	0	443	477	0	0	352	133	451	0	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	300		0	0		0		0	0
Storage Lanes	0	0	1		0	0		0		2	1
Taper Length (ft)	25		25			25				25	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt							0.959				0.850
Flt Protected			0.950						0.950		
Satd. Flow (prot)	0	0	1504	3167	0	0	3874	0	3127	0	1335
Flt Permitted			0.280						0.950		
Satd. Flow (perm)	0	0	443	3167	0	0	3874	0	3127	0	1335
Right Turn on Red					Yes			Yes			Yes
Satd. Flow (RTOR)							74				347
Link Speed (mph)	30			30			30			30	
Link Distance (ft)	782			568			1114			887	
Travel Time (s)	17.8			12.9			25.3			20.2	
Peak Hour Factor	0.92	0.92	0.90	0.90	0.90	0.83	0.83	0.83	0.94	0.94	0.94
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	2%	2%	20%	14%	2%	2%	24%	40%	12%	2%	21%
Adj. Flow (vph)	0	0	571	615	0	0	492	186	557	0	254
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	571	615	0	0	678	0	557	0	254
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			12			12			24	
Link Offset(ft)	0			0			0			0	
Crosswalk Width(ft)	16			16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15		9	15		9	15	15	9
Number of Detectors			1	2			2		1		1
Detector Template			Left	Thru			Thru		Left		Right
Leading Detector (ft)			20	100			100		20		20
Trailing Detector (ft)			0	0			0		0		0
Detector 1 Position(ft)			0	0			0		0		0
Detector 1 Size(ft)			20	6			6		20		20
Detector 1 Type			Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex		Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)			0.0	0.0			0.0		0.0		0.0
Detector 1 Queue (s)			0.0	0.0			0.0		0.0		0.0
Detector 1 Delay (s)			0.0	0.0			0.0		0.0		0.0
Detector 2 Position(ft)				94			94				
Detector 2 Size(ft)				6			6				
Detector 2 Type				Cl+Ex			Cl+Ex				
Detector 2 Channel											
Detector 2 Extend (s)				0.0			0.0				
Turn Type			pm+pt	NA			NA		Prot		Perm

Synchro Report - Signalized Intersections
320: I-285 NB off-ramp & Donald Lee Hollowell Pkwy

Future 2031 - AM
06/27/2021

											
Lane Group	SBL	SBR	SEL	SET	SER	NWL	NWT	NWR	NEL2	NEL	NER
Protected Phases			5	2			6		3		
Permitted Phases			2								3
Detector Phase			5	2			6		3		3
Switch Phase											
Minimum Initial (s)			5.0	5.0			5.0		5.0		5.0
Minimum Split (s)			9.5	22.5			22.5		9.5		9.5
Total Split (s)			56.0	88.0			32.0		32.0		32.0
Total Split (%)			46.7%	73.3%			26.7%		26.7%		26.7%
Maximum Green (s)			51.5	83.5			27.5		27.5		27.5
Yellow Time (s)			3.5	3.5			3.5		3.5		3.5
All-Red Time (s)			1.0	1.0			1.0		1.0		1.0
Lost Time Adjust (s)			0.0	0.0			0.0		0.0		0.0
Total Lost Time (s)			4.5	4.5			4.5		4.5		4.5
Lead/Lag			Lead				Lag				
Lead-Lag Optimize?			Yes				Yes				
Vehicle Extension (s)			3.0	3.0			3.0		3.0		3.0
Recall Mode			Min	C-Min			C-Min		None		None
Walk Time (s)				7.0			7.0				
Flash Dont Walk (s)				11.0			11.0				
Pedestrian Calls (#/hr)				0			0				
Act Effect Green (s)			85.6	85.6			42.0		25.4		25.4
Actuated g/C Ratio			0.71	0.71			0.35		0.21		0.21
v/c Ratio			0.86	0.27			0.48		0.84		0.46
Control Delay			14.2	1.3			31.2		57.5		3.2
Queue Delay			0.4	0.0			0.0		0.0		0.0
Total Delay			14.6	1.3			31.2		57.5		3.2
LOS			B	A			C		E		A
Approach Delay				7.7			31.2			40.5	
Approach LOS				A			C			D	
90th %ile Green (s)			51.5	83.5			27.5		27.5		27.5
90th %ile Term Code			Max	Coord			Coord		Max		Max
70th %ile Green (s)			47.8	82.8			30.5		28.2		28.2
70th %ile Term Code			Gap	Coord			Coord		Max		Max
50th %ile Green (s)			41.0	83.8			38.3		27.2		27.2
50th %ile Term Code			Gap	Coord			Coord		Gap		Gap
30th %ile Green (s)			33.2	87.0			49.3		24.0		24.0
30th %ile Term Code			Gap	Coord			Coord		Gap		Gap
10th %ile Green (s)			21.8	90.7			64.4		20.3		20.3
10th %ile Term Code			Gap	Coord			Coord		Gap		Gap
Queue Length 50th (ft)			82	10			139		210		0
Queue Length 95th (ft)			m58	m18			186		275		7
Internal Link Dist (ft)	702			488			1034			807	
Turn Bay Length (ft)			300								
Base Capacity (vph)			771	2261			1403		720		574
Starvation Cap Reductn			30	0			0		0		0
Spillback Cap Reductn			0	0			0		0		0
Storage Cap Reductn			0	0			0		0		0
Reduced v/c Ratio			0.77	0.27			0.48		0.77		0.44

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 18 (15%), Referenced to phase 2:SETL and 6:NWT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 23.6

Intersection LOS: C

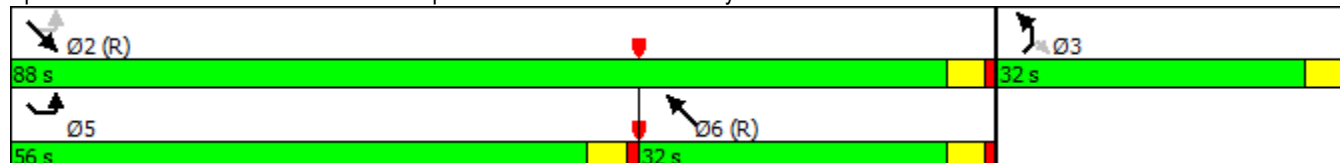
Intersection Capacity Utilization 64.2%

ICU Level of Service C

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 320: I-285 NB off-ramp & Donald Lee Hollowell Pkwy


























2031 PM Synchro Analysis Report

Synchro Report - Signalized Intersections
 10: Cascade Palmetto Hwy/Fulton Ind. Blvd. & Campbellton Rd.













Future - 2031 PM

06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	165	332	92	89	465	18	96	301	90	93	621	535
Future Volume (vph)	165	332	92	89	465	18	96	301	90	93	621	535
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	300		0	400		400	300		300
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.994				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1810	1482	1752	1761	0	1805	3438	1568	1327	2983	1468
Flt Permitted	0.111			0.324			0.223			0.407		
Satd. Flow (perm)	205	1810	1482	598	1761	0	424	3438	1568	569	2983	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			116		2				115			276
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		808			851			3037			3592	
Travel Time (s)		18.4			19.3			69.0			81.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	3%	5%	9%	3%	7%	13%	0%	5%	3%	36%	21%	10%
Adj. Flow (vph)	208	419	116	112	586	23	121	380	113	117	783	675
Shared Lane Traffic (%)												
Lane Group Flow (vph)	208	419	116	112	609	0	121	380	113	117	783	675
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm

Synchro Report - Signalized Intersections
 10: Cascade Palmetto Hwy/Fulton Ind. Blvd. & Campbellton Rd.

Future - 2031 PM
 06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	13.6	40.3	40.3	11.3	38.0		9.6	34.8	34.8	13.6	38.8	38.8
Total Split (%)	13.6%	40.3%	40.3%	11.3%	38.0%		9.6%	34.8%	34.8%	13.6%	38.8%	38.8%
Maximum Green (s)	9.1	35.8	35.8	6.8	33.5		5.1	30.3	30.3	9.1	34.3	34.3
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes				Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effect Green (s)	45.0	35.9	35.9	40.2	33.5		35.8	30.7	30.7	43.0	34.3	34.3
Actuated g/C Ratio	0.45	0.36	0.36	0.40	0.34		0.36	0.31	0.31	0.43	0.34	0.34
v/c Ratio	0.90	0.65	0.19	0.35	1.03		0.55	0.36	0.20	0.38	0.77	0.99
Control Delay	60.5	32.4	5.1	18.6	79.1		28.4	28.3	5.8	21.2	35.2	52.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.5	32.4	5.1	18.6	79.1		28.4	28.3	5.8	21.2	35.2	52.1
LOS	E	C	A	B	E		C	C	A	C	D	D
Approach Delay		36.0			69.7			24.2			41.4	
Approach LOS		D			E			C			D	
90th %ile Green (s)	9.1	35.8	35.8	6.8	33.5		5.1	30.3	30.3	9.1	34.3	34.3
90th %ile Term Code	Max	Max	Max	Max	Max		Max	Hold	Hold	Max	Max	Max
70th %ile Green (s)	9.1	35.8	35.8	6.8	33.5		5.1	30.3	30.3	9.1	34.3	34.3
70th %ile Term Code	Max	Hold	Hold	Max	Max		Max	Hold	Hold	Max	Max	Max
50th %ile Green (s)	9.1	35.8	35.8	6.8	33.5		5.1	30.3	30.3	9.1	34.3	34.3
50th %ile Term Code	Max	Hold	Hold	Max	Max		Max	Hold	Hold	Max	Max	Max
30th %ile Green (s)	9.1	35.8	35.8	6.8	33.5		5.1	30.3	30.3	9.1	34.3	34.3
30th %ile Term Code	Max	Hold	Hold	Max	Max		Max	Hold	Hold	Max	Max	Max
10th %ile Green (s)	9.1	36.2	36.2	6.4	33.5		5.1	32.5	32.5	6.9	34.3	34.3
10th %ile Term Code	Max	Hold	Hold	Gap	Max		Max	Hold	Hold	Gap	Max	Max
Queue Length 50th (ft)	81	220	0	39	~418		45	99	0	45	231	285
Queue Length 95th (ft)	#216	327	36	71	#634		81	141	38	83	305	#539
Internal Link Dist (ft)		728			771			2957			3512	
Turn Bay Length (ft)	300		300	300			400		400	300		300
Base Capacity (vph)	232	649	606	319	591		222	1056	561	315	1023	684
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.65	0.19	0.35	1.03		0.55	0.36	0.20	0.37	0.77	0.99

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.03

Intersection Signal Delay: 43.0

Intersection LOS: D

Intersection Capacity Utilization 85.5%

ICU Level of Service E

Analysis Period (min) 15

90th %ile Actuated Cycle: 100

70th %ile Actuated Cycle: 100

50th %ile Actuated Cycle: 100

30th %ile Actuated Cycle: 100

10th %ile Actuated Cycle: 100









~ Volume exceeds capacity, queue is theoretically infinite.








Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 10: Cascade Palmetto Hwy/Fulton Ind. Blvd. & Campbellton Rd.

 Ø1	 Ø2	 Ø3	 Ø4
13.6 s	34.8 s	11.3 s	40.3 s
 Ø5	 Ø6	 Ø7	 Ø8
9.6 s	38.8 s	13.6 s	38 s








Intersection							
Int Delay, s/veh	107.1						
Movement	SEL	SER	NEL	NET	SWU	SWT	SWR
Lane Configurations							
Traffic Vol, veh/h	79	70	16	487	16	1246	39
Future Vol, veh/h	79	70	16	487	16	1246	39
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	-	Yield
Storage Length	0	100	150	-	150	-	150
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	68	68	92	92	74	74	74
Heavy Vehicles, %	10	17	13	13	6	3	28
Mvmt Flow	135	119	20	614	25	1953	61

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2350	977	1953
Stage 1	2003	-	-
Stage 2	347	-	-
Critical Hdwy	7	7.24	4.36
Critical Hdwy Stg 1	6	-	-
Critical Hdwy Stg 2	6	-	-
Follow-up Hdwy	3.6	3.47	2.33
Pot Cap-1 Maneuver	~ 27	224	256
Stage 1	~ 82	-	-
Stage 2	664	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	~ 25	224	256
Mov Cap-2 Maneuver	~ 25	-	-
Stage 1	~ 82	-	-
Stage 2	612	-	-

Approach	SE	NE	SW
HCM Control Delay, s \$	1231	0.6	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SELn2	SWU	SWT	SWR
Capacity (veh/h)	256	-	25	224	730	-	-
HCM Lane V/C Ratio	0.079	-	5.391	0.533	0.034	-	-
HCM Control Delay (s)	20.3	\$	2288.1	38	10.1	-	-
HCM Lane LOS	C	-	F	E	B	-	-
HCM 95th %tile Q(veh)	0.3	-	16.7	2.8	0.1	-	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection							
Int Delay, s/veh	90.4						
Movement	SEL	SER	NEL	NET	SWU	SWT	SWR
Lane Configurations							
Traffic Vol, veh/h	71	73	10	484	4	1369	76
Future Vol, veh/h	71	73	10	484	4	1369	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	-	None
Storage Length	0	100	150	-	150	-	150
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	58	58	85	85	93	93	93
Heavy Vehicles, %	28	10	10	16	25	5	50
Mvmt Flow	142	146	14	661	5	1708	95

Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	2076	854	1708	0	482	-	0
Stage 1	1718	-	-	-	-	-	-
Stage 2	358	-	-	-	-	-	-
Critical Hdwy	7.36	7.1	4.3	-	6.9	-	-
Critical Hdwy Stg 1	6.36	-	-	-	-	-	-
Critical Hdwy Stg 2	6.36	-	-	-	-	-	-
Follow-up Hdwy	3.78	3.4	2.3	-	2.75	-	-
Pot Cap-1 Maneuver	~ 34	286	334	-	621	-	-
Stage 1	~ 99	-	-	-	-	-	-
Stage 2	607	-	-	-	-	-	-
Platoon blocked, %				-		-	-
Mov Cap-1 Maneuver	~ 33	286	334	-	621	-	-
Mov Cap-2 Maneuver	~ 33	-	-	-	-	-	-
Stage 1	~ 99	-	-	-	-	-	-
Stage 2	582	-	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	868.7	0.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SELn2	SWU	SWT	SWR
Capacity (veh/h)	334	-	33	286	621	-	-
HCM Lane V/C Ratio	0.041	-	4.303	0.51	0.008	-	-
HCM Control Delay (s)	16.2	\$	1731.1	30	10.8	-	-
HCM Lane LOS	C	-	F	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	16.8	2.7	0	-	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM2010 Report - Unsignalized Intersections
 30: Fulton Industrial Blvd. & Riverside Dr./Tradewater Pkwy

Future - 2031 PM
 06/27/2021

Intersection												
Int Delay, s/veh	258											
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↔	↔		↔		↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	50	44	131	58	14	54	19	590	70	60	1086	38
Future Vol, veh/h	50	44	131	58	14	54	19	590	70	60	1086	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	300	-	200	300	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	91	91	91	86	86	86	89	89	89
Heavy Vehicles, %	26	0	13	7	7	4	42	12	1	2	8	40
Mvmt Flow	74	65	195	74	18	69	26	796	94	78	1415	50

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2030	2419	708	1744	2419	398	1415	0	0	796	0	0
Stage 1	1572	1572	-	847	847	-	-	-	-	-	-	-
Stage 2	458	847	-	897	1572	-	-	-	-	-	-	-
Critical Hdwy	8.02	6.5	7.16	7.64	6.64	6.98	4.94	-	-	4.14	-	-
Critical Hdwy Stg 1	7.02	5.5	-	6.64	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.02	5.5	-	6.64	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.76	4	3.43	3.57	4.07	3.34	2.62	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 25	~ 33	353	~ 52	30	596	316	-	-	822	-	-
Stage 1	91	172	-	313	365	-	-	-	-	-	-	-
Stage 2	493	381	-	291	161	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 8	~ 27	353	-	25	596	316	-	-	822	-	-
Mov Cap-2 Maneuver	~ 8	~ 27	-	-	25	-	-	-	-	-	-	-
Stage 1	84	156	-	287	335	-	-	-	-	-	-	-
Stage 2	379	350	-	~ 69	146	-	-	-	-	-	-	-





















Approach	SE	NW	NE	SW
HCM Control Delay, \$ 2274.1			0.5	0.5
HCM LOS	F	-		

Minor Lane/Major Mvmt	NEL	NET	NERNWLn1	SELn1	SELn2	SWL	SWT	SWR
Capacity (veh/h)	316	-	-	-	12	353	822	-
HCM Lane V/C Ratio	0.081	-	-	-	11.65	0.552	0.095	-
HCM Control Delay (s)	17.4	-	-	\$ 5405.6	27.1	9.8	-	-
HCM Lane LOS	C	-	-	F	D	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-	18.8	3.2	0.3	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

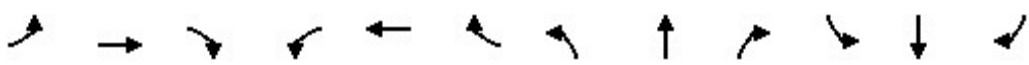
Synchro Report - Signalized Intersections
60: Fulton Ind. Blvd. & Boat Rock Blvd./Boat Rock Rd.

Future - 2031 PM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	50	50	50	42	50	100	679	50	126	957	100
Future Volume (vph)	100	50	50	50	42	50	100	679	50	126	957	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	300		150
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.925			0.952			0.990				0.850
Flt Protected	0.950				0.983		0.950			0.950		
Satd. Flow (prot)	1128	1098	0	0	1482	0	1128	2978	0	1504	3008	897
Flt Permitted	0.478				0.836		0.116			0.214		
Satd. Flow (perm)	568	1098	0	0	1260	0	138	2978	0	339	3008	897
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		58			27			11				127
Link Speed (mph)		30			30			30				30
Link Distance (ft)		812			1105			708			889	
Travel Time (s)		18.5			25.1			16.1			20.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	60%	60%	60%	20%	20%	20%	60%	20%	20%	20%	20%	80%
Adj. Flow (vph)	126	63	63	63	53	63	126	856	63	159	1207	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	126	126	0	0	179	0	126	919	0	159	1207	126
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm

Synchro Report - Signalized Intersections
60: Fulton Ind. Blvd. & Boat Rock Blvd./Boat Rock Rd.








Future - 2031 PM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	22.5
Total Split (s)	10.0	32.5		22.5	22.5		12.0	44.9		12.6	45.5	45.5
Total Split (%)	11.1%	36.1%		25.0%	25.0%		13.3%	49.9%		14.0%	50.6%	50.6%
Maximum Green (s)	5.5	28.0		18.0	18.0		7.5	40.4		8.1	41.0	41.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Min		Min	Min		None	Min		None	Min	Min
Walk Time (s)		7.0		7.0	7.0			7.0			7.0	7.0
Flash Dont Walk (s)		11.0		11.0	11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)		0		0	0			0			0	0
Act Effct Green (s)	21.8	21.8			14.3		46.3	38.5		46.6	38.7	38.7
Actuated g/C Ratio	0.27	0.27			0.17		0.56	0.47		0.57	0.47	0.47
v/c Ratio	0.67	0.38			0.74		0.74	0.65		0.52	0.85	0.26
Control Delay	44.1	17.7			47.7		43.6	20.4		14.7	27.6	4.3
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	44.1	17.7			47.7		43.6	20.4		14.7	27.6	4.3
LOS	D	B			D		D	C		B	C	A
Approach Delay		30.9			47.7			23.2			24.3	
Approach LOS		C			D			C			C	
90th %ile Green (s)	5.5	28.0		18.0	18.0		7.5	40.4		8.1	41.0	41.0
90th %ile Term Code	Max	Hold		Max	Max		Max	Max		Max	Max	Max
70th %ile Green (s)	5.5	28.0		18.0	18.0		7.5	40.4		8.1	41.0	41.0
70th %ile Term Code	Max	Hold		Max	Max		Max	Hold		Max	Max	Max
50th %ile Green (s)	5.5	26.0		16.0	16.0		7.5	40.4		8.1	41.0	41.0
50th %ile Term Code	Max	Hold		Gap	Gap		Max	Hold		Max	Max	Max
30th %ile Green (s)	5.5	22.7		12.7	12.7		7.5	39.6		8.1	40.2	40.2
30th %ile Term Code	Max	Hold		Gap	Gap		Max	Hold		Max	Gap	Gap
10th %ile Green (s)	0.0	8.1		8.1	8.1		7.5	30.3		6.5	29.3	29.3
10th %ile Term Code	Skip	Hold		Gap	Gap		Max	Hold		Gap	Gap	Gap
Queue Length 50th (ft)	55	28			80		30	199		36	302	0
Queue Length 95th (ft)	#111	75			#165		#132	279		68	#456	31
Internal Link Dist (ft)		732			1025			628			809	
Turn Bay Length (ft)							300			300		150
Base Capacity (vph)	189	422			305		170	1512		312	1544	522
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.67	0.30			0.59		0.74	0.61		0.51	0.78	0.24

Intersection Summary
























Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 82.1
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 25.9 Intersection LOS: C
 Intersection Capacity Utilization 64.3% ICU Level of Service C
 Analysis Period (min) 15
 90th %ile Actuated Cycle: 90
 70th %ile Actuated Cycle: 90
 50th %ile Actuated Cycle: 88
 30th %ile Actuated Cycle: 83.9
 10th %ile Actuated Cycle: 58.4
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 60: Fulton Ind. Blvd. & Boat Rock Blvd./Boat Rock Rd.

 Ø1	 Ø2	 Ø4
12.6 s	44.9 s	32.5 s
 Ø5	 Ø6	 Ø7
12 s	45.5 s	10 s
		 Ø8
		22.5 s













Synchro Report - Signalized Intersections
70: Lakeview Ct. & Fulton Ind. Blvd

Future - 2031 PM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	1102	7	20	1118	31	4	0	30	32	0	7
Future Volume (vph)	9	1102	7	20	1118	31	4	0	30	32	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	300		300	0		0	0		0
Storage Lanes	1		1	1		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.850	
Flt Protected	0.950			0.950				0.950		0.950		
Satd. Flow (prot)	1081	3223	1615	1289	3252	912	0	1444	1495	1347	1252	0
Flt Permitted	0.162			0.117						0.513		
Satd. Flow (perm)	184	3223	1615	159	3252	912	0	1520	1495	727	1252	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			127			127		222	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		849			1099			609			533	
Travel Time (s)		19.3			25.0			13.8			12.1	
Peak Hour Factor	0.86	0.86	0.86	0.98	0.98	0.98	0.72	0.72	0.72	0.60	0.60	0.60
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	67%	12%	0%	40%	11%	77%	25%	0%	8%	34%	0%	29%
Adj. Flow (vph)	12	1486	9	24	1323	37	6	0	48	62	0	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	1486	9	24	1323	37	0	6	48	62	14	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	

Synchro Report - Signalized Intersections
70: Lakeview Ct. & Fulton Ind. Blvd

Future - 2031 PM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	9.5	48.5	48.5	9.5	48.5	48.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (%)	10.6%	53.9%	53.9%	10.6%	53.9%	53.9%	10.6%	25.0%	25.0%	10.6%	25.0%	25.0%
Maximum Green (s)	5.0	44.0	44.0	5.0	44.0	44.0	5.0	18.0	18.0	5.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	47.1	48.0	48.0	47.8	49.6	49.6		6.4	6.4	10.9	11.2	11.2
Actuated g/C Ratio	0.74	0.75	0.75	0.75	0.78	0.78		0.10	0.10	0.17	0.18	0.18
v/c Ratio	0.06	0.61	0.01	0.11	0.52	0.05		0.04	0.18	0.35	0.03	0.03
Control Delay	4.9	10.7	0.0	5.4	7.8	0.1		33.2	1.5	31.1	0.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	10.7	0.0	5.4	7.8	0.1		33.2	1.5	31.1	0.1	0.1
LOS	A	B	A	A	A	A		C	A	C	A	A
Approach Delay		10.6			7.6			5.0			25.4	
Approach LOS		B			A			A			C	
90th %ile Green (s)	5.0	44.0	44.0	5.0	44.0	44.0	0.0	7.2	7.2	5.0	16.7	16.7
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Skip	Gap	Gap	Max	Hold	Hold
70th %ile Green (s)	0.0	44.0	44.0	5.0	53.5	53.5	0.0	6.4	6.4	5.0	15.9	15.9
70th %ile Term Code	Skip	Max	Max	Max	Hold	Hold	Skip	Gap	Gap	Max	Hold	Hold
50th %ile Green (s)	0.0	45.8	45.8	0.0	45.8	45.8	0.0	5.8	5.8	5.0	15.3	15.3
50th %ile Term Code	Skip	Dwell	Dwell	Skip	Dwell	Dwell	Skip	Gap	Gap	Max	Hold	Hold
30th %ile Green (s)	0.0	46.1	46.1	0.0	46.1	46.1	0.0	0.0	0.0	0.0	0.0	0.0
30th %ile Term Code	Skip	Dwell	Dwell	Skip	Dwell	Dwell	Skip	Skip	Skip	Skip	Skip	Skip
10th %ile Green (s)	0.0	35.9	35.9	0.0	35.9	35.9	0.0	0.0	0.0	0.0	0.0	0.0
10th %ile Term Code	Skip	Dwell	Dwell	Skip	Dwell	Dwell	Skip	Skip	Skip	Skip	Skip	Skip
Queue Length 50th (ft)	2	184	0	3	149	0		2	0	22	0	0
Queue Length 95th (ft)	6	359	0	10	317	0		11	0	37	0	0
Internal Link Dist (ft)		769			1019			529			453	
Turn Bay Length (ft)	300		300	300		300						
Base Capacity (vph)	211	2430	1249	214	2531	738		460	541	176	534	534
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.06	0.61	0.01	0.11	0.52	0.05		0.01	0.09	0.35	0.03	0.03

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 63.7

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 9.5

Intersection LOS: A

Intersection Capacity Utilization 54.9%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 79.2

70th %ile Actuated Cycle: 78.4

50th %ile Actuated Cycle: 70.1

30th %ile Actuated Cycle: 50.6

























10th %ile Actuated Cycle: 40.4

Splits and Phases: 70: Lakeview Ct. & Fulton Ind. Blvd















Synchro Report - Signalized Intersections
80: Fulton Ind. Blvd & Camp Creek Pkwy

Future - 2031 PM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	883	100	245	769	230	300	610	100	101	300	185
Future Volume (vph)	213	883	100	245	769	230	300	610	100	101	300	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	350		300	350		300	300		300
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			205			206			143			263
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1099			761			631			649	
Travel Time (s)		25.0			17.3			14.3			14.8	
Peak Hour Factor	0.79	0.93	0.92	0.81	0.91	0.92	0.91	0.91	0.91	0.81	0.81	0.81
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	313	1101	126	351	980	290	382	778	127	145	430	265
Shared Lane Traffic (%)												
Lane Group Flow (vph)	313	1101	126	351	980	290	382	778	127	145	430	265
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	

Synchro Report - Signalized Intersections
80: Fulton Ind. Blvd & Camp Creek Pkwy

Future - 2031 PM
08/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	13.0	27.0	27.0	15.5	29.5	29.5	15.0	27.5	27.5	10.0	22.5	22.5
Total Split (%)	16.3%	33.8%	33.8%	19.4%	36.9%	36.9%	18.8%	34.4%	34.4%	12.5%	28.1%	28.1%
Maximum Green (s)	8.5	22.5	22.5	11.0	25.0	25.0	10.5	23.0	23.0	5.5	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	8.5	22.3	22.3	10.7	24.5	24.5	10.5	21.4	21.4	5.5	16.4	16.4
Actuated g/C Ratio	0.11	0.29	0.29	0.14	0.31	0.31	0.13	0.27	0.27	0.07	0.21	0.21
v/c Ratio	0.84	0.76	0.21	0.75	0.88	0.45	0.83	0.80	0.24	0.60	0.58	0.49
Control Delay	55.9	29.7	1.4	43.8	36.7	9.5	50.3	33.5	4.6	47.1	31.1	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	29.7	1.4	43.8	36.7	9.5	50.3	33.5	4.6	47.1	31.1	7.2
LOS	E	C	A	D	D	A	D	C	A	D	C	A
Approach Delay		32.7			33.4			35.6			26.3	
Approach LOS		C			C			D			C	
90th %ile Green (s)	8.5	22.5	22.5	11.0	25.0	25.0	10.5	23.0	23.0	5.5	18.0	18.0
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max
70th %ile Green (s)	8.5	22.5	22.5	11.0	25.0	25.0	10.5	23.0	23.0	5.5	18.0	18.0
70th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max
50th %ile Green (s)	8.5	22.5	22.5	11.0	25.0	25.0	10.5	23.0	23.0	5.5	18.0	18.0
50th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Hold	Hold
30th %ile Green (s)	8.5	22.5	22.5	11.0	25.0	25.0	10.5	21.6	21.6	5.5	16.6	16.6
30th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Gap	Gap	Max	Hold	Hold
10th %ile Green (s)	8.5	21.5	21.5	9.6	22.6	22.6	10.5	17.0	17.0	5.5	12.0	12.0
10th %ile Term Code	Max	Hold	Hold	Gap	Gap	Gap	Max	Gap	Gap	Max	Hold	Hold
Queue Length 50th (ft)	80	184	0	88	242	30	97	185	0	37	100	1
Queue Length 95th (ft)	#119	233	7	117	#355	93	#170	251	31	59	128	40
Internal Link Dist (ft)		1019			681			551			569	
Turn Bay Length (ft)	300		300	350		300	350		300	300		300
Base Capacity (vph)	374	1468	603	485	1135	647	462	1044	568	242	817	568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.75	0.21	0.72	0.86	0.45	0.83	0.75	0.22	0.60	0.53	0.47

Intersection Summary

Synchro Report - Signalized Intersections

80: Fulton Ind. Blvd & Camp Creek Pkwy

Future - 2031 PM

08/06/2021

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 78

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 32.6

Intersection LOS: C

Intersection Capacity Utilization 70.4%

ICU Level of Service C

Analysis Period (min) 15

90th %ile Actuated Cycle: 80

70th %ile Actuated Cycle: 80

50th %ile Actuated Cycle: 80

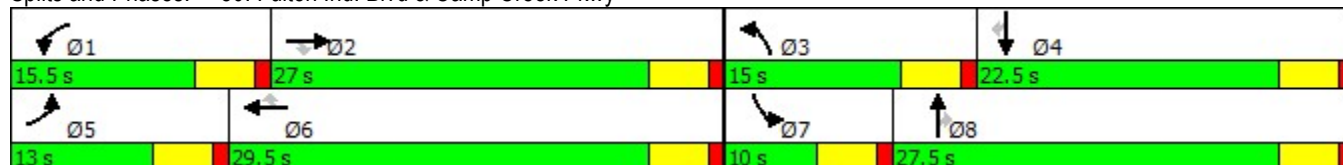
30th %ile Actuated Cycle: 78.6

10th %ile Actuated Cycle: 71.6

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 80: Fulton Ind. Blvd & Camp Creek Pkwy



























Synchro Report - Signalized Intersections

Future - 2031 PM

100: Fulton Ind. Blvd/Fulton Ind. Blvd. & Cascade Rd./Great SW Pkwy

08/06/2021













												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	50	22	327	215	10	70	99	1084	115	114	1537	8
Future Volume (vph)	50	22	327	215	10	70	99	1084	115	114	1537	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		300	300		300
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1900	1568	1736	1429	1538	1641	3252	1442	1671	3252	1380
Flt Permitted	0.731			0.732			0.050			0.100		
Satd. Flow (perm)	1362	1900	1568	1337	1429	1538	86	3252	1442	176	3252	1380
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			109			113			76
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			669			1465			1699	
Travel Time (s)		10.4			15.2			33.3			38.6	
Peak Hour Factor	0.67	0.67	0.67	0.97	0.97	0.97	0.95	0.95	0.95	0.82	0.82	0.82
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	2%	0%	3%	4%	33%	5%	10%	11%	12%	8%	11%	17%
Adj. Flow (vph)	87	38	566	257	12	84	121	1324	140	161	2174	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	87	38	566	257	12	84	121	1324	140	161	2174	11
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm

Synchro Report - Signalized Intersections

Future - 2031 PM

100: Fulton Ind. Blvd/Fulton Ind. Blvd. & Cascade Rd./Great SW Pkwy

08/06/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	10.4	40.0	40.0	9.5	39.1	39.1	10.0	83.9	83.9	16.6	90.5	90.5
Total Split (%)	6.9%	26.7%	26.7%	6.3%	26.1%	26.1%	6.7%	55.9%	55.9%	11.1%	60.3%	60.3%
Maximum Green (s)	5.9	35.5	35.5	5.0	34.6	34.6	5.5	79.4	79.4	12.1	86.0	86.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	41.4	35.5	35.5	39.6	34.6	34.6	86.1	80.6	80.6	95.7	86.0	86.0
Actuated g/C Ratio	0.28	0.24	0.24	0.26	0.23	0.23	0.57	0.54	0.54	0.64	0.57	0.57
v/c Ratio	0.22	0.08	1.25	0.70	0.04	0.19	1.14	0.76	0.17	0.73	1.17	0.01
Control Delay	41.0	45.4	165.7	59.7	45.4	4.5	161.6	30.8	5.1	36.0	111.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	45.4	165.7	59.7	45.4	4.5	161.6	30.8	5.1	36.0	111.9	0.0
LOS	D	D	F	E	D	A	F	C	A	D	F	A
Approach Delay		143.4			46.1			38.5			106.2	
Approach LOS		F			D			D			F	
90th %ile Green (s)	5.9	35.5	35.5	5.0	34.6	34.6	5.5	79.4	79.4	12.1	86.0	86.0
90th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Max	Max	Max	Max	Max
70th %ile Green (s)	5.9	35.5	35.5	5.0	34.6	34.6	5.5	79.4	79.4	12.1	86.0	86.0
70th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Hold	Hold	Max	Max	Max
50th %ile Green (s)	5.9	35.5	35.5	5.0	34.6	34.6	5.5	80.0	80.0	11.5	86.0	86.0
50th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Hold	Hold	Gap	Max	Max
30th %ile Green (s)	5.9	35.5	35.5	5.0	34.6	34.6	5.5	81.3	81.3	10.2	86.0	86.0
30th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Hold	Hold	Gap	Max	Max
10th %ile Green (s)	5.9	35.5	35.5	5.0	34.6	34.6	5.5	83.0	83.0	8.5	86.0	86.0
10th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Hold	Hold	Gap	Max	Max
Queue Length 50th (ft)	63	29	~604	208	9	0	~91	522	12	59	~1325	0
Queue Length 95th (ft)	80	46	#485	298	28	26	#231	622	48	110	#1237	0
Internal Link Dist (ft)		378			589			1385			1619	
Turn Bay Length (ft)							300		300	300		300
Base Capacity (vph)	391	449	454	366	329	438	106	1747	827	233	1864	823
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.08	1.25	0.70	0.04	0.19	1.14	0.76	0.17	0.69	1.17	0.01

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.25

Intersection Signal Delay: 85.5

Intersection LOS: F

Intersection Capacity Utilization 97.8%

ICU Level of Service F

Analysis Period (min) 15

90th %ile Actuated Cycle: 150

70th %ile Actuated Cycle: 150

50th %ile Actuated Cycle: 150

30th %ile Actuated Cycle: 150

10th %ile Actuated Cycle: 150









~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 100: Fulton Ind. Blvd/Fulton Ind. Blvd. & Cascade Rd./Great SW Pkwy

 Ø1	 Ø2	 Ø3	 Ø4
16.6 s	83.9 s	9.5 s	40 s
 Ø5	 Ø6	 Ø7	 Ø8
10 s	90.5 s	10.4 s	39.1 s

Intersection												
Int Delay, s/veh	787.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	31	0	47	43	0	156	22	1191	17	67	1222	10
Future Vol, veh/h	31	0	47	43	0	156	22	1191	17	67	1222	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	0	300	-	300	250	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	46	46	46	82	82	82	97	97	97	84	84	84
Heavy Vehicles, %	0	0	9	5	0	10	33	9	53	30	11	20
Mvmt Flow	78	0	119	61	0	221	26	1424	20	93	1688	14

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2638	3350	844	2506	3350	712	1688	0	-	1424	0	0
Stage 1	1873	1873	-	1477	1477	-	-	-	-	-	-	-
Stage 2	765	1477	-	1029	1873	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	7.08	7.6	6.5	7.1	4.76	-	-	4.7	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.6	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.6	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.39	3.55	4	3.4	2.53	-	-	2.5	-	-
Pot Cap-1 Maneuver	~ 12	8	293	~ 14	8	357	261	-	0	353	-	-
Stage 1	~ 76	122	-	128	192	-	-	-	0	-	-	-
Stage 2	366	192	-	245	122	-	-	-	0	-	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	~ 3	5	293	~ 6	5	357	261	-	-	353	-	-
Mov Cap-2 Maneuver	~ 3	5	-	~ 6	5	-	-	-	-	-	-	-
Stage 1	~ 68	90	-	115	173	-	-	-	-	-	-	-
Stage 2	126	173	-	107	90	-	-	-	-	-	-	-






















Approach	EB		WB		NB		SB	
HCM Control Delay \$	3225.8		\$ 1168.9		0.4		1	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	261	-	7	6	357	353	-	-
HCM Lane V/C Ratio	0.101	-	28.099	10.138	0.618	0.262	-	-
HCM Control Delay (s)	20.3	\$ 13225.8	\$ 5300.2	30.1	18.8	-	-	-
HCM Lane LOS	C	-	F	F	D	C	-	-
HCM 95th %tile Q(veh)	0.3	-	26.5	9.3	3.9	1	-	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon













Synchro Report - Signalized Intersections
130: Great SW Pkwy

Future - 2031 PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	1278	0	100	1250	0	50	14	0	50	106	0
Future Volume (vph)	100	1278	0	100	1250	0	50	14	0	50	106	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		250	300		300	0		0	0		0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Flt												
Flt Protected	0.950			0.950				0.963			0.984	
Satd. Flow (prot)	1770	3539	1863	1770	3539	1863	0	3408	0	0	3483	0
Flt Permitted	0.088			0.082				0.690			0.835	
Satd. Flow (perm)	164	3539	1863	153	3539	1863	0	2442	0	0	2955	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		642			731			251			574	
Travel Time (s)		14.6			16.6			5.7			13.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	126	1611	0	126	1576	0	63	18	0	63	134	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	126	1611	0	126	1576	0	0	81	0	0	197	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	

Synchro Report - Signalized Intersections
130: Great SW Pkwy

Future - 2031 PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2	6		6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5		22.5	22.5	
Total Split (s)	14.8	62.5	62.5	15.0	62.7	62.7	22.5	22.5		22.5	22.5	
Total Split (%)	14.8%	62.5%	62.5%	15.0%	62.7%	62.7%	22.5%	22.5%		22.5%	22.5%	
Maximum Green (s)	10.3	58.0	58.0	10.5	58.2	58.2	18.0	18.0		18.0	18.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5			4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0		0	0	
Act Effect Green (s)	55.2	49.0		55.1	48.9			11.2			11.2	
Actuated g/C Ratio	0.70	0.62		0.70	0.62			0.14			0.14	
v/c Ratio	0.45	0.74		0.47	0.72			0.23			0.47	
Control Delay	13.8	14.3		15.5	13.9			36.1			38.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	13.8	14.3		15.5	13.9			36.1			38.4	
LOS	B	B		B	B			D			D	
Approach Delay		14.3			14.0			36.1			38.4	
Approach LOS		B			B			D			D	
90th %ile Green (s)	10.3	58.0	58.0	10.5	58.2	58.2	15.2	15.2		15.2	15.2	
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Hold	Hold		Gap	Gap	
70th %ile Green (s)	9.1	58.0	58.0	9.5	58.4	58.4	13.0	13.0		13.0	13.0	
70th %ile Term Code	Gap	Max	Max	Gap	Hold	Hold	Hold	Hold		Gap	Gap	
50th %ile Green (s)	7.7	50.0	50.0	7.4	49.7	49.7	11.3	11.3		11.3	11.3	
50th %ile Term Code	Gap	Gap	Gap	Gap	Hold	Hold	Hold	Hold		Gap	Gap	
30th %ile Green (s)	7.0	41.3	41.3	6.5	40.8	40.8	9.4	9.4		9.4	9.4	
30th %ile Term Code	Gap	Gap	Gap	Gap	Hold	Hold	Hold	Hold		Gap	Gap	
10th %ile Green (s)	0.0	35.7	35.7	0.0	35.7	35.7	7.4	7.4		7.4	7.4	
10th %ile Term Code	Skip	Dwell	Dwell	Skip	Dwell	Dwell	Hold	Hold		Gap	Gap	
Queue Length 50th (ft)	14	283		14	275			20			50	
Queue Length 95th (ft)	62	451		66	430			45			94	
Internal Link Dist (ft)		562			651			171			494	
Turn Bay Length (ft)	300			300								
Base Capacity (vph)	337	2647		335	2655			583			706	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.37	0.61		0.38	0.59			0.14			0.28	

Intersection Summary

Synchro Report - Signalized Intersections
130: Great SW Pkwy

Future - 2031 PM
06/27/2021

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 79.2

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 15.9

Intersection LOS: B

Intersection Capacity Utilization 71.7%

ICU Level of Service C

Analysis Period (min) 15

90th %ile Actuated Cycle: 97.2

70th %ile Actuated Cycle: 94

50th %ile Actuated Cycle: 82.2

30th %ile Actuated Cycle: 70.7












10th %ile Actuated Cycle: 52.1

Splits and Phases: 130: Great SW Pkwy

 Ø1	 Ø2	 Ø4
15 s	62.5 s	22.5 s
 Ø5	 Ø6	 Ø8
14.8 s	62.7 s	22.5 s







Synchro Report - Signalized Intersections
140: Bakers Ferry Rd.

Future - 2031 PM
06/27/2021

						
Lane Group	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	99	41	1574	125	15	1069
Future Volume (vph)	99	41	1574	125	15	1069
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		300	300	
Storage Lanes	1	0		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	0.960			0.850		
Flt Protected	0.966				0.950	
Satd. Flow (prot)	1593	0	3343	1553	1327	3139
Flt Permitted	0.966				0.060	
Satd. Flow (perm)	1593	0	3343	1553	84	3139
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	18			153		
Link Speed (mph)	30		30			30
Link Distance (ft)	676		615			670
Travel Time (s)	15.4		14.0			15.2
Peak Hour Factor	0.70	0.70	0.95	0.95	0.90	0.90
Growth Factor	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	8%	17%	8%	4%	36%	15%
Adj. Flow (vph)	164	68	1922	153	19	1378
Shared Lane Traffic (%)						
Lane Group Flow (vph)	232	0	1922	153	19	1378
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (ft)	20		100	20	20	100
Trailing Detector (ft)	0		0	0	0	0
Detector 1 Position(ft)	0		0	0	0	0
Detector 1 Size(ft)	20		6	20	20	6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Perm	pm+pt	NA

Synchro Report - Signalized Intersections
140: Bakers Ferry Rd.

Future - 2031 PM
06/27/2021

						
Lane Group	NBL	NBR	NET	NER	SWL	SWT
Protected Phases	8		2		1	6
Permitted Phases				2	6	
Detector Phase	8		2	2	1	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	9.5	22.5
Total Split (s)	22.6		67.9	67.9	9.5	77.4
Total Split (%)	22.6%		67.9%	67.9%	9.5%	77.4%
Maximum Green (s)	18.1		63.4	63.4	5.0	72.9
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Min	Min	None	Min
Walk Time (s)	7.0		7.0	7.0		7.0
Flash Dont Walk (s)	11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)	0		0	0		0
Act Effect Green (s)	16.2		62.6	62.6	66.0	66.0
Actuated g/C Ratio	0.18		0.69	0.69	0.72	0.72
v/c Ratio	0.78		0.84	0.14	0.15	0.61
Control Delay	53.5		16.7	1.5	6.2	7.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	53.5		16.7	1.5	6.2	7.8
LOS	D		B	A	A	A
Approach Delay	53.5		15.5			7.7
Approach LOS	D		B			A
90th %ile Green (s)	18.1		63.4	63.4	5.0	72.9
90th %ile Term Code	Max		Max	Max	Max	Hold
70th %ile Green (s)	18.1		63.4	63.4	5.0	72.9
70th %ile Term Code	Max		Max	Max	Max	Hold
50th %ile Green (s)	18.1		63.6	63.6	0.0	63.6
50th %ile Term Code	Max		Dwell	Dwell	Skip	Dwell
30th %ile Green (s)	15.5		65.6	65.6	0.0	65.6
30th %ile Term Code	Gap		Dwell	Dwell	Skip	Dwell
10th %ile Green (s)	11.5		55.0	55.0	0.0	55.0
10th %ile Term Code	Gap		Dwell	Dwell	Skip	Dwell
Queue Length 50th (ft)	115		348	0	3	189
Queue Length 95th (ft)	157		#648	22	9	243
Internal Link Dist (ft)	596		535			590
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	333		2364	1143	129	2533
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.70		0.81	0.13	0.15	0.54

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 91.3

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 15.0

Intersection LOS: B

Intersection Capacity Utilization 67.2%

ICU Level of Service C

Analysis Period (min) 15

90th %ile Actuated Cycle: 100

70th %ile Actuated Cycle: 100

50th %ile Actuated Cycle: 90.7

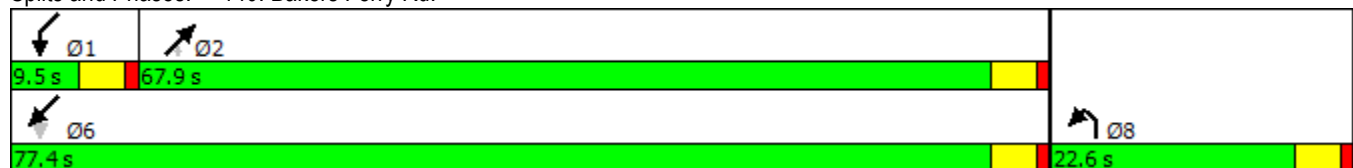
30th %ile Actuated Cycle: 90.1

10th %ile Actuated Cycle: 75.5

95th percentile volume exceeds capacity, queue may be longer.




















Queue shown is maximum after two cycles.

Splits and Phases: 140: Bakers Ferry Rd.















Synchro Report - Signalized Intersections
150: Mendel Dr./Wharton Dr.

Future - 2031 PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	134	14	38	28	8	55	22	1592	13	57	998	50
Future Volume (vph)	134	14	38	28	8	55	22	1592	13	57	998	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	300		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Frt		0.890			0.919			0.999			0.993	
Flt Protected	0.950				0.985		0.950			0.950		
Satd. Flow (prot)	1626	1446	0	0	1520	0	1357	4840	0	1687	4477	0
Flt Permitted	0.652				0.893		0.950			0.950		
Satd. Flow (perm)	1116	1446	0	0	1378	0	1357	4840	0	1687	4477	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		73			79			2			10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		409			537			753			584	
Travel Time (s)		9.3			12.2			17.1			13.3	
Peak Hour Factor	0.60	0.60	0.60	0.80	0.80	0.80	0.96	0.96	0.96	0.94	0.94	0.94
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	11%	14%	18%	14%	38%	9%	33%	7%	15%	7%	15%	16%
Adj. Flow (vph)	259	27	73	41	12	80	27	1924	16	70	1232	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	259	100	0	0	133	0	27	1940	0	70	1294	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	

Synchro Report - Signalized Intersections
150: Mendel Dr./Wharton Dr.

Future - 2031 PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	36.0	36.0		36.0	36.0		12.0	52.0		12.0	52.0	
Total Split (%)	36.0%	36.0%		36.0%	36.0%		12.0%	52.0%		12.0%	52.0%	
Maximum Green (s)	31.5	31.5		31.5	31.5		7.5	47.5		7.5	47.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)	25.2	25.2			25.2		6.9	45.6		7.3	50.2	
Actuated g/C Ratio	0.28	0.28			0.28		0.08	0.51		0.08	0.56	
v/c Ratio	0.82	0.22			0.30		0.26	0.78		0.51	0.51	
Control Delay	53.1	11.0			14.0		49.7	22.2		57.3	14.5	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	53.1	11.0			14.0		49.7	22.2		57.3	14.5	
LOS	D	B			B		D	C		E	B	
Approach Delay		41.4			14.0			22.6			16.7	
Approach LOS		D			B			C			B	
90th %ile Green (s)	31.5	31.5		31.5	31.5		7.5	47.5		7.5	47.5	
90th %ile Term Code	Max	Max		Hold	Hold		Max	Max		Max	Max	
70th %ile Green (s)	31.5	31.5		31.5	31.5		7.5	47.5		7.5	47.5	
70th %ile Term Code	Max	Max		Hold	Hold		Max	Max		Max	Hold	
50th %ile Green (s)	27.7	27.7		27.7	27.7		0.0	47.5		7.5	59.5	
50th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Max		Max	Hold	
30th %ile Green (s)	22.4	22.4		22.4	22.4		0.0	47.5		7.5	59.5	
30th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Max		Max	Hold	
10th %ile Green (s)	14.4	14.4		14.4	14.4		0.0	34.4		0.0	34.4	
10th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Dwell		Skip	Dwell	
Queue Length 50th (ft)	147	12			24		16	351		42	141	
Queue Length 95th (ft)	141	21			57		44	453		#100	260	
Internal Link Dist (ft)		329			457			673			504	
Turn Bay Length (ft)							300			300		
Base Capacity (vph)	412	580			559		119	2699		148	2729	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.63	0.17			0.24		0.23	0.72		0.47	0.47	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 89

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 22.0

Intersection LOS: C

Intersection Capacity Utilization 66.7%

ICU Level of Service C

Analysis Period (min) 15

90th %ile Actuated Cycle: 100

70th %ile Actuated Cycle: 100

50th %ile Actuated Cycle: 96.2



30th %ile Actuated Cycle: 90.9

10th %ile Actuated Cycle: 57.8

95th percentile volume exceeds capacity, queue may be longer.
























Queue shown is maximum after two cycles.

Splits and Phases: 150: Mendel Dr./Wharton Dr.

 Ø1	 Ø2	 Ø4
12 s	52 s	36 s
 Ø5	 Ø6	 Ø8
12 s	52 s	36 s













Synchro Report - Signalized Intersections
160: Marvin Miller Dr.

Future - 2031 PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations								  			  	
Traffic Volume (vph)	41	0	9	3	0	5	17	1818	7	3	1084	21
Future Volume (vph)	41	0	9	3	0	5	17	1818	7	3	1084	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		250	200		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Frt		0.976			0.913				0.850		0.997	
Flt Protected		0.961			0.983		0.950			0.950		
Satd. Flow (prot)	0	1411	0	0	905	0	1444	4803	868	902	4422	0
Flt Permitted		0.753			0.913		0.950			0.950		
Satd. Flow (perm)	0	1106	0	0	841	0	1444	4803	868	902	4422	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		65			65				65		5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		720			447			1232			950	
Travel Time (s)		16.4			10.2			28.0			21.6	
Peak Hour Factor	0.74	0.74	0.74	0.55	0.55	0.55	0.96	0.96	0.96	0.85	0.85	0.85
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	29%	0%	14%	67%	0%	100%	25%	8%	86%	100%	17%	14%
Adj. Flow (vph)	64	0	14	6	0	11	21	2197	8	4	1479	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	78	0	0	17	0	21	2197	8	4	1508	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	

Synchro Report - Signalized Intersections
160: Marvin Miller Dr.

Future - 2031 PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5	22.5	9.5	22.5	
Total Split (s)	23.0	23.0		23.0	23.0		11.0	67.0	67.0	10.0	66.0	
Total Split (%)	23.0%	23.0%		23.0%	23.0%		11.0%	67.0%	67.0%	10.0%	66.0%	
Maximum Green (s)	18.5	18.5		18.5	18.5		6.5	62.5	62.5	5.5	61.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		None	C-Min	C-Min	Min	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	
Act Effect Green (s)		7.9			7.9		7.1	74.4	74.4	6.2	80.8	
Actuated g/C Ratio		0.08			0.08		0.07	0.74	0.74	0.06	0.81	
v/c Ratio		0.53			0.13		0.21	0.62	0.01	0.07	0.42	
Control Delay		27.5			2.2		47.9	7.9	0.0	41.0	1.5	
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		27.5			2.2		47.9	7.9	0.0	41.0	1.5	
LOS		C			A		D	A	A	D	A	
Approach Delay		27.5			2.2			8.3			1.6	
Approach LOS		C			A			A			A	
90th %ile Green (s)	12.9	12.9		12.9	12.9		9.2	66.1	66.1	7.5	64.4	
90th %ile Term Code	Gap	Gap		Hold	Hold		Gap	Coord	Coord	Gap	Coord	
70th %ile Green (s)	9.2	9.2		9.2	9.2		7.8	70.8	70.8	6.5	69.5	
70th %ile Term Code	Gap	Gap		Hold	Hold		Gap	Coord	Coord	Gap	Coord	
50th %ile Green (s)	6.6	6.6		6.6	6.6		0.0	74.0	74.0	5.9	84.4	
50th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Coord	Coord	Gap	Coord	
30th %ile Green (s)	5.5	5.5		5.5	5.5		0.0	75.5	75.5	5.5	85.5	
30th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Coord	Coord	Gap	Coord	
10th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	85.5	85.5	5.5	95.5	
10th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Coord	Coord	Gap	Coord	
Queue Length 50th (ft)		8			0		13	206	0	3	0	
Queue Length 95th (ft)		34			0		36	338	0	m3	0	
Internal Link Dist (ft)		640			367			1152			870	
Turn Bay Length (ft)							250		250	200		
Base Capacity (vph)		257			208		106	3572	662	55	3572	
Starvation Cap Reductn		0			0		0	0	0	0	0	
Spillback Cap Reductn		0			0		0	0	0	0	0	
Storage Cap Reductn		0			0		0	0	0	0	0	
Reduced v/c Ratio		0.30			0.08		0.20	0.62	0.01	0.07	0.42	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 41 (41%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 6.0

Intersection LOS: A


Intersection Capacity Utilization 54.7%

ICU Level of Service A

Analysis Period (min) 15




















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 160: Marvin Miller Dr.

 Ø1	 Ø2 (R)	 Ø4
10 s	67 s	23 s
 Ø5	 Ø6 (R)	 Ø8
11 s	66 s	23 s













Synchro Report - Signalized Intersections
170: Patton Dr.

Future - 2031 PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	30	0	0	250	219	64	1800	0	35	1108	0
Future Volume (vph)	30	30	0	0	250	219	64	1800	0	35	1108	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		0	300		0
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frt					0.937							
Flt Protected		0.976					0.950			0.950		
Satd. Flow (prot)	0	1545	0	0	1484	0	1504	4322	0	1504	4322	1583
Flt Permitted		0.343					0.950			0.950		
Satd. Flow (perm)	0	543	0	0	1484	0	1504	4322	0	1504	4322	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					48							
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		749			928			950			975	
Travel Time (s)		17.0			21.1			21.6			22.2	
Peak Hour Factor	0.79	0.79	0.79	0.90	0.90	0.90	0.96	0.96	0.96	0.73	0.73	0.73
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Adj. Flow (vph)	44	44	0	0	322	282	77	2175	0	56	1761	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	88	0	0	604	0	77	2175	0	56	1761	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA			NA		Prot	NA		Prot	NA	Perm

Synchro Report - Signalized Intersections
170: Patton Dr.

Future - 2031 PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	22.5
Total Split (s)	39.0	39.0		39.0	39.0		10.7	51.5		9.5	50.3	50.3
Total Split (%)	39.0%	39.0%		39.0%	39.0%		10.7%	51.5%		9.5%	50.3%	50.3%
Maximum Green (s)	34.5	34.5		34.5	34.5		6.2	47.0		5.0	45.8	45.8
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0			0	0
Act Effct Green (s)		34.5			34.5		6.2	48.9		5.0	45.8	
Actuated g/C Ratio		0.34			0.34		0.06	0.49		0.05	0.46	
v/c Ratio		0.47			1.11		0.83	1.03		0.75	0.89	
Control Delay		35.7			103.4		97.8	48.3		103.2	31.2	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		35.7			103.4		97.8	48.3		103.2	31.2	
LOS		D			F		F	D		F	C	
Approach Delay		35.7			103.4			49.9			33.4	
Approach LOS		D			F			D			C	
90th %ile Green (s)	34.5	34.5		34.5	34.5		6.2	47.0		5.0	45.8	45.8
90th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Max	Coord	Coord
70th %ile Green (s)	34.5	34.5		34.5	34.5		6.2	47.0		5.0	45.8	45.8
70th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Max	Coord	Coord
50th %ile Green (s)	34.5	34.5		34.5	34.5		6.2	47.0		5.0	45.8	45.8
50th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Max	Coord	Coord
30th %ile Green (s)	34.5	34.5		34.5	34.5		6.2	47.0		5.0	45.8	45.8
30th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Max	Coord	Coord
10th %ile Green (s)	34.5	34.5		34.5	34.5		6.2	56.5		0.0	45.8	45.8
10th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Skip	Coord	Coord
Queue Length 50th (ft)		43			~423		53	~568		37	433	
Queue Length 95th (ft)		80			#638		m#111	#646		m#78	389	
Internal Link Dist (ft)		669			848			870			895	
Turn Bay Length (ft)							200			300		
Base Capacity (vph)		187			543		93	2113		75	1979	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.47			1.11		0.83	1.03		0.75	0.89	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 40 (40%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 50.2

Intersection LOS: D

Intersection Capacity Utilization 88.6%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 170: Patton Dr.















Synchro Report - Signalized Intersections
180: Commerce Cir.

Future - 2031 PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	27	2031	5	91	1120	14	76	4	20	15	5	82
Future Volume (vph)	27	2031	5	91	1120	14	76	4	20	15	5	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998			0.973			0.892	
Flt Protected	0.950			0.950				0.963			0.993	
Satd. Flow (prot)	1805	4801	0	1770	5534	0	0	1724	0	0	1651	0
Flt Permitted	0.950			0.950				0.491			0.948	
Satd. Flow (perm)	1805	4801	0	1770	5534	0	0	879	0	0	1576	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			4			11			117	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		760			245			480			470	
Travel Time (s)		17.3			5.6			10.9			10.7	
Peak Hour Factor	0.96	0.96	0.96	0.84	0.84	0.84	0.85	0.85	0.85	0.68	0.68	0.68
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	0%	8%	20%	2%	18%	7%	3%	0%	5%	13%	0%	0%
Adj. Flow (vph)	33	2454	6	126	1547	19	104	5	27	26	9	140
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	2460	0	126	1566	0	0	136	0	0	175	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	

Synchro Report - Signalized Intersections
180: Commerce Cir.

Future - 2031 PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Protected Phases	5	2		1	6			4				8
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4		8		8
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	10.6	60.6		15.6	65.6		23.8	23.8		23.8	23.8	
Total Split (%)	10.6%	60.6%		15.6%	65.6%		23.8%	23.8%		23.8%	23.8%	
Maximum Green (s)	6.1	56.1		11.1	61.1		19.3	19.3		19.3	19.3	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	6.0	59.4		10.4	67.9			16.7			16.7	
Actuated g/C Ratio	0.06	0.59		0.10	0.68			0.17			0.17	
v/c Ratio	0.31	0.86		0.69	0.42			0.87			0.49	
Control Delay	52.8	5.4		57.8	8.2			82.8			18.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	52.8	5.4		57.8	8.2			82.8			18.2	
LOS	D	A		E	A			F			B	
Approach Delay		6.0			11.9			82.8			18.2	
Approach LOS		A			B			F			B	
90th %ile Green (s)	6.1	56.1		11.1	61.1		19.3	19.3		19.3	19.3	
90th %ile Term Code	Max	Coord		Max	Coord		Max	Max		Hold	Hold	
70th %ile Green (s)	6.1	56.1		11.1	61.1		19.3	19.3		19.3	19.3	
70th %ile Term Code	Max	Coord		Max	Coord		Max	Max		Hold	Hold	
50th %ile Green (s)	6.1	56.1		11.1	61.1		19.3	19.3		19.3	19.3	
50th %ile Term Code	Max	Coord		Max	Coord		Max	Max		Hold	Hold	
30th %ile Green (s)	0.0	60.2		10.7	75.4		15.6	15.6		15.6	15.6	
30th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	0.0	68.5		7.9	80.9		10.1	10.1		10.1	10.1	
10th %ile Term Code	Skip	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)	22	78		86	106			76			31	
Queue Length 95th (ft)	m21	m75		#140	111			#160			50	
Internal Link Dist (ft)		680			165			400			390	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	111	2852		196	3759			178			398	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.30	0.86		0.64	0.42			0.76			0.44	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 73 (73%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 11.0

Intersection LOS: B

Intersection Capacity Utilization 76.0%

ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 180: Commerce Cir.



Synchro Report - Unsignalized Intersections
190: Fulton Ind. Circle

Future - 2031 PM
06/27/2021





















Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↑
Traffic Volume (vph)	0	2225	1185	65	0	40
Future Volume (vph)	0	2225	1185	65	0	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.86	0.86	0.86	1.00	1.00
Frt			0.987			0.865
Flt Protected						
Satd. Flow (prot)	0	6052	5564	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	6052	5564	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		245	541		662	
Travel Time (s)		5.6	12.3		15.0	
Peak Hour Factor	0.97	0.97	0.84	0.48	0.88	0.88
Growth Factor	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	8%	8%	17%	5%	2%	2%
Adj. Flow (vph)	0	2661	1636	157	0	53
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2661	1793	0	0	53
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.7%
Analysis Period (min)	15
	ICU Level of Service A













Synchro Report - Signalized Intersections
200: Shirley Dr.

Future - 2031 PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	2223	14	73	1249	7	15	0	125	9	0	1
Future Volume (vph)	10	2223	14	73	1249	7	15	0	125	9	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.999			0.879			0.986	
Flt Protected	0.950			0.950				0.995			0.957	
Satd. Flow (prot)	1805	6044	0	1388	5633	0	0	1570	0	0	1629	0
Flt Permitted	0.950			0.950				0.962			0.399	
Satd. Flow (perm)	1805	6044	0	1388	5633	0	0	1518	0	0	679	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			2			155			115	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		541			537			437			323	
Travel Time (s)		12.3			12.2			9.9			7.3	
Peak Hour Factor	0.92	0.92	0.92	0.85	0.85	0.85	0.81	0.81	0.81	0.61	0.61	0.61
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	0%	8%	14%	30%	16%	0%	13%	0%	5%	11%	2%	2%
Adj. Flow (vph)	13	2803	18	100	1705	10	21	0	179	17	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	2821	0	100	1715	0	0	200	0	0	19	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	

Synchro Report - Signalized Intersections
200: Shirley Dr.

Future - 2031 PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	9.6	59.2		18.0	67.6		22.8	22.8		22.8	22.8	
Total Split (%)	9.6%	59.2%		18.0%	67.6%		22.8%	22.8%		22.8%	22.8%	
Maximum Green (s)	5.1	54.7		13.5	63.1		18.3	18.3		18.3	18.3	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	C-Max		Min	C-Max		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	6.2	65.0		12.0	70.8			9.5			9.5	
Actuated g/C Ratio	0.06	0.65		0.12	0.71			0.10			0.10	
v/c Ratio	0.12	0.72		0.60	0.43			0.70			0.11	
Control Delay	51.2	3.4		69.3	1.6			25.4			1.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	51.2	3.4		69.3	1.6			25.4			1.3	
LOS	D	A		E	A			C			A	
Approach Delay		3.6			5.3			25.4			1.3	
Approach LOS		A			A			C			A	
90th %ile Green (s)	7.1	54.7		15.5	63.1		16.3	16.3		16.3	16.3	
90th %ile Term Code	Max	Coord		Max	Coord		Gap	Gap		Hold	Hold	
70th %ile Green (s)	6.7	60.1		14.6	68.0		11.8	11.8		11.8	11.8	
70th %ile Term Code	Gap	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	6.1	65.5		12.4	71.8		8.6	8.6		8.6	8.6	
50th %ile Term Code	Gap	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	5.6	70.7		10.3	75.4		5.5	5.5		5.5	5.5	
30th %ile Term Code	Gap	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	5.5	73.9		7.1	75.5		5.5	5.5		5.5	5.5	
10th %ile Term Code	Gap	Coord		Gap	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)	0	45		63	19			28			0	
Queue Length 95th (ft)	m12	79		m99	m40			71			0	
Internal Link Dist (ft)		461			457			357			243	
Turn Bay Length (ft)	300			150								
Base Capacity (vph)	112	3928		196	3986			404			218	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	68		0	0			1			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.12	0.73		0.51	0.43			0.50			0.09	

Synchro Report - Signalized Intersections

200: Shirley Dr.

Future - 2031 PM
06/27/2021

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 92 (92%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 5.1

Intersection LOS: A

Intersection Capacity Utilization 63.1%

ICU Level of Service B

Analysis Period (min) 15




















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Shirley Dr.















Synchro Report - Signalized Intersections
210: I-20 EB Ramp

Future - 2031 PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	251	0	174	0	0	0	0	1057	1178	409	1320	0
Future Volume (vph)	251	0	174	0	0	0	0	1057	1178	409	1320	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	225		0	0		0
Storage Lanes	2		1	0		0	0		2	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.88	1.00	0.91	1.00
Frt			0.850						0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	3183	0	1346	0	0	0	0	6052	2608	1736	4510	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	3183	0	1346	0	0	0	0	6052	2608	1736	4510	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			65						732			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		758			734			537			524	
Travel Time (s)		17.2			16.7			12.2			11.9	
Peak Hour Factor	0.84	0.84	0.84	0.92	0.92	0.92	0.84	0.84	0.84	0.91	0.91	0.91
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	10%	0%	20%	2%	2%	2%	0%	8%	9%	4%	15%	0%
Adj. Flow (vph)	347	0	240	0	0	0	0	1460	1627	521	1683	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	347	0	240	0	0	0	0	1460	1627	521	1683	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1					2	1	1	2	
Detector Template	Left		Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20		20					100	20	20	100	
Trailing Detector (ft)	0		0					0	0	0	0	
Detector 1 Position(ft)	0		0					0	0	0	0	
Detector 1 Size(ft)	20		20					6	20	20	6	
Detector 1 Type	Cl+Ex		Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Prot		Perm					NA	Perm	Prot	NA	

Synchro Report - Signalized Intersections
210: I-20 EB Ramp

Future - 2031 PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	7							2		1	6	
Permitted Phases			7						2			
Detector Phase	7		7					2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0		5.0					5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5		9.5					22.5	22.5	9.5	22.5	
Total Split (s)	18.0		18.0					48.8	48.8	33.2	82.0	
Total Split (%)	18.0%		18.0%					48.8%	48.8%	33.2%	82.0%	
Maximum Green (s)	13.5		13.5					44.3	44.3	28.7	77.5	
Yellow Time (s)	3.5		3.5					3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0		1.0					1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5		4.5					4.5	4.5	4.5	4.5	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0		3.0					3.0	3.0	3.0	3.0	
Recall Mode	None		None					C-Min	C-Min	None	C-Min	
Walk Time (s)								7.0	7.0		7.0	
Flash Dont Walk (s)								11.0	11.0		11.0	
Pedestrian Calls (#/hr)								0	0		0	
Act Effct Green (s)	13.5		13.5					44.3	44.3	28.7	77.5	
Actuated g/C Ratio	0.14		0.14					0.44	0.44	0.29	0.78	
v/c Ratio	0.81		1.01					0.54	1.04	1.05	0.48	
Control Delay	57.8		94.9					10.9	40.5	69.6	3.4	
Queue Delay	0.0		0.0					0.0	24.0	0.0	0.5	
Total Delay	57.8		94.9					10.9	64.5	69.6	3.9	
LOS	E		F					B	E	E	A	
Approach Delay		73.0						39.2			19.4	
Approach LOS		E						D			B	
90th %ile Green (s)	13.5		13.5					44.3	44.3	28.7	77.5	
90th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
70th %ile Green (s)	13.5		13.5					44.3	44.3	28.7	77.5	
70th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
50th %ile Green (s)	13.5		13.5					44.3	44.3	28.7	77.5	
50th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
30th %ile Green (s)	13.5		13.5					44.3	44.3	28.7	77.5	
30th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
10th %ile Green (s)	13.5		13.5					44.3	44.3	28.7	77.5	
10th %ile Term Code	Max		Max					Coord	Coord	Max	Coord	
Queue Length 50th (ft)	112		~118					82	~117	~357	101	
Queue Length 95th (ft)	#158		#245					69	#145	m#416	m110	
Internal Link Dist (ft)		678			654			457			444	
Turn Bay Length (ft)												
Base Capacity (vph)	429		237					2681	1563	498	3495	
Starvation Cap Reductn	0		0					0	168	0	1182	
Spillback Cap Reductn	0		0					0	0	0	0	
Storage Cap Reductn	0		0					0	0	0	0	
Reduced v/c Ratio	0.81		1.01					0.54	1.17	1.05	0.73	

Synchro Report - Signalized Intersections

210: I-20 EB Ramp

Future - 2031 PM

06/27/2021

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 4 (4%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 35.1

Intersection LOS: D

Intersection Capacity Utilization 93.6%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 210: I-20 EB Ramp















Synchro Report - Signalized Intersections
220: I-20 WB Ramp

Future - 2031 PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	520	0	265	305	978	0	0	1189	873
Future Volume (vph)	0	0	0	520	0	265	305	978	0	0	1189	873
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		400	0		0	0		0
Storage Lanes	0		0	3		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.94	1.00	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Frt						0.850					0.936	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	4545	0	1524	1517	4715	0	0	5801	0
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	4545	0	1524	1517	4715	0	0	5801	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						117					231	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		487			795			524			744	
Travel Time (s)		11.1			18.1			11.9			16.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	2%	2%	2%	12%	2%	6%	19%	10%	2%	16%	8%	2%
Adj. Flow (vph)	0	0	0	656	0	334	385	1233	0	0	1499	1101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	656	0	334	385	1233	0	0	2600	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		36			36			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	
Detector Template				Left		Right	Left	Thru			Thru	
Leading Detector (ft)				20		20	20	100			100	
Trailing Detector (ft)				0		0	0	0			0	
Detector 1 Position(ft)				0		0	0	0			0	
Detector 1 Size(ft)				20		20	20	6			6	
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Prot		Perm	Prot	NA			NA	

Synchro Report - Signalized Intersections
220: I-20 WB Ramp

Future - 2031 PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases				3			5	2			6	
Permitted Phases						8						
Detector Phase				3		8	5	2			6	
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	
Minimum Split (s)				9.5		22.5	9.5	22.5			22.5	
Total Split (s)				22.6		22.6	30.3	77.4			47.1	
Total Split (%)				22.6%		22.6%	30.3%	77.4%			47.1%	
Maximum Green (s)				18.1		18.1	25.8	72.9			42.6	
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	
Recall Mode				None		None	None	C-Min			C-Min	
Walk Time (s)						7.0		7.0			7.0	
Flash Dont Walk (s)						11.0		11.0			11.0	
Pedestrian Calls (#/hr)						0		0			0	
Act Effect Green (s)				17.6		17.6	26.3	73.4			42.6	
Actuated g/C Ratio				0.18		0.18	0.26	0.73			0.43	
v/c Ratio				0.82		0.92	0.96	0.36			1.35dr	
Control Delay				49.2		57.8	65.3	0.3			33.7	
Queue Delay				0.0		0.0	0.0	0.0			0.0	
Total Delay				49.2		57.8	65.3	0.3			33.7	
LOS				D		E	E	A			C	
Approach Delay					52.1			15.8			33.7	
Approach LOS					D			B			C	
90th %ile Green (s)				18.1		18.1	25.8	72.9			42.6	
90th %ile Term Code				Max		Max	Max	Coord			Coord	
70th %ile Green (s)				18.1		18.1	25.8	72.9			42.6	
70th %ile Term Code				Max		Max	Max	Coord			Coord	
50th %ile Green (s)				18.1		18.1	25.8	72.9			42.6	
50th %ile Term Code				Max		Max	Max	Coord			Coord	
30th %ile Green (s)				18.1		18.1	25.8	72.9			42.6	
30th %ile Term Code				Hold		Max	Max	Coord			Coord	
10th %ile Green (s)				15.5		15.5	28.4	75.5			42.6	
10th %ile Term Code				Gap		Hold	Max	Coord			Coord	
Queue Length 50th (ft)				143		140	232	0			427	
Queue Length 95th (ft)				186		#306	m#421	0			m#541	
Internal Link Dist (ft)		407			715			444			664	
Turn Bay Length (ft)						400						
Base Capacity (vph)				822		371	399	3461			2603	
Starvation Cap Reductn				0		0	0	0			0	
Spillback Cap Reductn				0		0	0	0			0	
Storage Cap Reductn				0		0	0	0			0	
Reduced v/c Ratio				0.80		0.90	0.96	0.36			1.00	

Synchro Report - Signalized Intersections

220: I-20 WB Ramp

Future - 2031 PM

06/27/2021

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 47 (47%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 31.7

Intersection LOS: C

Intersection Capacity Utilization 93.6%

ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

























dr Defacto Right Lane. Recode with 1 though lane as a right lane.













Splits and Phases: 220: I-20 WB Ramp



Synchro Report - Signalized Intersections
230: Wendell Dr.

Future - 2031 PM
06/27/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		  			  			 			 	
Traffic Volume (vph)	39	1182	131	30	1598	5	48	13	50	121	16	35
Future Volume (vph)	39	1182	131	30	1598	5	48	13	50	121	16	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	200		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.982			0.999			0.946			0.976	
Flt Protected	0.950			0.950				0.975			0.967	
Satd. Flow (prot)	1399	4771	0	1805	4756	0	0	1672	0	0	1725	0
Flt Permitted	0.079			0.109				0.767			0.653	
Satd. Flow (perm)	116	4771	0	207	4756	0	0	1316	0	0	1165	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		54			1			24			10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			1498			395			449	
Travel Time (s)		16.9			34.0			9.0			10.2	
Peak Hour Factor	0.58	0.92	0.76	0.78	0.97	0.69	0.56	0.80	0.73	0.78	0.50	0.88
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	29%	7%	5%	0%	9%	0%	0%	8%	10%	5%	0%	3%
Adj. Flow (vph)	78	1490	200	45	1911	8	99	19	79	180	37	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	1690	0	45	1919	0	0	197	0	0	263	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	72.8	72.8		72.8	72.8		27.2	27.2		27.2	27.2	
Total Split (%)	72.8%	72.8%		72.8%	72.8%		27.2%	27.2%		27.2%	27.2%	
Maximum Green (s)	68.3	68.3		68.3	68.3		22.7	22.7		22.7	22.7	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)	68.3	68.3		68.3	68.3			22.7			22.7	
Actuated g/C Ratio	0.68	0.68		0.68	0.68			0.23			0.23	
v/c Ratio	0.99	0.52		0.32	0.59			0.62			0.97	
Control Delay	115.2	2.9		3.3	2.8			40.1			85.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	115.2	2.9		3.3	2.8			40.1			85.5	
LOS	F	A		A	A			D			F	
Approach Delay		7.9			2.8			40.1			85.5	
Approach LOS		A			A			D			F	
90th %ile Green (s)	68.3	68.3		68.3	68.3		22.7	22.7		22.7	22.7	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
70th %ile Green (s)	68.3	68.3		68.3	68.3		22.7	22.7		22.7	22.7	
70th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Max	Max	
50th %ile Green (s)	68.3	68.3		68.3	68.3		22.7	22.7		22.7	22.7	
50th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Max	Max	
30th %ile Green (s)	68.3	68.3		68.3	68.3		22.7	22.7		22.7	22.7	
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Max	Max	
10th %ile Green (s)	68.3	68.3		68.3	68.3		22.7	22.7		22.7	22.7	
10th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Max	Max	
Queue Length 50th (ft)	45	71		2	32			100			161	
Queue Length 95th (ft)	m#73	m79		m2	m27			151			122	
Internal Link Dist (ft)		664			1418			315			369	
Turn Bay Length (ft)	150			200								
Base Capacity (vph)	79	3275		141	3248			317			272	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.99	0.52		0.32	0.59			0.62			0.97	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 27 (27%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.99

Intersection Signal Delay: 11.9

Intersection LOS: B

Intersection Capacity Utilization 63.0%

ICU Level of Service B

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

























m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 230: Wendell Dr.















Synchro Report - Signalized Intersections
240: MLK Jr. Dr.

Future - 2031 PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	130	479	490	251	612	55	513	514	161	80	1058	229
Future Volume (vph)	130	479	490	251	612	55	513	514	161	80	1058	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	250		400	350		0	300		0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3242	3505	1553	3335	3539	1429	3303	3223	1509	3400	3312	1482
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3242	3505	1553	3335	3539	1429	3303	3223	1509	3400	3312	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			214			164			199			181
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1101			1180			1498			1729	
Travel Time (s)		25.0			26.8			34.0			39.3	
Peak Hour Factor	0.88	0.88	0.88	0.86	0.86	0.86	0.94	0.94	0.94	0.88	0.88	0.88
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	8%	3%	4%	5%	2%	13%	6%	12%	7%	3%	9%	9%
Adj. Flow (vph)	171	631	646	339	825	74	633	634	199	105	1395	302
Shared Lane Traffic (%)												
Lane Group Flow (vph)	171	631	646	339	825	74	633	634	199	105	1395	302
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm

Synchro Report - Signalized Intersections
240: MLK Jr. Dr.

Future - 2031 PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	10.8	28.0	28.0	13.0	30.2	30.2	19.0	47.5	47.5	11.5	40.0	40.0
Total Split (%)	10.8%	28.0%	28.0%	13.0%	30.2%	30.2%	19.0%	47.5%	47.5%	11.5%	40.0%	40.0%
Maximum Green (s)	6.3	23.5	23.5	8.5	25.7	25.7	14.5	43.0	43.0	7.0	35.5	35.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	6.3	23.5	23.5	8.5	25.7	25.7	14.5	45.3	45.3	6.8	35.5	35.5
Actuated g/C Ratio	0.06	0.24	0.24	0.08	0.26	0.26	0.14	0.45	0.45	0.07	0.36	0.36
v/c Ratio	0.84	0.77	1.22	1.20	0.91	0.15	1.32	0.43	0.25	0.45	1.19	0.47
Control Delay	79.4	42.8	141.1	158.7	51.1	0.7	188.0	15.3	4.6	65.6	114.3	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.4	42.8	141.1	158.7	51.1	0.7	188.0	15.3	4.6	65.6	114.3	5.3
LOS	E	D	F	F	D	A	F	B	A	E	F	A
Approach Delay		91.0			77.6			88.4			93.2	
Approach LOS		F			E			F			F	
90th %ile Green (s)	6.3	23.5	23.5	8.5	25.7	25.7	14.5	43.0	43.0	7.0	35.5	35.5
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	6.3	23.5	23.5	8.5	25.7	25.7	14.5	43.0	43.0	7.0	35.5	35.5
70th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	6.3	23.5	23.5	8.5	25.7	25.7	14.5	43.0	43.0	7.0	35.5	35.5
50th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
30th %ile Green (s)	6.3	23.5	23.5	8.5	25.7	25.7	14.5	43.0	43.0	7.0	35.5	35.5
30th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
10th %ile Green (s)	6.3	23.5	23.5	8.5	25.7	25.7	14.5	54.5	54.5	0.0	35.5	35.5
10th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	56	198	~399	~135	268	0	~265	168	39	34	~572	44
Queue Length 95th (ft)	#111	255	#593	#210	#350	0	m#381	m202	m64	m48	#676	m32
Internal Link Dist (ft)		1021			1100			1418			1649	
Turn Bay Length (ft)				250		400	350			300		
Base Capacity (vph)	204	823	528	283	909	489	478	1459	792	238	1175	642
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.77	1.22	1.20	0.91	0.15	1.32	0.43	0.25	0.44	1.19	0.47

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 90 (90%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.32

Intersection Signal Delay: 88.2

Intersection LOS: F

Intersection Capacity Utilization 89.8%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.


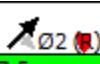






Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.























m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 240: MLK Jr. Dr.

 Ø1	 Ø2 (R)	 Ø3	 Ø4
11.5 s	47.5 s	13 s	28 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
19 s	40 s	10.8 s	30.2 s













Synchro Report - Signalized Intersections
250: Old Gordon Rd.

Future - 2031 PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	4	10	4	47	50	40	38	691	20	30	1089	20
Future Volume (vph)	4	10	4	47	50	40	38	691	20	30	1089	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	150		250
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.933				0.850			0.850
Flt Protected		0.986		0.950			0.950			0.950		
Satd. Flow (prot)	0	1837	1583	1770	1738	0	1612	3223	1442	1656	3312	1482
Flt Permitted		0.935		0.615			0.087			0.258		
Satd. Flow (perm)	0	1742	1583	1146	1738	0	148	3223	1442	450	3312	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115		40				115			115
Link Speed (mph)		30		30			30			30		30
Link Distance (ft)		617		886			1729			1350		
Travel Time (s)		14.0		20.1			39.3			30.7		
Peak Hour Factor	0.63	0.63	0.63	0.78	0.83	0.83	0.79	0.91	0.92	0.75	0.94	0.92
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	12%	12%	12%	9%	9%	9%
Adj. Flow (vph)	7	18	7	70	70	56	56	881	25	46	1344	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	25	7	70	126	0	56	881	25	46	1344	25
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12		12			24			24		
Link Offset(ft)		0		0			0			0		
Crosswalk Width(ft)		16		16			16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94		94			94			94		
Detector 2 Size(ft)		6		6			6			6		
Detector 2 Type		Cl+Ex		Cl+Ex			Cl+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0		0.0			0.0			0.0		
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm

Synchro Report - Signalized Intersections
250: Old Gordon Rd.

Future - 2031 PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases		6		5	2		7	4		3	8	
Permitted Phases	6		6	2			4		4	8		8
Detector Phase	6	6	6	5	2		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	22.7	22.7	22.7	9.8	32.5		10.9	57.9	57.9	9.6	56.6	56.6
Total Split (%)	22.7%	22.7%	22.7%	9.8%	32.5%		10.9%	57.9%	57.9%	9.6%	56.6%	56.6%
Maximum Green (s)	18.2	18.2	18.2	5.3	28.0		6.4	53.4	53.4	5.1	52.1	52.1
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0			0	0		0	0
Act Effect Green (s)		24.7	24.7	33.0	33.0		56.1	52.2	52.2	53.3	49.3	49.3
Actuated g/C Ratio		0.25	0.25	0.33	0.33		0.56	0.52	0.52	0.53	0.49	0.49
v/c Ratio		0.06	0.01	0.17	0.21		0.32	0.52	0.03	0.15	0.82	0.03
Control Delay		34.5	0.0	27.6	19.6		10.0	11.3	0.4	6.6	16.6	0.1
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		34.5	0.0	27.6	19.6		10.0	11.3	0.4	6.6	16.6	0.1
LOS		C	A	C	B		A	B	A	A	B	A
Approach Delay		27.0			22.5			10.9			16.0	
Approach LOS		C			C			B			B	
90th %ile Green (s)	18.2	18.2	18.2	5.3	28.0		6.4	53.4	53.4	5.1	52.1	52.1
90th %ile Term Code	Coord	Coord	Coord	Max	Coord		Max	Hold	Hold	Max	Max	Max
70th %ile Green (s)	18.2	18.2	18.2	5.3	28.0		6.4	53.4	53.4	5.1	52.1	52.1
70th %ile Term Code	Coord	Coord	Coord	Max	Coord		Max	Hold	Hold	Max	Max	Max
50th %ile Green (s)	18.2	18.2	18.2	6.0	28.7		6.4	52.7	52.7	5.1	51.4	51.4
50th %ile Term Code	Coord	Coord	Coord	Max	Coord		Max	Hold	Hold	Max	Gap	Gap
30th %ile Green (s)	20.4	20.4	20.4	7.2	32.1		6.4	58.9	58.9	0.0	48.0	48.0
30th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Max	Hold	Hold	Skip	Gap	Gap
10th %ile Green (s)	48.3	48.3	48.3	0.0	48.3		0.0	42.7	42.7	0.0	42.7	42.7
10th %ile Term Code	Coord	Coord	Coord	Skip	Coord		Skip	Hold	Hold	Skip	Gap	Gap
Queue Length 50th (ft)		13	0	33	41		2	205	0	6	108	0
Queue Length 95th (ft)		25	0	58	79		m10	m263	m1	13	134	m0
Internal Link Dist (ft)		537			806			1649			1270	
Turn Bay Length (ft)							150			150		250
Base Capacity (vph)		429	477	414	600		176	1756	838	301	1725	827
Starvation Cap Reductn		0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio		0.06	0.01	0.17	0.21		0.32	0.50	0.03	0.15	0.78	0.03

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 1 (1%), Referenced to phase 2:NWTL and 6:SETL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 14.7

Intersection LOS: B







Intersection Capacity Utilization 56.2%

ICU Level of Service B







Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 250: Old Gordon Rd.

 Ø2 (L)	 Ø3	 Ø4
32.5 s	9.6 s	57.9 s
 Ø5	 Ø7	 Ø8
9.8 s	10.9 s	56.6 s



Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	149	149	100	635	990	0
Future Volume (vph)	149	149	100	635	990	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Fr t	0.850					
Flt Protected	0.950	0.950				
Satd. Flow (prot)	1770	1583	1770	3539	3539	1863
Flt Permitted	0.950	0.154				
Satd. Flow (perm)	1770	1583	287	3539	3539	1863
Right Turn on Red	Yes					Yes
Satd. Flow (RTOR)	188					
Link Speed (mph)	30	30				30
Link Distance (ft)	912	1889				1254
Travel Time (s)	20.7	42.9				28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	188	188	126	801	1248	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	188	188	126	801	1248	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12	12				12
Link Offset(ft)	0	0				0
Crosswalk Width(ft)	16	16				16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9		
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4	5		2	6	
Permitted Phases	4		2	6		
Detector Phase	4	4	5	2	6	6
Switch Phase						

Synchro Report - Signalized Intersections
270: Fulton Ind. Blvd & UPS Drive

Future - 2031 PM
06/27/2021



Lane Group	SEL	SER	NEL	NET	SWT	SWR
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	15.0	74.0	59.0	59.0
Total Split (%)	26.0%	26.0%	15.0%	74.0%	59.0%	59.0%
Maximum Green (s)	21.5	21.5	10.5	69.5	54.5	54.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effect Green (s)	15.8	15.8	75.2	75.2	63.1	
Actuated g/C Ratio	0.16	0.16	0.75	0.75	0.63	
v/c Ratio	0.67	0.46	0.39	0.30	0.56	
Control Delay	51.2	9.0	7.5	0.6	12.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	51.2	9.0	7.5	0.6	12.6	
LOS	D	A	A	A	B	
Approach Delay	30.1			1.5	12.6	
Approach LOS	C			A	B	
90th %ile Green (s)	21.5	21.5	9.6	69.5	55.4	55.4
90th %ile Term Code	Max	Max	Gap	Coord	Coord	Coord
70th %ile Green (s)	18.2	18.2	8.2	72.8	60.1	60.1
70th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
50th %ile Green (s)	15.8	15.8	7.4	75.2	63.3	63.3
50th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
30th %ile Green (s)	13.5	13.5	6.7	77.5	66.3	66.3
30th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
10th %ile Green (s)	10.0	10.0	5.9	81.0	70.6	70.6
10th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
Queue Length 50th (ft)	114	0	12	3	216	
Queue Length 95th (ft)	175	55	23	4	341	
Internal Link Dist (ft)	832			1809	1174	
Turn Bay Length (ft)						
Base Capacity (vph)	380	487	371	2661	2234	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.49	0.39	0.34	0.30	0.56	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Synchro Report - Signalized Intersections

270: Fulton Ind. Blvd & UPS Drive

Future - 2031 PM

06/27/2021

Offset: 99 (99%), Referenced to phase 2:NETL and 6:SWT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 11.2

Intersection LOS: B

Intersection Capacity Utilization 59.0%

ICU Level of Service B

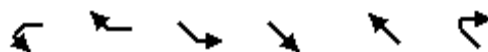
Analysis Period (min) 15

Splits and Phases: 270: Fulton Ind. Blvd & UPS Drive



Synchro Report - Signalized Intersections
280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy

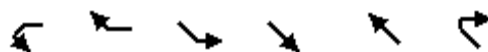
Future - 2031 PM
06/27/2021



Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	85	0	28	651	1417	0
Future Volume (vph)	85	0	28	651	1417	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	300			0
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Fr						
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1570	1652	1570	3139	3139	1652
Flt Permitted	0.950		0.071			
Satd. Flow (perm)	1570	1652	117	3139	3139	1652
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	1300			1130	416	
Travel Time (s)	29.5			25.7	9.5	
Peak Hour Factor	0.82	0.92	0.64	0.91	0.94	0.92
Growth Factor	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	15%	15%	15%	15%	15%	15%
Adj. Flow (vph)	120	0	51	830	1749	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	120	0	51	830	1749	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm

Synchro Report - Signalized Intersections
280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy

Future - 2031 PM
06/27/2021



Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Protected Phases	8		1	6	2	
Permitted Phases		8	6			2
Detector Phase	8	8	1	6	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	9.5	67.5	58.0	58.0
Total Split (%)	25.0%	25.0%	10.6%	75.0%	64.4%	64.4%
Maximum Green (s)	18.0	18.0	5.0	63.0	53.5	53.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effect Green (s)	12.1		68.9	68.9	62.4	
Actuated g/C Ratio	0.13		0.77	0.77	0.69	
v/c Ratio	0.57		0.27	0.35	0.80	
Control Delay	46.3		6.9	4.2	7.2	
Queue Delay	0.0		0.0	0.0	0.1	
Total Delay	46.3		6.9	4.2	7.3	
LOS	D		A	A	A	
Approach Delay	46.3			4.4	7.3	
Approach LOS	D			A	A	
90th %ile Green (s)	17.1	17.1	5.9	63.9	53.5	53.5
90th %ile Term Code	Gap	Gap	Max	Coord	Coord	Coord
70th %ile Green (s)	14.1	14.1	6.6	66.9	55.8	55.8
70th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
50th %ile Green (s)	12.1	12.1	6.2	68.9	58.2	58.2
50th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
30th %ile Green (s)	10.1	10.1	0.0	70.9	70.9	70.9
30th %ile Term Code	Gap	Gap	Skip	Coord	Coord	Coord
10th %ile Green (s)	7.2	7.2	0.0	73.8	73.8	73.8
10th %ile Term Code	Gap	Gap	Skip	Coord	Coord	Coord
Queue Length 50th (ft)	65		6	62	66	
Queue Length 95th (ft)	102		12	110	m#143	
Internal Link Dist (ft)	1220			1050	336	
Turn Bay Length (ft)			300			
Base Capacity (vph)	314		186	2402	2177	
Starvation Cap Reductn	0		0	0	43	
Spillback Cap Reductn	0		0	102	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.38		0.27	0.36	0.82	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 66 (73%), Referenced to phase 2:NWT and 6:SETL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 8.1

Intersection LOS: A

Intersection Capacity Utilization 58.4%

ICU Level of Service B

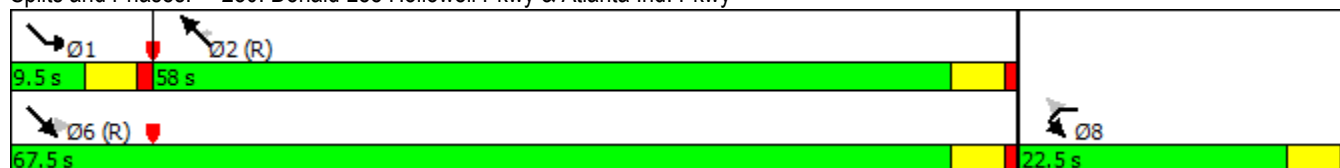
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.






















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 280: Donald Lee Hollowell Pkwy & Atlanta Ind. Pkwy















Synchro Report - Signalized Intersections
290: Fulton Ind. Blvd & Donald Lee Hollowell Pkwy

Future - 2031 PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	55	807	100	230	1328	0	55	148	0	16	203	127
Future Volume (vph)	55	807	100	230	1328	0	55	148	0	16	203	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	300		0	300		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850								0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1570	3139	1404	1570	3139	0	1570	3139	0	1570	2957	0
Flt Permitted	0.113			0.121			0.270			0.611		
Satd. Flow (perm)	187	3139	1404	200	3139	0	446	3139	0	1009	2957	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182								142	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		416			899			1051			1138	
Travel Time (s)		9.5			20.4			23.9			25.9	
Peak Hour Factor	0.98	0.93	0.92	0.82	0.95	0.92	0.92	0.76	0.92	0.67	0.88	0.86
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
Adj. Flow (vph)	65	1007	126	325	1622	0	69	226	0	28	268	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	1007	126	325	1622	0	69	226	0	28	439	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	

Synchro Report - Signalized Intersections
290: Fulton Ind. Blvd & Donald Lee Hollowell Pkwy

Future - 2031 PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2			4			8		
Detector Phase	1	6	6	5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	38.8	38.8	19.2	48.5		9.5	22.5		9.5	22.5	
Total Split (%)	10.6%	43.1%	43.1%	21.3%	53.9%		10.6%	25.0%		10.6%	25.0%	
Maximum Green (s)	5.0	34.3	34.3	14.7	44.0		5.0	18.0		5.0	18.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)		11.0	11.0		11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effct Green (s)	43.8	38.1	38.1	58.9	50.7		20.3	18.3		18.5	14.5	
Actuated g/C Ratio	0.49	0.42	0.42	0.65	0.56		0.23	0.20		0.21	0.16	
v/c Ratio	0.36	0.76	0.18	0.86	0.92		0.43	0.36		0.12	0.74	
Control Delay	20.2	27.5	1.8	32.9	31.1		32.7	32.1		24.3	31.7	
Queue Delay	0.0	0.3	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	20.2	27.8	1.8	32.9	31.1		32.7	32.1		24.3	31.7	
LOS	C	C	A	C	C		C	C		C	C	
Approach Delay		24.7			31.4			32.3			31.2	
Approach LOS		C			C			C			C	
90th %ile Green (s)	5.0	34.3	34.3	14.7	44.0		5.0	18.0		5.0	18.0	
90th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Max	Max	
70th %ile Green (s)	5.3	34.3	34.3	15.0	44.0		5.0	17.7		5.0	17.7	
70th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Max	Gap	
50th %ile Green (s)	6.9	34.3	34.3	18.0	45.4		5.0	24.2		0.0	14.7	
50th %ile Term Code	Gap	Coord	Coord	Max	Coord		Max	Hold		Skip	Gap	
30th %ile Green (s)	6.2	34.5	34.5	20.0	48.3		5.0	22.0		0.0	12.5	
30th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Max	Hold		Skip	Gap	
10th %ile Green (s)	0.0	52.9	52.9	14.2	71.6		0.0	9.4		0.0	9.4	
10th %ile Term Code	Skip	Coord	Coord	Gap	Coord		Skip	Hold		Skip	Gap	
Queue Length 50th (ft)	11	277	2	164	~426		30	53		12	84	
Queue Length 95th (ft)	37	#364	14	m#195	m#577		60	77		23	126	
Internal Link Dist (ft)		336			819			971			1058	
Turn Bay Length (ft)	200		200	300			300			200		
Base Capacity (vph)	179	1327	698	381	1766		162	698		238	705	
Starvation Cap Reductn	0	52	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.36	0.79	0.18	0.85	0.92		0.43	0.32		0.12	0.62	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 76 (84%), Referenced to phase 2:NWTL and 6:SETL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 29.4

Intersection LOS: C

Intersection Capacity Utilization 77.1%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.


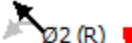




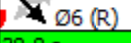



Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 290: Fulton Ind. Blvd & Donald Lee Hollowell Pkwy

 Ø1	 Ø2 (R) 	 Ø3	 Ø4
9.5 s	48.5 s	9.5 s	22.5 s
 Ø5	 Ø6 (R) 	 Ø7	 Ø8
19.2 s	38.8 s	9.5 s	22.5 s













Synchro Report - Signalized Intersections
300: Bolton Rd & Donald Lee Hollowell Pkwy

Future - 2031 PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	6	931	45	118	1395	42	32	49	63	46	73	49
Future Volume (vph)	6	931	45	118	1395	42	32	49	63	46	73	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993			0.996			0.941			0.960	
Flt Protected	0.950			0.950				0.989			0.986	
Satd. Flow (prot)	1805	3301	0	1787	3188	0	0	1734	0	0	1758	0
Flt Permitted	0.077			0.135				0.818			0.780	
Satd. Flow (perm)	146	3301	0	254	3188	0	0	1434	0	0	1391	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			6			39			21	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		899			304			783			722	
Travel Time (s)		20.4			6.9			17.8			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.78	0.78	0.78	0.95	0.95	0.95	0.88	0.88	0.88
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	0%	9%	0%	1%	13%	5%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	8	1200	58	175	2075	62	39	60	77	61	96	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	1258	0	175	2137	0	0	176	0	0	222	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	

Synchro Report - Signalized INTERsections
300: Bolton Rd & Donald Lee Hollowell Pkwy

Future - 2031 PM
06/27/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	9.5	51.7		15.8	58.0		22.5	22.5		22.5	22.5	
Total Split (%)	10.6%	57.4%		17.6%	64.4%		25.0%	25.0%		25.0%	25.0%	
Maximum Green (s)	5.0	47.2		11.3	53.5		18.0	18.0		18.0	18.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	57.1	51.9		65.0	63.1			16.0			16.0	
Actuated g/C Ratio	0.63	0.58		0.72	0.70			0.18			0.18	
v/c Ratio	0.04	0.66		0.53	0.96			0.61			0.84	
Control Delay	1.7	4.1		12.5	18.3			35.6			58.9	
Queue Delay	0.0	0.1		0.0	0.0			0.0			0.0	
Total Delay	1.7	4.3		12.6	18.3			35.6			58.9	
LOS	A	A		B	B			D			E	
Approach Delay		4.3			17.9			35.6			58.9	
Approach LOS		A			B			D			E	
90th %ile Green (s)	5.0	47.2		11.3	53.5		18.0	18.0		18.0	18.0	
90th %ile Term Code	Max	Coord		Max	Coord		Max	Max		Max	Max	
70th %ile Green (s)	0.0	49.2		9.3	63.0		18.0	18.0		18.0	18.0	
70th %ile Term Code	Skip	Coord		Gap	Coord		Hold	Hold		Max	Max	
50th %ile Green (s)	0.0	50.1		8.4	63.0		18.0	18.0		18.0	18.0	
50th %ile Term Code	Skip	Coord		Gap	Coord		Hold	Hold		Max	Max	
30th %ile Green (s)	0.0	53.8		7.4	65.7		15.3	15.3		15.3	15.3	
30th %ile Term Code	Skip	Coord		Gap	Coord		Hold	Hold		Gap	Gap	
10th %ile Green (s)	0.0	59.4		6.2	70.1		10.9	10.9		10.9	10.9	
10th %ile Term Code	Skip	Coord		Gap	Coord		Hold	Hold		Gap	Gap	
Queue Length 50th (ft)	0	39		16	197			70			109	
Queue Length 95th (ft)	m1	49		m38	#684			137			#211	
Internal Link Dist (ft)		819			224			703			642	
Turn Bay Length (ft)	400			150								
Base Capacity (vph)	188	1908		375	2235			318			295	
Starvation Cap Reductn	0	0		4	0			0			0	
Spillback Cap Reductn	0	94		0	0			1			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.04	0.69		0.47	0.96			0.56			0.75	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 87 (97%), Referenced to phase 2:NWTL and 6:SETL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 16.6

Intersection LOS: B

Intersection Capacity Utilization 77.4%

ICU Level of Service D

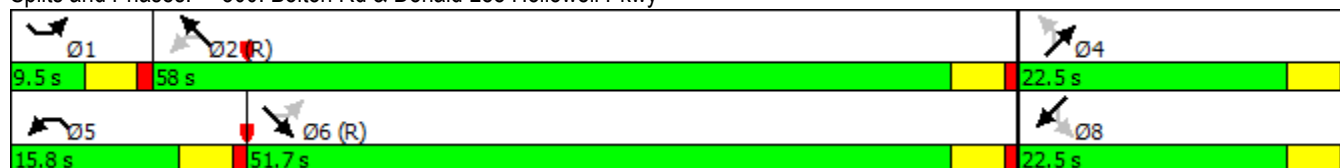
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 300: Bolton Rd & Donald Lee Hollowell Pkwy














Synchro Report - Signalized Intersections
310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp

Future - 2031 PM
06/27/2021

											
Lane Group	NBL	NBR	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR
Lane Configurations											
Traffic Volume (vph)	0	0	0	643	389	160	1141	0	128	0	429
Future Volume (vph)	0	0	0	643	389	160	1141	0	128	0	429
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00
Frnt				0.943							0.850
Flt Protected						0.950			0.950		
Satd. Flow (prot)	0	0	0	3149	0	1467	3343	0	2694	0	1335
Flt Permitted						0.102			0.950		
Satd. Flow (perm)	0	0	0	3149	0	158	3343	0	2694	0	1335
Right Turn on Red					Yes			Yes			Yes
Satd. Flow (RTOR)				165							73
Link Speed (mph)	30			30			30			30	
Link Distance (ft)	922			304			568			593	
Travel Time (s)	21.0			6.9			12.9			13.5	
Peak Hour Factor	0.92	0.92	0.95	0.95	0.95	0.96	0.96	0.96	0.95	0.95	0.95
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	2%	2%	2%	10%	5%	23%	8%	2%	30%	2%	21%
Adj. Flow (vph)	0	0	0	785	475	193	1379	0	156	0	524
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	0	1260	0	193	1379	0	156	0	524
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			24			24			24	
Link Offset(ft)	0			0			0			0	
Crosswalk Width(ft)	16			16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15		9	15		9	15	15	9
Number of Detectors				2		1	2		1		1
Detector Template				Thru		Left	Thru		Left		Right
Leading Detector (ft)				100		20	100		20		20
Trailing Detector (ft)				0		0	0		0		0
Detector 1 Position(ft)				0		0	0		0		0
Detector 1 Size(ft)				6		20	6		20		20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)				0.0		0.0	0.0		0.0		0.0
Detector 1 Queue (s)				0.0		0.0	0.0		0.0		0.0
Detector 1 Delay (s)				0.0		0.0	0.0		0.0		0.0
Detector 2 Position(ft)				94			94				
Detector 2 Size(ft)				6			6				
Detector 2 Type				Cl+Ex			Cl+Ex				
Detector 2 Channel											
Detector 2 Extend (s)				0.0			0.0				
Turn Type				NA		pm+pt	NA		Prot		Perm
Protected Phases				6		5	2		3		
Permitted Phases						2					8
Detector Phase				6		5	2		3		8

Synchro Report - Signalized Intersections
310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp

Future - 2031 PM
06/27/2021

											
Lane Group	NBL	NBR	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR
Switch Phase											
Minimum Initial (s)				5.0		5.0	5.0		5.0		5.0
Minimum Split (s)				22.5		9.5	22.5		9.5		22.5
Total Split (s)				39.4		13.8	53.2		36.8		36.8
Total Split (%)				43.8%		15.3%	59.1%		40.9%		40.9%
Maximum Green (s)				34.9		9.3	48.7		32.3		32.3
Yellow Time (s)				3.5		3.5	3.5		3.5		3.5
All-Red Time (s)				1.0		1.0	1.0		1.0		1.0
Lost Time Adjust (s)				0.0		0.0	0.0		0.0		0.0
Total Lost Time (s)				4.5		4.5	4.5		4.5		4.5
Lead/Lag				Lag		Lead					
Lead-Lag Optimize?				Yes		Yes					
Vehicle Extension (s)				3.0		3.0	3.0		3.0		3.0
Recall Mode				C-Min		None	C-Min		None		None
Walk Time (s)				7.0			7.0				7.0
Flash Dont Walk (s)				11.0			11.0				11.0
Pedestrian Calls (#/hr)				0			0				0
Act Effect Green (s)				34.9		48.7	48.7		32.3		32.3
Actuated g/C Ratio				0.39		0.54	0.54		0.36		0.36
v/c Ratio				0.95		0.88	0.76		0.16		1.00
Control Delay				25.0		49.1	6.8		20.2		65.8
Queue Delay				8.1		0.0	0.5		0.0		33.5
Total Delay				33.1		49.1	7.2		20.2		99.3
LOS				C		D	A		C		F
Approach Delay				33.1			12.4			81.2	
Approach LOS				C			B			F	
90th %ile Green (s)				34.9		9.3	48.7		32.3		32.3
90th %ile Term Code				Coord		Max	Coord		Hold		Max
70th %ile Green (s)				34.9		9.3	48.7		32.3		32.3
70th %ile Term Code				Coord		Max	Coord		Hold		Max
50th %ile Green (s)				34.9		9.3	48.7		32.3		32.3
50th %ile Term Code				Coord		Max	Coord		Hold		Max
30th %ile Green (s)				34.9		9.3	48.7		32.3		32.3
30th %ile Term Code				Coord		Max	Coord		Hold		Max
10th %ile Green (s)				34.9		9.3	48.7		32.3		32.3
10th %ile Term Code				Coord		Max	Coord		Hold		Max
Queue Length 50th (ft)				77		44	7		30		261
Queue Length 95th (ft)				#456		m#118	16		52		#481
Internal Link Dist (ft)	842			224			488			513	
Turn Bay Length (ft)											
Base Capacity (vph)				1322		220	1808		966		525
Starvation Cap Reductn				65		0	60		0		0
Spillback Cap Reductn				0		0	124		0		48
Storage Cap Reductn				0		0	0		0		0
Reduced v/c Ratio				1.00		0.88	0.82		0.16		1.10
Intersection Summary											
Area Type:	Other										
Cycle Length: 90											

Synchro Report - Signalized Intersections
 310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp

Future - 2031 PM
 06/27/2021

Actuated Cycle Length: 90

Offset: 6 (7%), Referenced to phase 2:NWTL and 6:SET, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 33.1

Intersection LOS: C

Intersection Capacity Utilization 74.9%

ICU Level of Service D

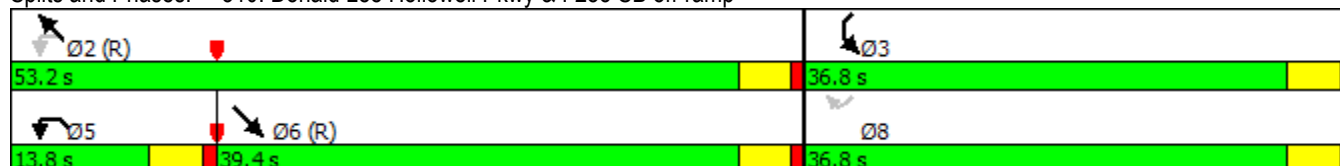
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 310: Donald Lee Hollowell Pkwy & I-285 SB off-ramp














Synchro Report - Signalized Intersections
320: I-285 NB off-ramp & Donald Lee Hollowell Pkwy

Future - 2031 PM
06/27/2021

											
Lane Group	SBL	SBR	SEL	SET	SER	NWL	NWT	NWR	NEL2	NEL	NER
Lane Configurations											
Traffic Volume (vph)	0	0	332	427	0	0	702	142	576	0	246
Future Volume (vph)	0	0	332	427	0	0	702	142	576	0	246
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	300		0	0		0		0	0
Storage Lanes	0	0	1		0	0		0		2	1
Taper Length (ft)	25		25			25				25	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt							0.975				0.850
Flt Protected			0.950						0.950		
Satd. Flow (prot)	0	0	1504	3167	0	0	4542	0	3213	0	1262
Flt Permitted			0.124						0.950		
Satd. Flow (perm)	0	0	196	3167	0	0	4542	0	3213	0	1262
Right Turn on Red					Yes			Yes			Yes
Satd. Flow (RTOR)							46				348
Link Speed (mph)	30			30			30			30	
Link Distance (ft)	782			568			1114			887	
Travel Time (s)	17.8			12.9			25.3			20.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.86	0.86	0.86
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	2%	2%	20%	14%	2%	2%	10%	18%	9%	2%	28%
Adj. Flow (vph)	0	0	419	538	0	0	885	179	777	0	332
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	419	538	0	0	1064	0	777	0	332
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			12			12			24	
Link Offset(ft)	0			0			0			0	
Crosswalk Width(ft)	16			16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15		9	15		9	15	15	9
Number of Detectors			1	2			2		1		1
Detector Template			Left	Thru			Thru		Left		Right
Leading Detector (ft)			20	100			100		20		20
Trailing Detector (ft)			0	0			0		0		0
Detector 1 Position(ft)			0	0			0		0		0
Detector 1 Size(ft)			20	6			6		20		20
Detector 1 Type			Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex		Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)			0.0	0.0			0.0		0.0		0.0
Detector 1 Queue (s)			0.0	0.0			0.0		0.0		0.0
Detector 1 Delay (s)			0.0	0.0			0.0		0.0		0.0
Detector 2 Position(ft)				94			94				
Detector 2 Size(ft)				6			6				
Detector 2 Type				Cl+Ex			Cl+Ex				
Detector 2 Channel											
Detector 2 Extend (s)				0.0			0.0				
Turn Type			pm+pt	NA			NA		Prot		Perm

Synchro Report - Signalized Intersections
320: I-285 NB off-ramp & Donald Lee Hollowell Pkwy

Future - 2031 PM
06/27/2021

											
Lane Group	SBL	SBR	SEL	SET	SER	NWL	NWT	NWR	NEL2	NEL	NER
Protected Phases			5	2			6		3		
Permitted Phases			2								3
Detector Phase			5	2			6		3		3
Switch Phase											
Minimum Initial (s)			5.0	5.0			5.0		5.0		5.0
Minimum Split (s)			9.5	22.5			22.5		9.5		9.5
Total Split (s)			31.2	59.4			28.2		30.6		30.6
Total Split (%)			34.7%	66.0%			31.3%		34.0%		34.0%
Maximum Green (s)			26.7	54.9			23.7		26.1		26.1
Yellow Time (s)			3.5	3.5			3.5		3.5		3.5
All-Red Time (s)			1.0	1.0			1.0		1.0		1.0
Lost Time Adjust (s)			0.0	0.0			0.0		0.0		0.0
Total Lost Time (s)			4.5	4.5			4.5		4.5		4.5
Lead/Lag			Lead				Lag				
Lead-Lag Optimize?			Yes				Yes				
Vehicle Extension (s)			3.0	3.0			3.0		3.0		3.0
Recall Mode			Min	C-Min			C-Min		None		None
Walk Time (s)				7.0			7.0				
Flash Dont Walk (s)				11.0			11.0				
Pedestrian Calls (#/hr)				0			0				
Act Effct Green (s)			55.9	55.9			28.4		25.1		25.1
Actuated g/C Ratio			0.62	0.62			0.32		0.28		0.28
v/c Ratio			0.92	0.27			0.73		0.87		0.55
Control Delay			28.2	4.8			31.1		42.4		6.4
Queue Delay			0.0	0.0			0.0		0.0		0.0
Total Delay			28.2	4.8			31.1		42.4		6.4
LOS			C	A			C		D		A
Approach Delay				15.1			31.1			31.6	
Approach LOS				B			C			C	
90th %ile Green (s)			26.7	54.9			23.7		26.1		26.1
90th %ile Term Code			Max	Coord			Coord		Max		Max
70th %ile Green (s)			26.7	54.9			23.7		26.1		26.1
70th %ile Term Code			Max	Coord			Coord		Max		Max
50th %ile Green (s)			26.1	54.9			24.3		26.1		26.1
50th %ile Term Code			Gap	Coord			Coord		Max		Max
30th %ile Green (s)			21.3	55.7			29.9		25.3		25.3
30th %ile Term Code			Gap	Coord			Coord		Gap		Gap
10th %ile Green (s)			14.0	59.1			40.6		21.9		21.9
10th %ile Term Code			Gap	Coord			Coord		Gap		Gap
Queue Length 50th (ft)			134	61			201		212		0
Queue Length 95th (ft)			m186	m69			#276		266		44
Internal Link Dist (ft)	702			488			1034			807	
Turn Bay Length (ft)			300								
Base Capacity (vph)			509	1966			1466		931		613
Starvation Cap Reductn			0	0			0		0		0
Spillback Cap Reductn			0	0			0		0		0
Storage Cap Reductn			0	0			0		0		0
Reduced v/c Ratio			0.82	0.27			0.73		0.83		0.54

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 65 (72%), Referenced to phase 2:SETL and 6:NWT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 26.4

Intersection LOS: C

Intersection Capacity Utilization 74.9%

ICU Level of Service D

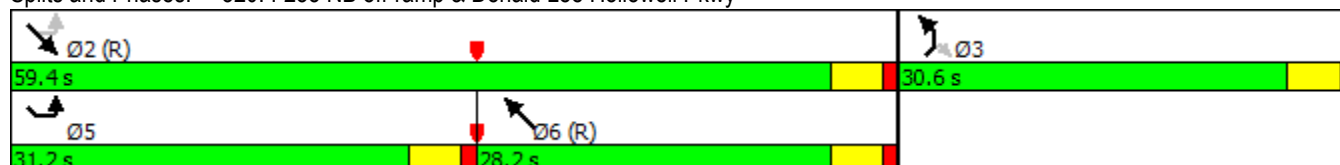
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.




















Splits and Phases: 320: I-285 NB off-ramp & Donald Lee Hollowell Pkwy



Synchro Report - Signal Improvements 2031 AM













Synchro Report - Signal Improvements
170: Patton Dr.

2031 AM
06/28/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	51	0	0	527	0	175	2432	0	17	1647	0
Future Volume (vph)	0	51	0	0	527	0	175	2432	0	17	1647	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		0	300		0
Storage Lanes	0		0	0		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	0.97	0.91	1.00	1.00	0.91	1.00
Frt												
Flt Protected							0.950			0.950		
Satd. Flow (prot)	0	1863	0	0	3539	0	3433	5085	0	1770	5085	1863
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1863	0	0	3539	0	3433	5085	0	1770	5085	1863
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		749			928			950			975	
Travel Time (s)		17.0			21.1			21.6			22.2	
Peak Hour Factor	0.85	0.85	0.85	0.92	0.88	0.92	0.47	0.88	0.92	0.53	0.73	0.92
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Adj. Flow (vph)	0	70	0	0	695	0	432	3206	0	37	2617	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	695	0	432	3206	0	37	2617	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA			NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	

Synchro Report - Signal Improvements
170: Patton Dr.

2031 AM
06/28/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	4			8								6
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	22.5
Total Split (s)	26.0	26.0		26.0	26.0		19.3	74.5		9.5	64.7	64.7
Total Split (%)	23.6%	23.6%		23.6%	23.6%		17.5%	67.7%		8.6%	58.8%	58.8%
Maximum Green (s)	21.5	21.5		21.5	21.5		14.8	70.0		5.0	60.2	60.2
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0			0	0
Act Effect Green (s)		21.5			21.5		14.8	73.8		5.0	60.2	
Actuated g/C Ratio		0.20			0.20		0.13	0.67		0.05	0.55	
v/c Ratio		0.19			1.01		0.94	0.94		0.46	0.94	
Control Delay		38.7			80.3		76.6	24.2		69.9	31.6	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		38.7			80.3		76.6	24.2		69.9	31.6	
LOS		D			F		E	C		E	C	
Approach Delay		38.7			80.3			30.4			32.2	
Approach LOS		D			F			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 36.1







Intersection LOS: D

Intersection Capacity Utilization 86.8%

ICU Level of Service E

























Analysis Period (min) 15













Splits and Phases: 170: Patton Dr.

		
Ø1	Ø2 (R)	Ø4
9.5 s	74.5 s	26 s
		
Ø5	Ø6 (R)	Ø8
19.3 s	64.7 s	26 s

Synchro Report - Signal Improvements
240: MLK Jr. Dr.

2031 AM
06/28/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	333	847	831	119	258	20	360	728	159	35	387	76
Future Volume (vph)	333	847	831	119	258	20	360	728	159	35	387	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	250		400	350		0	300		0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3273	3505	1553	3183	3539	1538	3335	3223	1455	3072	4359	1538
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3273	3505	1553	3183	3539	1538	3335	3223	1455	3072	4359	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			421			152			162			152
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1101			1180			1498			1729	
Travel Time (s)		25.0			26.8			34.0			39.3	
Peak Hour Factor	0.91	0.91	0.91	0.81	0.81	0.81	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	7%	3%	4%	10%	2%	5%	5%	12%	11%	14%	19%	5%
Adj. Flow (vph)	424	1080	1059	170	369	29	435	880	192	42	468	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	424	1080	1059	170	369	29	435	880	192	42	468	92
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	30.7	75.0	75.0	12.6	56.9	56.9	26.7	42.9	42.9	9.5	25.7	25.7
Total Split (%)	21.9%	53.6%	53.6%	9.0%	40.6%	40.6%	19.1%	30.6%	30.6%	6.8%	18.4%	18.4%
Maximum Green (s)	26.2	70.5	70.5	8.1	52.4	52.4	22.2	38.4	38.4	5.0	21.2	21.2
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	22.5	70.6	70.6	8.1	56.2	56.2	21.0	38.4	38.4	5.0	20.4	20.4
Actuated g/C Ratio	0.16	0.51	0.51	0.06	0.41	0.41	0.15	0.28	0.28	0.04	0.15	0.15
v/c Ratio	0.80	0.60	1.06	0.91	0.26	0.04	0.86	0.98	0.37	0.38	0.73	0.26
Control Delay	67.3	26.0	66.6	110.3	28.8	0.1	74.1	75.4	11.0	76.0	63.6	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.3	26.0	66.6	110.3	28.8	0.1	74.1	75.4	11.0	76.0	63.6	2.0
LOS	E	C	E	F	C	A	E	E	B	E	E	A
Approach Delay		49.6			51.7			66.8			55.1	
Approach LOS		D			D			E			E	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 138.1

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.06

Intersection Signal Delay: 55.4









Intersection LOS: E

Intersection Capacity Utilization 83.8%

ICU Level of Service E

Analysis Period (min) 15

























Splits and Phases: 240: MLK Jr. Dr.













			
9.5 s	42.9 s	12.6 s	75 s
			
26.7 s	25.7 s	30.7 s	56.9 s

Synchro Report - Signal Improvements 2031 PM

Synchro Report - Signal Improvements
100: Fulton Ind. Blvd/Fulton Ind. Blvd. & Cascade Rd./Great SW Pkwy

2031 PM
08/06/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	50	22	327	215	10	70	99	1084	115	114	1537	8
Future Volume (vph)	50	22	327	215	10	70	99	1084	115	114	1537	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		300	300		300
Storage Lanes	1		2	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1900	2760	1736	1429	1538	1641	3252	1442	1671	3252	1380
Flt Permitted	0.746			0.732			0.048			0.123		
Satd. Flow (perm)	1390	1900	2760	1337	1429	1538	83	3252	1442	216	3252	1380
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			158			117			128			82
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			669			1465			1699	
Travel Time (s)		10.4			15.2			33.3			38.6	
Peak Hour Factor	0.67	0.67	0.67	0.97	0.97	0.97	0.95	0.95	0.95	0.82	0.82	0.82
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	2%	0%	3%	4%	33%	5%	10%	11%	12%	8%	11%	17%
Adj. Flow (vph)	87	38	566	257	12	84	121	1324	140	161	2174	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	87	38	566	257	12	84	121	1324	140	161	2174	11
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	11.1	26.1	26.1	11.0	26.0	26.0	10.9	82.5	82.5	20.4	92.0	92.0
Total Split (%)	7.9%	18.6%	18.6%	7.9%	18.6%	18.6%	7.8%	58.9%	58.9%	14.6%	65.7%	65.7%
Maximum Green (s)	6.6	21.6	21.6	6.5	21.5	21.5	6.4	78.0	78.0	15.9	87.5	87.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	28.2	21.6	21.6	28.0	21.5	21.5	89.6	83.2	83.2	97.1	87.5	87.5
Actuated g/C Ratio	0.20	0.15	0.15	0.20	0.15	0.15	0.64	0.59	0.59	0.69	0.62	0.62
v/c Ratio	0.29	0.13	1.01	0.90	0.05	0.25	0.98	0.68	0.15	0.62	1.07	0.01
Control Delay	47.0	52.5	82.9	85.7	51.5	5.1	107.9	22.2	3.2	19.3	68.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	52.5	82.9	85.7	51.5	5.1	107.9	22.2	3.2	19.3	68.2	0.0
LOS	D	D	F	F	D	A	F	C	A	B	E	A
Approach Delay		76.7			65.4			27.0			64.6	
Approach LOS		E			E			C			E	
90th %ile Green (s)	6.6	21.6	21.6	6.5	21.5	21.5	6.4	78.3	78.3	15.6	87.5	87.5
90th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Hold	Hold	Gap	Max	Max
70th %ile Green (s)	6.6	21.6	21.6	6.5	21.5	21.5	6.4	82.5	82.5	11.4	87.5	87.5
70th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Hold	Hold	Gap	Max	Max
50th %ile Green (s)	6.6	21.6	21.6	6.5	21.5	21.5	6.4	84.0	84.0	9.9	87.5	87.5
50th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Hold	Hold	Gap	Max	Max
30th %ile Green (s)	6.6	21.6	21.6	6.5	21.5	21.5	6.4	85.0	85.0	8.9	87.5	87.5
30th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Hold	Hold	Gap	Max	Max
10th %ile Green (s)	6.6	21.6	21.6	6.5	21.5	21.5	6.4	86.4	86.4	7.5	87.5	87.5
10th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Hold	Hold	Gap	Max	Max
Queue Length 50th (ft)	64	30	~227	212	9	0	63	408	4	44	~1151	0
Queue Length 95th (ft)	83	48	188	#395	30	21	#205	542	36	64	#1080	0
Internal Link Dist (ft)		378			589			1385			1619	
Turn Bay Length (ft)							300		300	300		300
Base Capacity (vph)	297	293	559	285	219	335	124	1933	909	317	2032	893
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.13	1.01	0.90	0.05	0.25	0.98	0.68	0.15	0.51	1.07	0.01

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 54.4

Intersection LOS: D

Intersection Capacity Utilization 87.6%

ICU Level of Service E

Analysis Period (min) 15

90th %ile Actuated Cycle: 140

70th %ile Actuated Cycle: 140

50th %ile Actuated Cycle: 140

30th %ile Actuated Cycle: 140

10th %ile Actuated Cycle: 140









~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.




















Queue shown is maximum after two cycles.













Splits and Phases: 100: Fulton Ind. Blvd/Fulton Ind. Blvd. & Cascade Rd./Great SW Pkwy

 Ø1	 Ø2	 Ø3	 Ø4
20.4 s	82.5 s	11 s	26.1 s
 Ø5	 Ø6	 Ø7	 Ø8
10.9 s	92 s	11.1 s	26 s

Synchro Report - Signal Improvements
170: Patton Dr.

2031 PM
06/28/2021

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	30	0	0	250	219	64	1800	0	35	1108	0
Future Volume (vph)	30	30	0	0	250	219	64	1800	0	35	1108	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		0	300		0
Storage Lanes	0		0	0		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	0.97	0.91	1.00	1.00	0.91	1.00
Frt					0.930							
Flt Protected		0.976					0.950			0.950		
Satd. Flow (prot)	0	1545	0	0	2798	0	2918	4322	0	1504	4322	1583
Flt Permitted		0.430					0.950			0.950		
Satd. Flow (perm)	0	681	0	0	2798	0	2918	4322	0	1504	4322	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					116							
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		749			928			950			975	
Travel Time (s)		17.0			21.1			21.6			22.2	
Peak Hour Factor	0.79	0.79	0.79	0.90	0.90	0.90	0.96	0.96	0.96	0.73	0.73	0.73
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Adj. Flow (vph)	44	44	0	0	322	282	77	2175	0	56	1761	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	88	0	0	604	0	77	2175	0	56	1761	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA			NA		Prot	NA		Prot	NA	Perm

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5		9.5	48.0		9.5	48.0	48.0
Total Split (%)	28.1%	28.1%		28.1%	28.1%		11.9%	60.0%		11.9%	60.0%	60.0%
Maximum Green (s)	18.0	18.0		18.0	18.0		5.0	43.5		5.0	43.5	43.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0			0	0
Act Effect Green (s)		17.2			17.2		5.1	46.2		5.2	46.2	
Actuated g/C Ratio		0.22			0.22		0.06	0.58		0.06	0.58	
v/c Ratio		0.60			0.87		0.41	0.87		0.58	0.71	
Control Delay		47.1			39.2		43.2	20.8		61.7	14.9	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		47.1			39.2		43.2	20.8		61.7	14.9	
LOS		D			D		D	C		E	B	
Approach Delay		47.1			39.2			21.6			16.4	
Approach LOS		D			D			C			B	
90th %ile Green (s)	18.0	18.0		18.0	18.0		5.0	43.5		5.0	43.5	43.5
90th %ile Term Code	Max	Max		Max	Max		Max	Coord		Max	Coord	Coord
70th %ile Green (s)	18.0	18.0		18.0	18.0		5.0	43.5		5.0	43.5	43.5
70th %ile Term Code	Max	Max		Max	Max		Max	Coord		Max	Coord	Coord
50th %ile Green (s)	18.0	18.0		18.0	18.0		5.0	43.5		5.0	43.5	43.5
50th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Max	Coord	Coord
30th %ile Green (s)	18.0	18.0		18.0	18.0		5.0	43.5		5.0	43.5	43.5
30th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Max	Coord	Coord
10th %ile Green (s)	14.2	14.2		14.2	14.2		0.0	56.8		0.0	56.8	56.8
10th %ile Term Code	Hold	Hold		Gap	Gap		Skip	Coord		Skip	Coord	Coord
Queue Length 50th (ft)		39			124		19	339		28	230	
Queue Length 95th (ft)		76			#212		41	#482		#57	201	
Internal Link Dist (ft)		669			848			870			895	
Turn Bay Length (ft)							200			300		
Base Capacity (vph)		153			719		186	2494		97	2494	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.58			0.84		0.41	0.87		0.58	0.71	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 22.3

Intersection LOS: C

Intersection Capacity Utilization 71.9%

ICU Level of Service C

























Analysis Period (min) 15













95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 170: Patton Dr.



												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	130	479	490	251	612	55	513	514	161	80	1058	229
Future Volume (vph)	130	479	490	251	612	55	513	514	161	80	1058	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	250		400	350		0	300		0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3242	3505	1553	3335	3539	1429	3303	3223	1509	3400	4759	1482
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3242	3505	1553	3335	3539	1429	3303	3223	1509	3400	4759	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			308			164			199			170
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1101			1180			1498			1729	
Travel Time (s)		25.0			26.8			34.0			39.3	
Peak Hour Factor	0.88	0.88	0.88	0.86	0.86	0.86	0.94	0.94	0.94	0.88	0.88	0.88
Growth Factor	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%	116%
Heavy Vehicles (%)	8%	3%	4%	5%	2%	13%	6%	12%	7%	3%	9%	9%
Adj. Flow (vph)	171	631	646	339	825	74	633	634	199	105	1395	302
Shared Lane Traffic (%)												
Lane Group Flow (vph)	171	631	646	339	825	74	633	634	199	105	1395	302
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	10.8	28.0	28.0	14.8	32.0	32.0	23.0	45.7	45.7	11.5	34.2	34.2
Total Split (%)	10.8%	28.0%	28.0%	14.8%	32.0%	32.0%	23.0%	45.7%	45.7%	11.5%	34.2%	34.2%
Maximum Green (s)	6.3	23.5	23.5	10.3	27.5	27.5	18.5	41.2	41.2	7.0	29.7	29.7
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effect Green (s)	6.3	23.5	23.5	10.3	27.5	27.5	18.5	43.5	43.5	6.8	29.7	29.7
Actuated g/C Ratio	0.06	0.24	0.24	0.10	0.28	0.28	0.18	0.44	0.44	0.07	0.30	0.30
v/c Ratio	0.84	0.77	1.08	0.99	0.85	0.14	1.04	0.45	0.26	0.45	0.99	0.54
Control Delay	79.4	42.8	79.9	91.9	44.0	0.6	74.7	15.3	5.0	63.8	43.3	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.4	42.8	79.9	91.9	44.0	0.6	74.7	15.3	5.0	63.8	43.3	9.1
LOS	E	D	E	F	D	A	E	B	A	E	D	A
Approach Delay		63.7			54.5			39.6			38.8	
Approach LOS		E			D			D			D	
90th %ile Green (s)	6.3	23.5	23.5	10.3	27.5	27.5	18.5	41.2	41.2	7.0	29.7	29.7
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	6.3	23.5	23.5	10.3	27.5	27.5	18.5	41.2	41.2	7.0	29.7	29.7
70th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	6.3	23.5	23.5	10.3	27.5	27.5	18.5	41.2	41.2	7.0	29.7	29.7
50th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
30th %ile Green (s)	6.3	23.5	23.5	10.3	27.5	27.5	18.5	41.2	41.2	7.0	29.7	29.7
30th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
10th %ile Green (s)	6.3	23.5	23.5	10.3	27.5	27.5	18.5	52.7	52.7	0.0	29.7	29.7
10th %ile Term Code	Max	Max	Max	Max	Hold	Hold	Max	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	56	198	~299	112	261	0	~228	172	39	32	326	75
Queue Length 95th (ft)	#111	255	#494	#190	317	0	m#334	m210	m72	m46	#415	m90
Internal Link Dist (ft)		1021			1100			1418			1649	
Turn Bay Length (ft)				250		400	350			300		
Base Capacity (vph)	204	823	600	343	973	511	611	1401	768	238	1413	559
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.77	1.08	0.99	0.85	0.14	1.04	0.45	0.26	0.44	0.99	0.54

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 98 (98%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay: 48.3

Intersection LOS: D

Intersection Capacity Utilization 79.6%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.






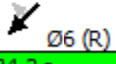



Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 240: MLK Jr. Dr.

 Ø1	 Ø2 (R) 	 Ø3	 Ø4
11.5 s	45.7 s	14.8 s	28 s
 Ø5	 Ø6 (R) 	 Ø7	 Ø8
23 s	34.2 s	10.8 s	32 s