

→ Appendix C: Equity Analysis

Regional Transportation Demand Management Plan

March 2023

**Prepared for the Atlanta Regional
Commission**



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Introduction

Driven by many of the social and economic forces of the pandemic, a focus on essential jobs and workers has elevated equity as a critical topic to address in TDM. The purpose of the equity analysis for the Regional TDM Plan was to evaluate the impact of proposed TDM strategies across the 20-County Metro Atlanta region on diverse populations based on demographic, socioeconomic, employment, and transportation characteristics. The equity analysis provides a foundation for the regional service delivery model and will help to ensure that the final, priority strategy set supports equitable outcomes for the regional TDM program. Note, the equity analysis is not a reflection of employer service organization (ESO) performance or funding needs.

In summary, the objectives of the equity analysis are to:

1. Evaluate the impact of TDM strategies across a broad income, employment, and social profile.
2. Identify opportunities for tailoring strategies to better reach underserved populations.
3. Ensure that the final, priority TDM strategy set supports equitable outcomes.

Approach and Data

The equity analysis was conducted in five key steps, outlined in Figure 1 below: identify traditionally underserved areas, define regional equity context, map TDM services in relation to underserved areas, identify overlap or gaps between existing services and transportation needs, and cross-check new strategies against gaps in coverage. The approach and findings from each step are presented in the following section.

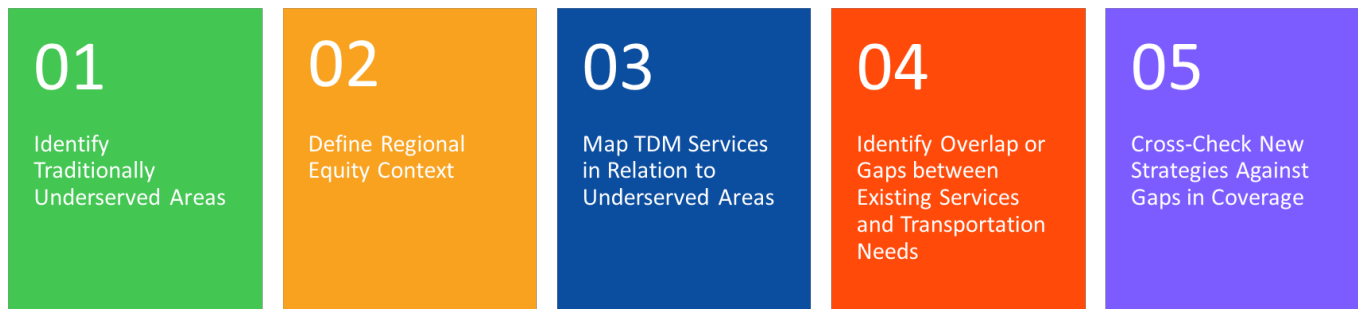


Figure 1: Equity analysis process

A variety of data sources were compiled and considered for use in the equity analysis. The final suite of data used in the assessment, presented in Table 1, reflect those sources that provided background on key equity characteristics relevant for the region or current program reach. ARC’s Comprehensive Economic Development Strategy (CEDS) index was used to derive additional metrics through “breakoff” indices, as described throughout the following section.

Table 1: Data sources referenced in building the equity analysis

Data Element	Description	Source
ARC's Comprehensive Economic Development Strategy (CEDS) index	Relies on 10 demographic and socioeconomic indicators to assess areas (at the Census tract level) most severely impacted economically due to the COVID-19 pandemic.	ARC
Disadvantaged Community designations	Labels communities as disadvantaged or not based on climate and socioeconomic indicators at the Census tract level. Used for assessing impacts of programs/projects on disadvantaged communities under the Justice40 initiative.	Council on Environmental Quality (CEQ) Climate and Economic Justice Screening Tool
Displacement, Gentrification, and Exclusion neighborhood typologies	For the inner counties of the ARC 20-county region, classifies Census tracts into neighborhood typologies related to displacement and gentrification status (e.g., susceptible to displacement, ongoing displacement, ongoing gentrification, becoming exclusive, etc.).	Urban Displacement Project
2019 Longitudinal Employer-Household Dynamics (LEHD) Origin-Destination Employment Statistics (LODES)	Provide workplace area characteristics (WAC) and residence area characteristics (RAC) for workers and jobs by industry, earnings level, etc. These datasets were aggregated to the Census tract level	Census, Center for Economic Studies
2019 Transit coverage	Stop-level coverage of the region's transit system, including Atlanta Streetcar, CobbLinc, Gwinnet County Transit, SRTA, and MARTA systems	ARC Open Data and Mapping Hub
Commuting by time of day	Defines the number of commuters by commute start time; taken at the Census tract level.	2019 American Community Survey (ACS) 5-Year estimates
Vehicle ownership	Defines the number of households by car ownership level; taken at the Census tract level.	2019 ACS 5-Year estimates
ESO/TMA boundaries	Boundaries for Georgia Commute Options (GCO), Aero ATL, Livable Buckhead, Perimeter Connects, Midtown Transportation, ASAP+, and Clifton Corridor TMA	ARC
University Transportation Pilot Program schools considered and selected	List of universities considered for the TDM program's University Transportation Pilot Program	ARC
GCO Members Home and Work locations	Aggregate (Census tract) locations where GCO members (i.e., any individuals who have been active in their GCO account in the last 24 months since February 2022) live and work	ARC

Data Element	Description	Source
Regional transportation plan (RTP) investments	Map of planned investments in the latest RTP, including those related to transit and last-mile connectivity	ARC

Equity Analysis: Stepwise Process and Findings

Step 1: Identify Traditionally Underserved Areas

As a first step in building out the equity analysis, traditionally underserved areas in the 20-county Metro Atlanta region were identified. These areas would highlight opportunities for the TDM program to improve equitable service delivery.

ARC’s Comprehensive Economic Development Strategy (CEDS) index was referenced to identify traditionally underserved areas. ARC updates the CEDS every five years, as required by the Economic Development Administration (EDA). Developed using 2019 American Community Survey (ACS) data at the Census tract level, the most recent CEDS aims to capture areas with demographic and socioeconomic characteristics that led such areas to be most severely impacted economically due to the COVID-19 pandemic. ARC sets a threshold of a CEDS score of four or more as being considered an “equitable target tract” to capture the top quartile of tract-level CEDS scores in the region. A map of the region by CEDS score is shown in Figure 2. Twenty-four percent of tracts in the region have a CEDS Index Score of 4 or more.

Given new program and funding opportunities for disadvantaged communities presented by the 2021 Infrastructure Investment and Jobs Act (IIJA) and the White House’s Justice40 initiative, ARC’s CEDS index was compared to the

[Climate and Economic Justice Screening Tool](#) (CEJST), which is currently pointed to as a reference to identify disadvantaged communities under Justice40 provisions. Of the 948 Census tracts in the 20-county region, 20% have a CEDS index score of 4 or more and are identified as disadvantaged communities by the CEJST, and 81% of tracts labeled as disadvantaged communities by CEJST also have a CEDS index score of 4 or more.

What is the CEDS Index?

ARC’s most recent CEDS index relies on 10 indicators at the Census tract level from 2019 ACS 5-Year Estimates:

- | | |
|-----------------------------------|--|
| 1. Not Hispanic, Black population | 6. Unemployment rate |
| 2. Hispanic or Latinx population | 7. Renter occupancy |
| 3. Foreign born population | 8. Cost burdened households (i.e., households who spend 30% or more of their incomes on housing costs) |
| 4. Median household income* | 9. Households with computers at home* |
| 5. Poverty rate | 10. Households with broadband internet at home* |

Each tract is scored either “0” or “1” on each of the 10 indicators if it falls within top 20% for the region (or bottom 20% for some indicators, indicated with *).

The tract’s score on the full index is the sum of all the individual scores received on each of the indicators. The full index ranges from 0-9 (no tracts scored “1” on all indicators).

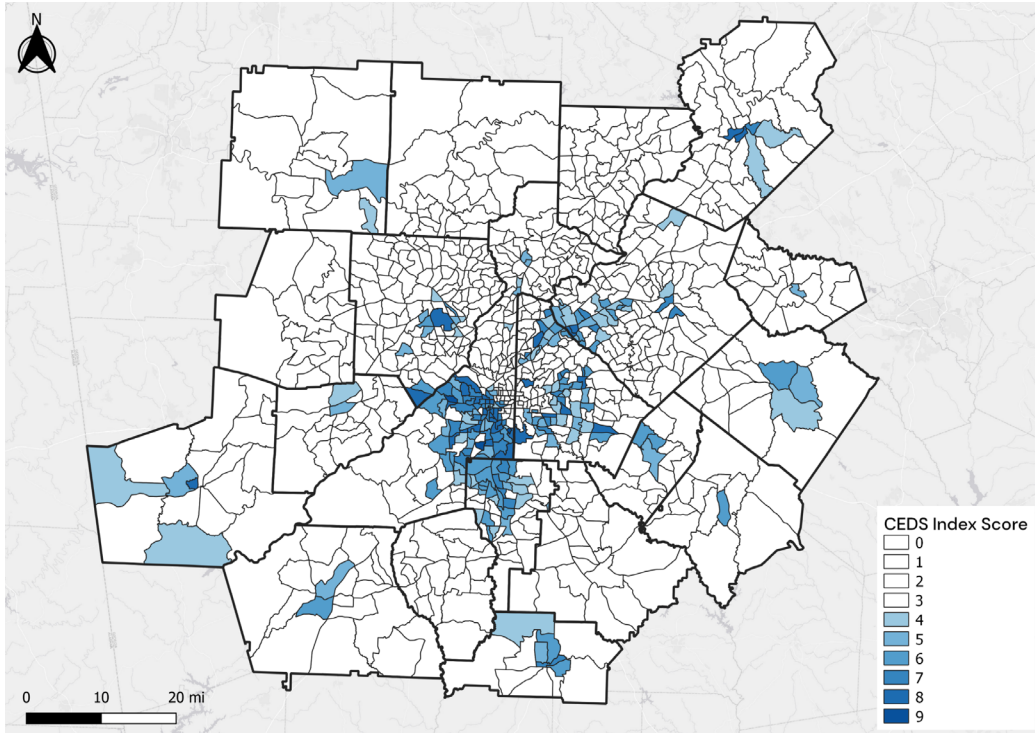


Figure 2: The Atlanta 20-County Region by CEDES score

To further identify target opportunities for the TDM program, data comprising the full CEDES index was used to build three breakoff indices. These indices were built out the same way the CEDES index was (i.e., tracts received a score of “1” if they fell into the top 20% or bottom 20% score of a specific indicator; the overall score is the sum of these individual scores), but with refined versions of indicators. Thresholds at which tracts were defined to be high-scoring on these indices were determined based on inflexion points at which these tracts exhibited higher concentrations of these populations compared to the full CEDES index. The break-off indices developed, and the indicators they relied on, included:

1. **Traditionally Underserved Index** – 17% of tracts are high-scoring (have a score of three or higher). Relies on five indicators:
 - a. Not Hispanic, Black population
 - b. Hispanic or Latinx population
 - c. Poverty Rate
 - d. Unemployment Rate
 - e. Cost burdened households (i.e., households who spend 30% or more of their incomes on housing costs)
2. **Cost-Burdened/High-Renter Occupancy Index** – 14% of tracts are high-scoring (have a score of two). Relies on two indicators:
 - a. Renter occupancy
 - b. Cost burdened households (i.e., households who spend 30% or more of their incomes on housing costs)
3. **Technology-Limited Index** – 26% of tracts are high-scoring (have a score of 1 or 2). Relies on two indicators:
 - a. Households with(out) computers at home
 - b. Households with(out) broadband internet at home

The CEDES index and break-off indices were used to identify underserved areas in the region in reference to opportunities for the new TDM program. Some additional comparisons were drawn [to Displacement, Gentrification, and Exclusion](#)

[neighborhood typologies](#) developed by the Urban Displacement Project (in collaboration with ARC and other partners) for the inner Atlanta counties.

Step 2: Define Regional Equity Context

After identifying underserved areas using the CEDS data and break-off indices, the next step was to define the regional equity context using baseline data related to transportation and commute flows. Key data sources included:

- **Census Center for Economic Studies Longitudinal Employer-Household Dynamics (LEHD) Origin-Destination Employment Statistics (LODES)** – 2019 workplace and residence area characteristics provided information about where workers by industry and earnings level live and work in the region.
- **Transit coverage** – Coverage of the region’s transit system, including Atlanta Streetcar, CobbLinc, Gwinnet County Transit, SRTA, and MARTA systems, was measured by the density of transit stops (stops per square mile), within a particular tract.
- **Off-peak commuting** – 2019 ACS 5-Year estimates were used to identify the percentage of commuters traveling from home to work outside the hours of 6 AM to 10 AM. Essential workers and shift workers may be more likely to have off-peak commutes.
- **Zero-car households** – 2019 ACS 5-Year estimates were used to identify the percentage of households in the region who do not own a vehicle.

These data sources were used to understand existing conditions in the region, as well as to evaluate TDM strategies and opportunities. In terms of existing conditions, analysis of the above sources yielded the findings listed below.

1. In the last decade, low-earning jobs have stagnated, while mid-earning jobs have begun to decline in the region.
2. Transit coverage does not extend to many low- and mid-earning jobs.
3. Not owning a car is a transportation pain point, particularly in traditionally underserved areas.
4. Off-peak commuting is observed at higher levels in traditionally underserved areas.
5. The analysis of existing conditions in the region reveals several transportation pain points.

The following subsections within Step 2 discuss these findings in greater detail with accompanying maps and graphs.

1. In the last decade, low-earning jobs have stagnated, while mid-earning jobs have begun to decline in the region.

Figure 3 shows workers by earning level from 2011 through 2019. When looking at the wages of workers living in the region over the past decade, the number of high-earning jobs (defined as those earning \$3,333 or more per month by LODES data) has risen by over half a million, while workers in low-earning jobs has stagnated, and those in mid-earning jobs have begun to decline.

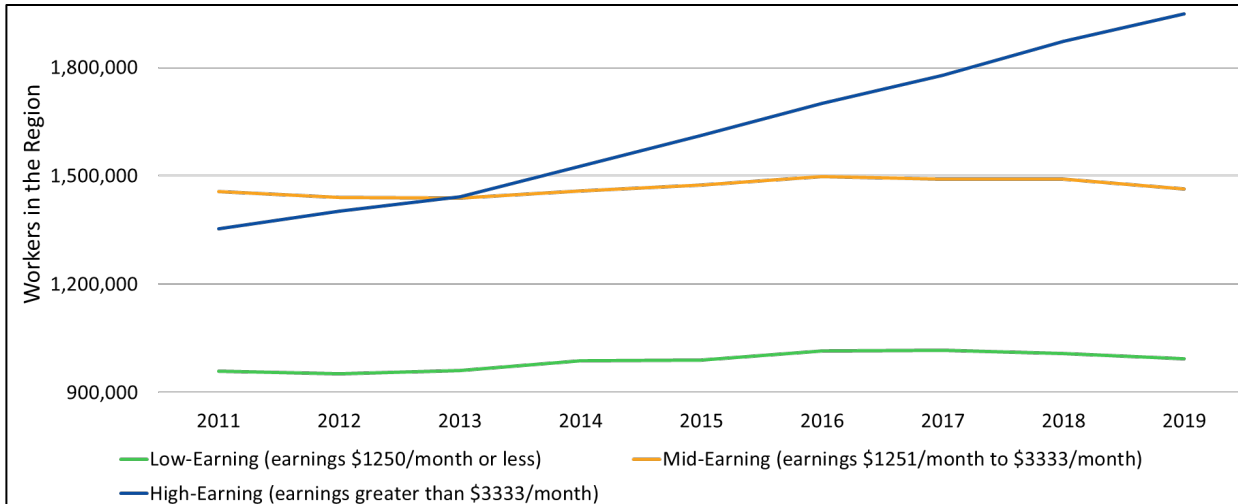


Figure 3: Workers in the Region by Job Earnings, 2011-2019

2. Transit coverage does not extend to many low- and mid-earning jobs.

Figure 4 shows the distribution of low- and mid-earning jobs by worker residence and workplace location, while Figure 5 shows transit stop density in the region. Low- and mid-earning jobs are scattered throughout the region, while the representative worker populations are concentrated. Transit service coverage in the region is also concentrated centrally, and as such, may not extend the length of many low- or mid-income workers’ commutes. Additionally, limited first-mile/last-mile connections to the transit network may limit feasibility of transit commuting.

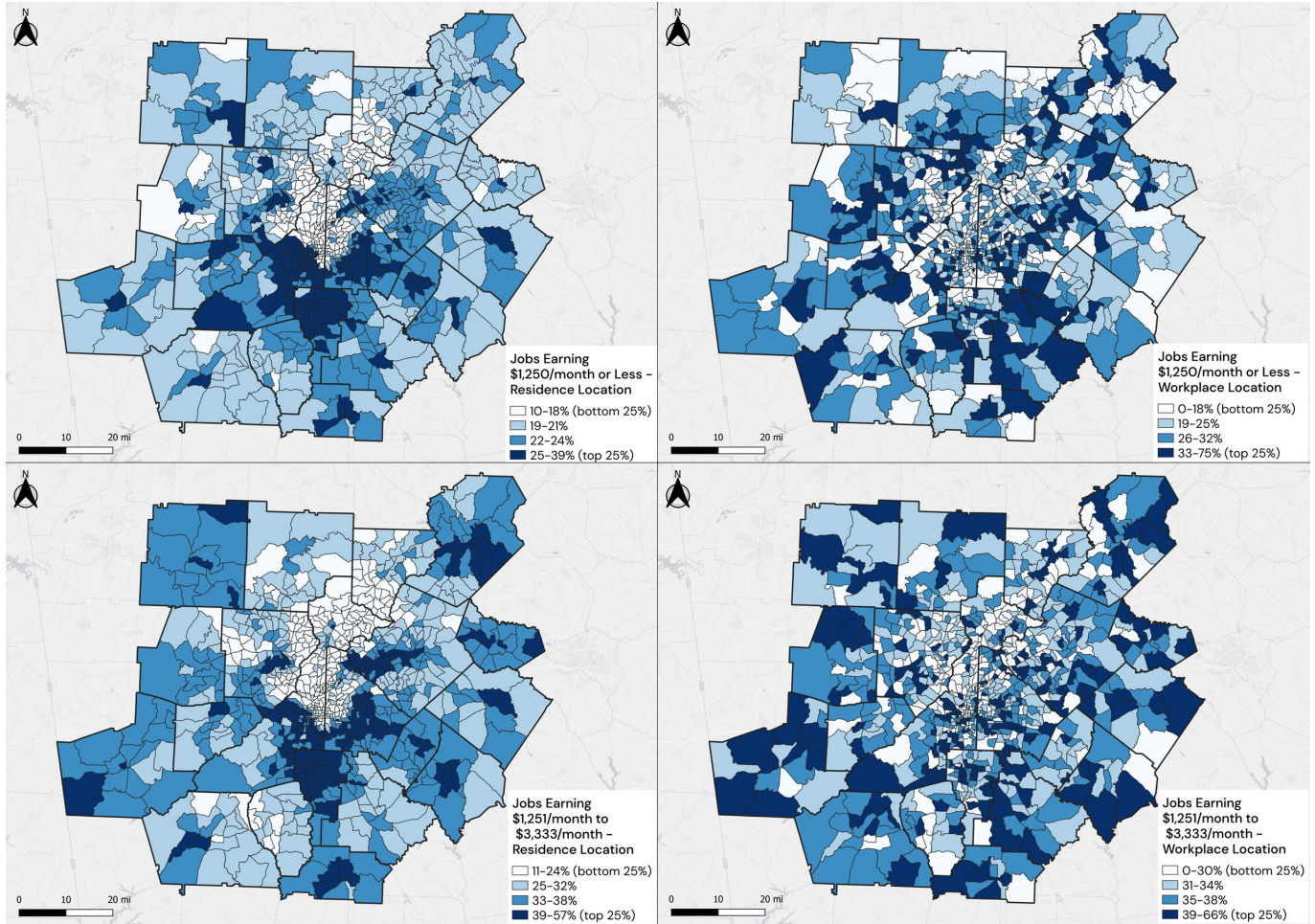


Figure 4: Distribution of Low-Income Jobs by Residence Location (top-left), Workplace Location (top-right), and Mid-Income Jobs by Residence Location (bottom-left) and Workplace Location (bottom-right)

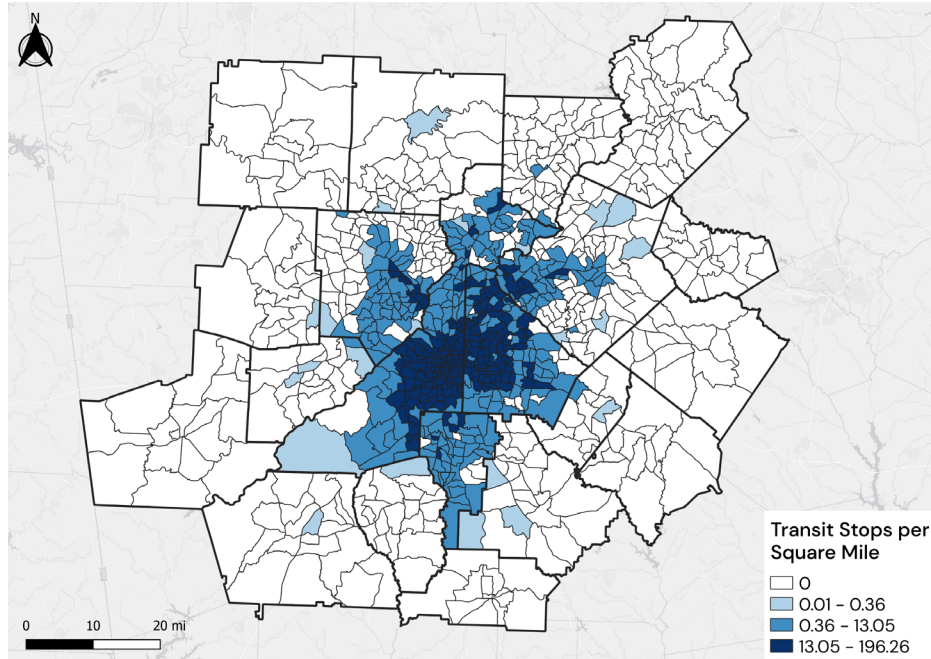


Figure 5: Regional transit stop density

3. Not owning a car is a transportation pain point, particularly in traditionally underserved areas.

The distribution of zero-car households throughout the region is shown in Figure 6. Approximately 6% of households in the region do not own a vehicle. In tracts with a Traditionally Underserved index score of 3 or more, 16% of households do not own a vehicle, compared to 4% in other tracts. Note a greater number of households in tracts may be in a “vehicle deficit” – where the household owns vehicles, but not enough for everyone in the household to regularly have access to one.

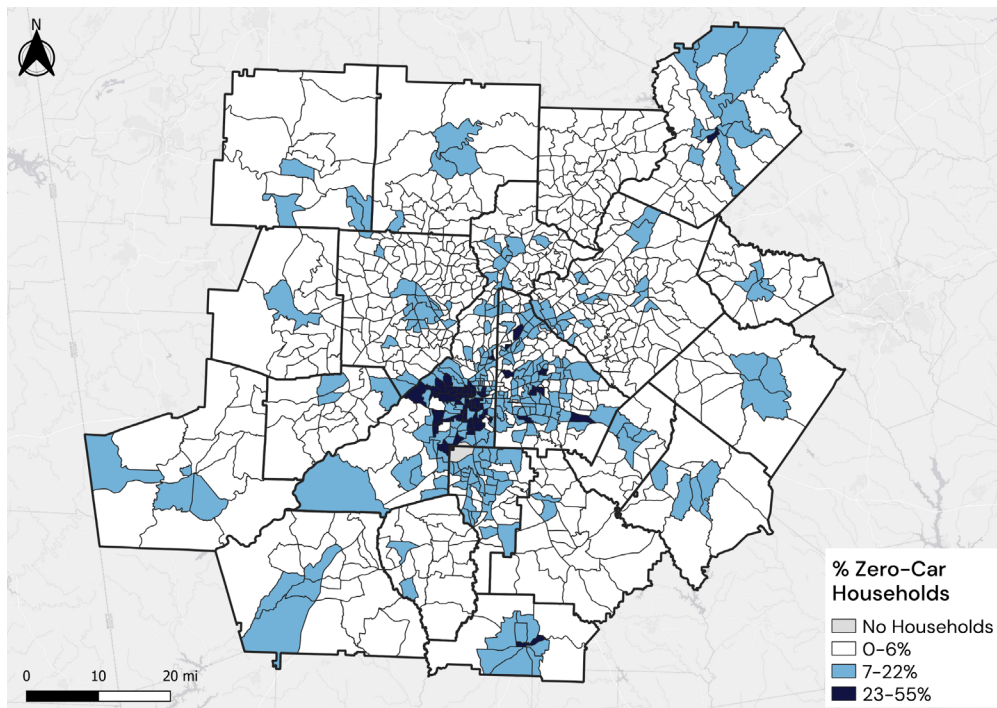


Figure 6: Zero-car households in the 20-county region

4. Off-peak commuting is observed at higher levels in traditionally underserved areas.

Thirty percent of commuters in the 20-county region commute outside the hours of 6 AM to 10 AM. In tracts with a Traditionally Underserved index score of 3 or more, 38% of commuters are off-peak commuters, compared to 29% of commuters in other tracts. Shown in Figure 7, tracts with high concentrations of workers commuting off-peak are in the periphery of the region, while tracts with highest concentrations of resident workers commuting during peak hours are located in the core and just to the north and east of the core in Fulton and DeKalb Counties.

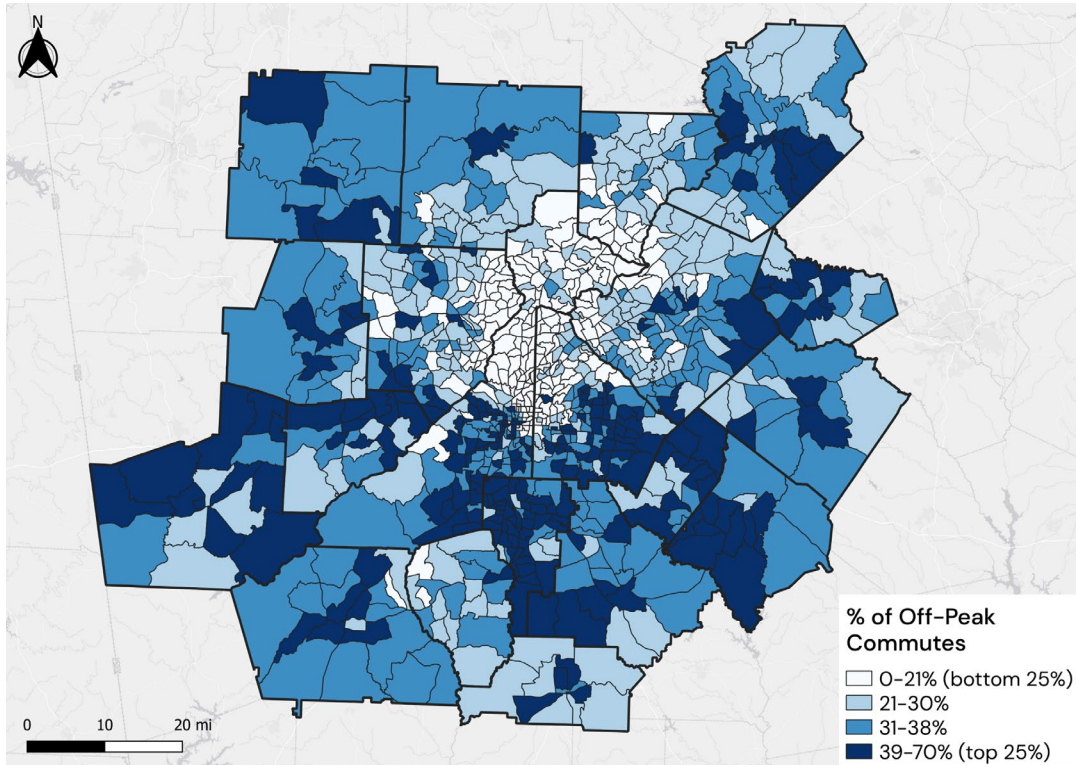


Figure 7: Off-peak commuting in the 20-county region

5. The analysis of existing conditions in the region reveals several transportation pain points.

The analysis of existing conditions and stakeholder conversations revealed several transportation pain points—or key mobility barriers—in the region. These pain points include:

- Not owning a car (zero-car households)
- Transportation expenses (cost burdened households)
- No access to transit at work or home
- No first/last mile option
- Off-peak commuting (due to less access to services)
- Information is inaccessible due to language barriers
- Information is inaccessible due to lack of technology access

These pain points were used, in combination with the analysis in Step 3, to evaluate the program’s existing strategy set in Step 4 and new proposed strategies in Step 5.

Step 3: Map TDM Services in Relation to Underserved Areas (Residential)

With the regional context from Step 2 in mind, existing TDM services – as well as RTP investments – were mapped against underserved areas and contextual data. This step directly informs the findings extracted in Steps 4 (Identify Overlap or Gaps between Existing Services and Transportation Needs) and 5 (Cross-Check New Strategies Against Gaps in Coverage).

ESO Boundaries Overlaid with CEDS Indices and Breakoff Indices First, employer service organizations (ESOs,) including Georgia Commute Options (GCO) and the region’s transportation management associations (TMAs,) were mapped overlaid on the CEDS index and breakoff indices. Recall that CEDS indices are based on residential characteristics of Census tracts. While ESOs typically target outreach to employers and employees working within their boundaries, there is opportunity for ESOs to implement residential-targeted TDM strategies, either toward CEDS populations living within ESOs or CEDS populations outside of an ESO boundary that could align to ESO employment needs. By looking at the CEDS populations, the TDM program can better target strategies that connect traditionally underserved residents to jobs and other resources. It is important to note that this is just one potential opportunity area for the new TDM program, and that the distribution of CEDS populations within each ESO boundary is not a reflection on populations currently served or not served by each ESO.

These map overlays are shown for each index of underserved areas (including the equitable target tracts, traditionally underserved areas, cost-burdened, high renter occupancy areas, and technology limited areas,) in Figure 8 through Figure 11.

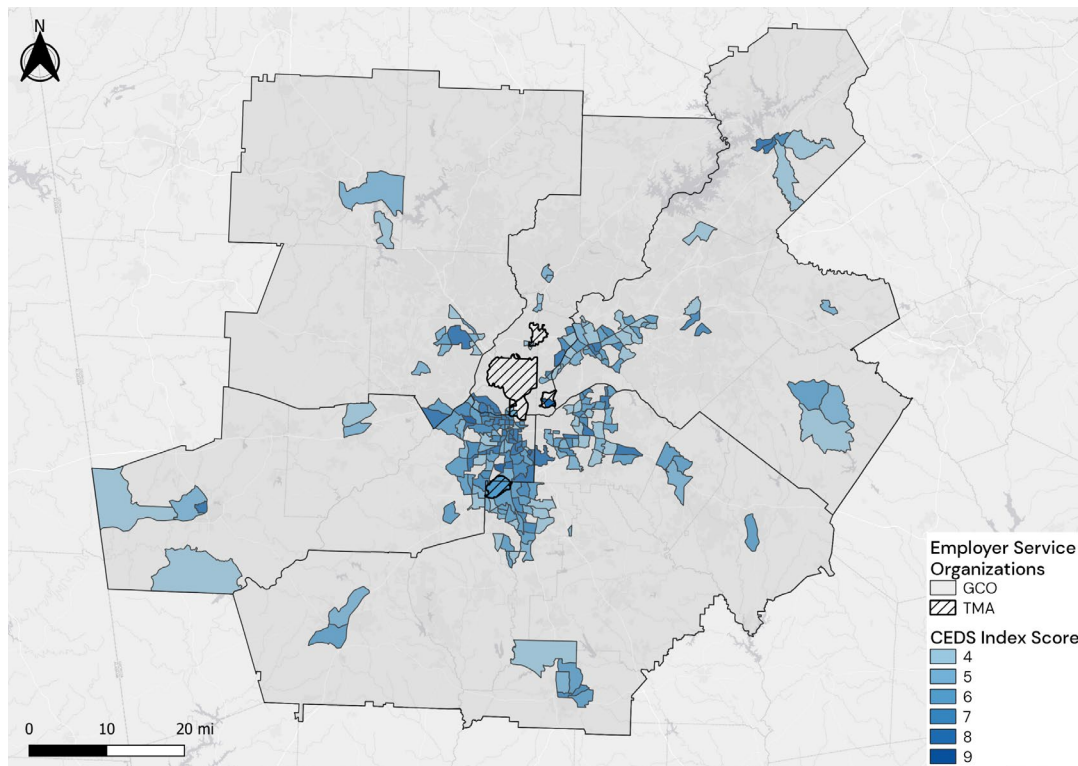


Figure 8: ESO Boundaries Overlaid on High-Scoring CEDS Index Tracts

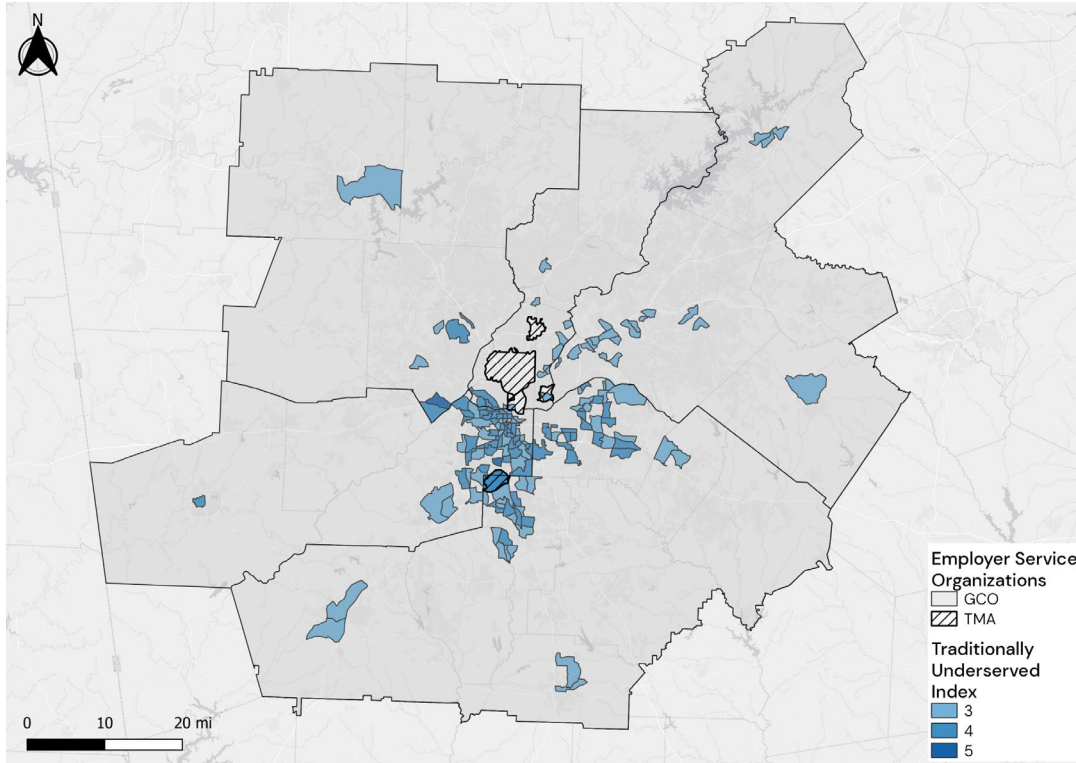


Figure 9: ESO Boundaries Overlaid on High-Scoring Traditionally Underserved Index Tracts

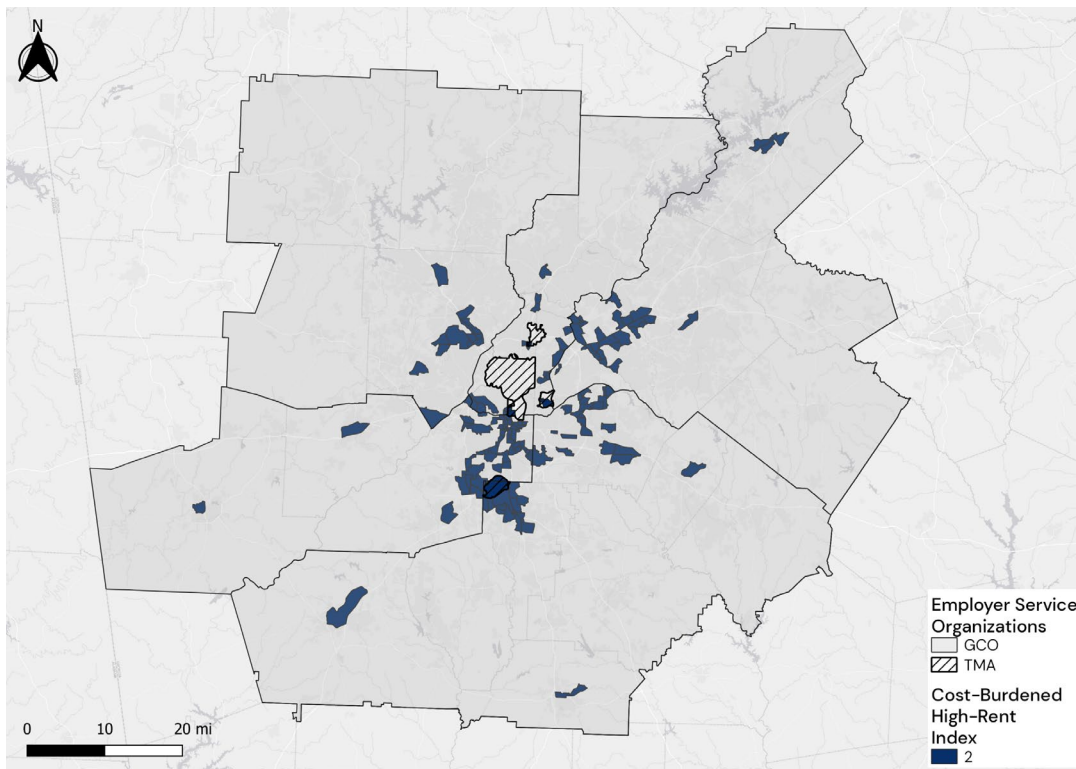


Figure 10: ESO Boundaries Overlaid on High-Scoring Cost-Burdened High-Renter Occupancy Index Tracts

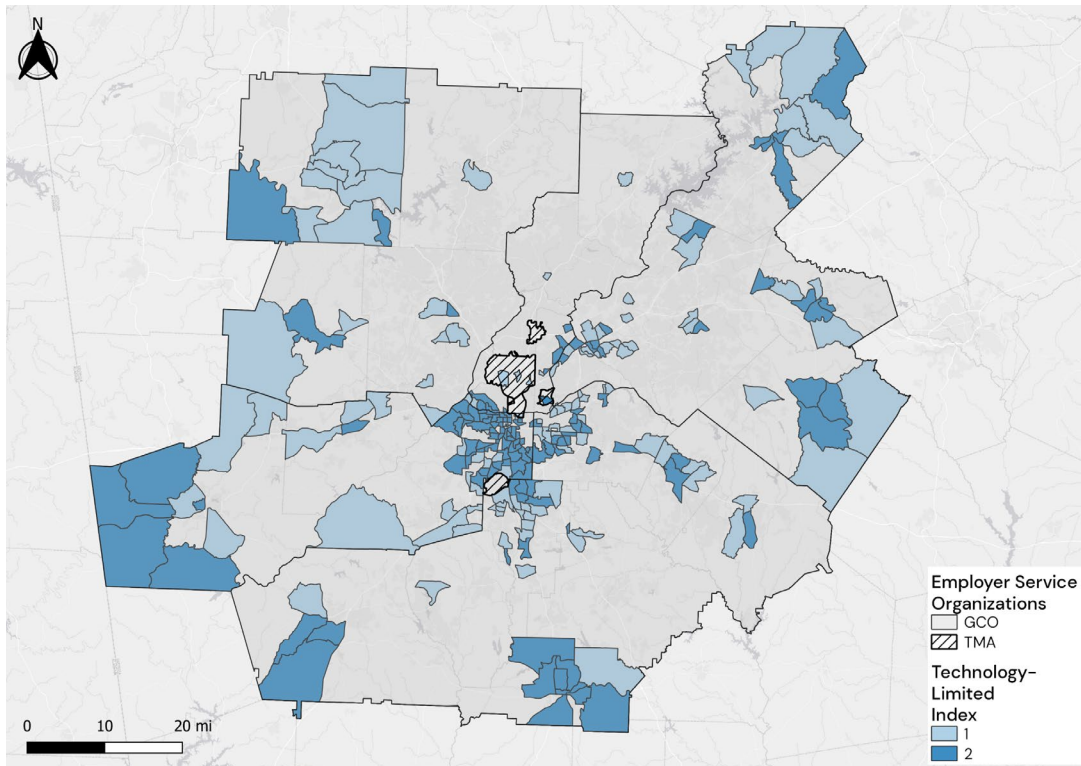


Figure 11: ESO Boundaries Overlaid on High-Scoring Technology-Limited Index Tracts

OnTheMap Overlays to Visualize Where Workers Working in Each ESO Live

Next, the web-based tool [OnTheMap](#) was used to visualize where workers working in each ESO lived, and how their home locations aligned with undeserved residential areas (identified using CEDS indices.) OnTheMap is a Census tool that enables users to visualize home-work flows. If users input home geographies of interest, OnTheMap can provide information on where workers who live in those geographies work. Conversely, if users input workplace geographies of interest, OnTheMap can provide information on where workers who work in those areas live.

Since ESOs typically target employees working within their boundaries, ESO boundaries were input to OnTheMap as workplace geographies. Then, these home geographies were overlaid on the CEDS index and break-off indices. This again identifies opportunities for new strategies to target CEDS populations (e.g., to align residential strategies with workplace strategies).

These maps are shown in Figure 12 through Figure 18 for each ESO in the following order: GCO, Aero ATL, Livable Buckhead, Perimeter Connects, Midtown Transportation, Atlantic Station Access + mobility Program (ASAP+), and Clifton Corridor TMA (CTMA).

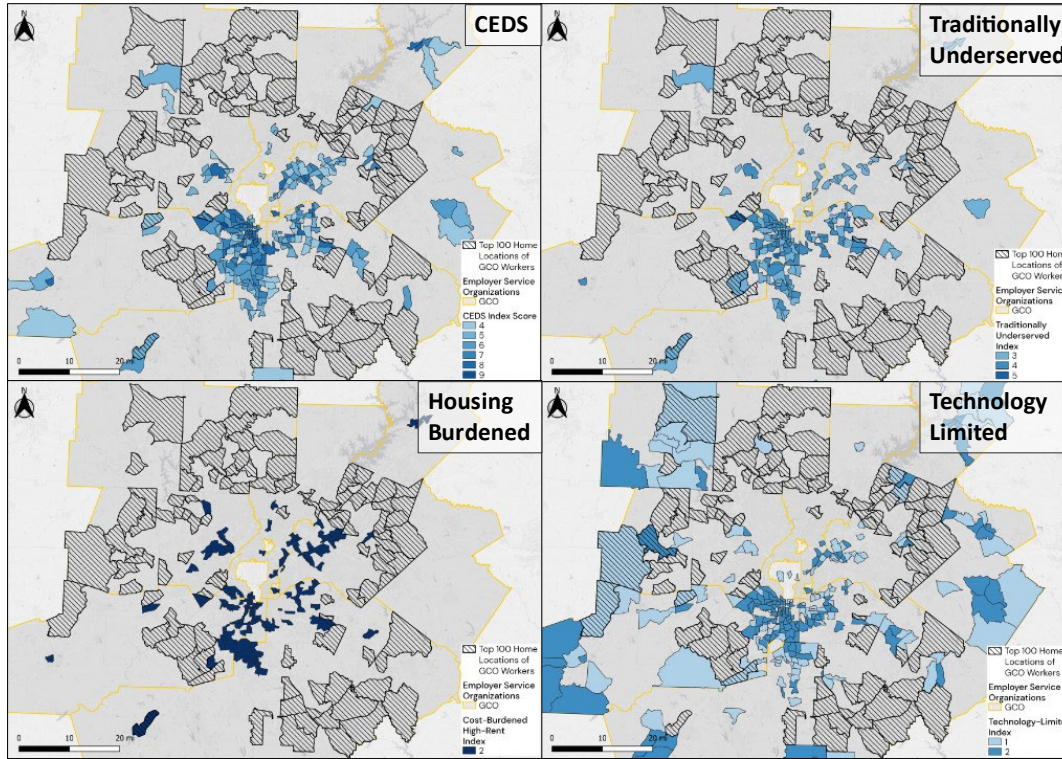


Figure 12: GCO Top 100 home locations (Census tracts where GCO workers live) overlaid on CEDS indices

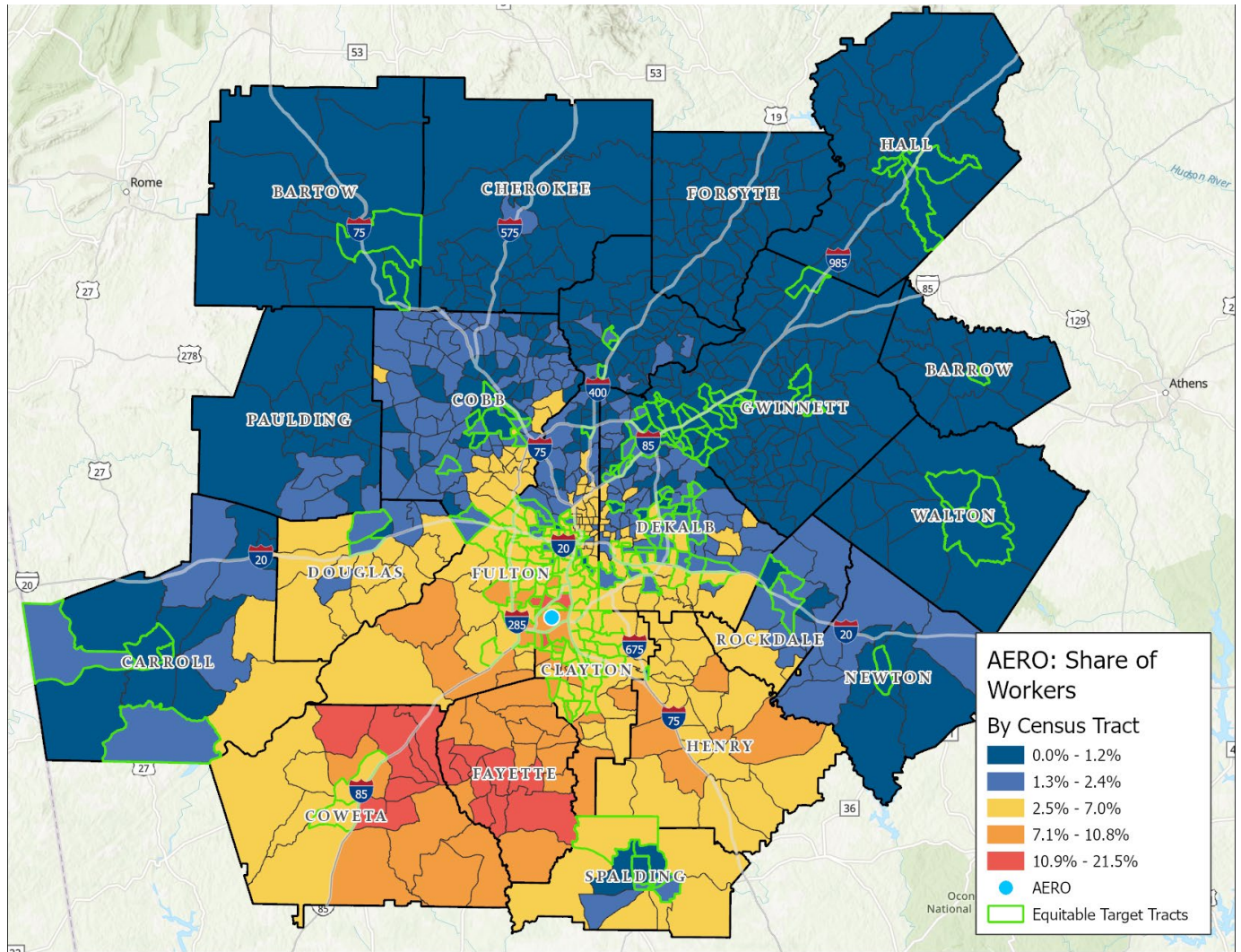


Figure 13: Relative density of AERO workers' home locations overlaid with equitable target tracts (green)

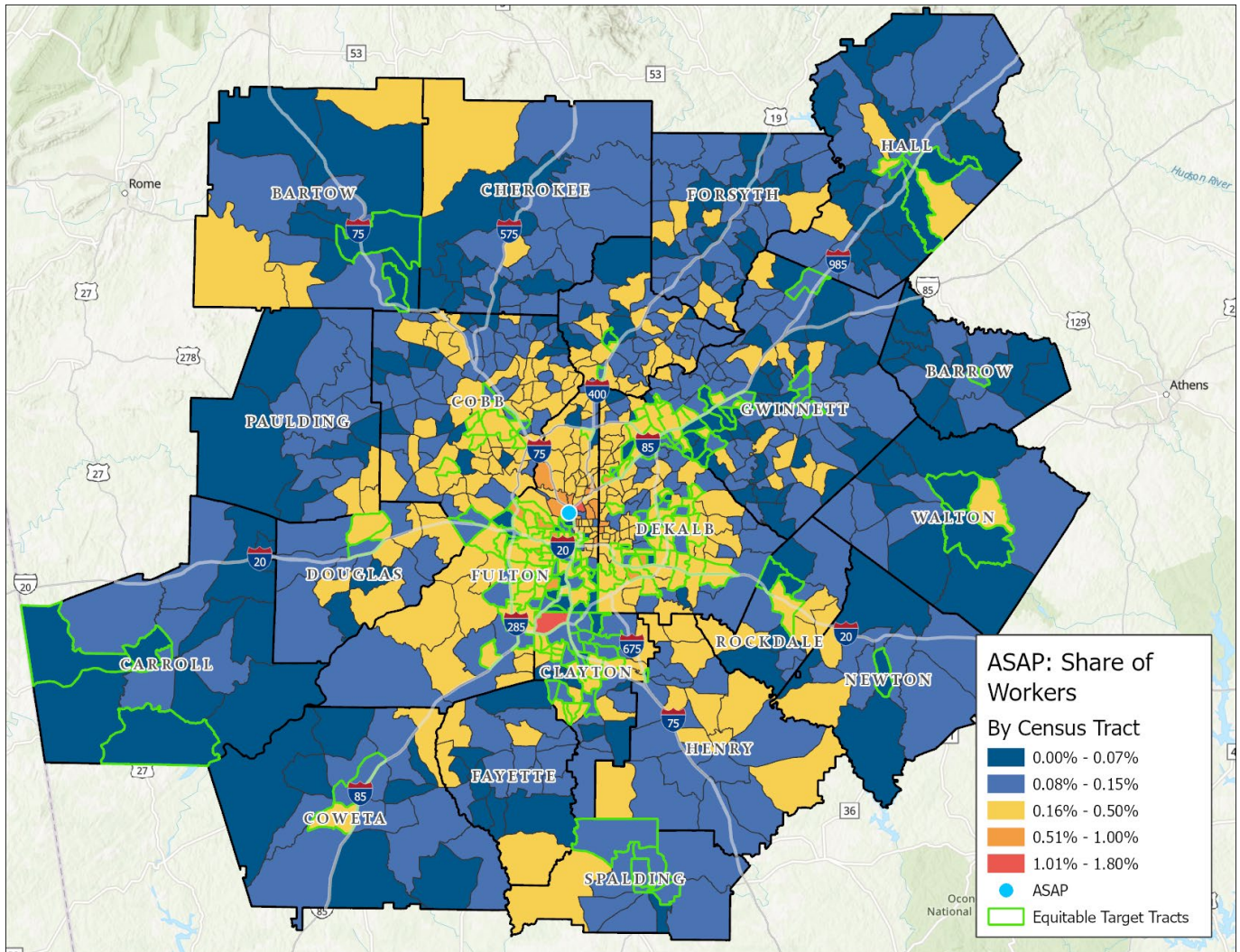


Figure 14: Relative density of AERO workers' home locations overlaid with equitable target tracts (green)

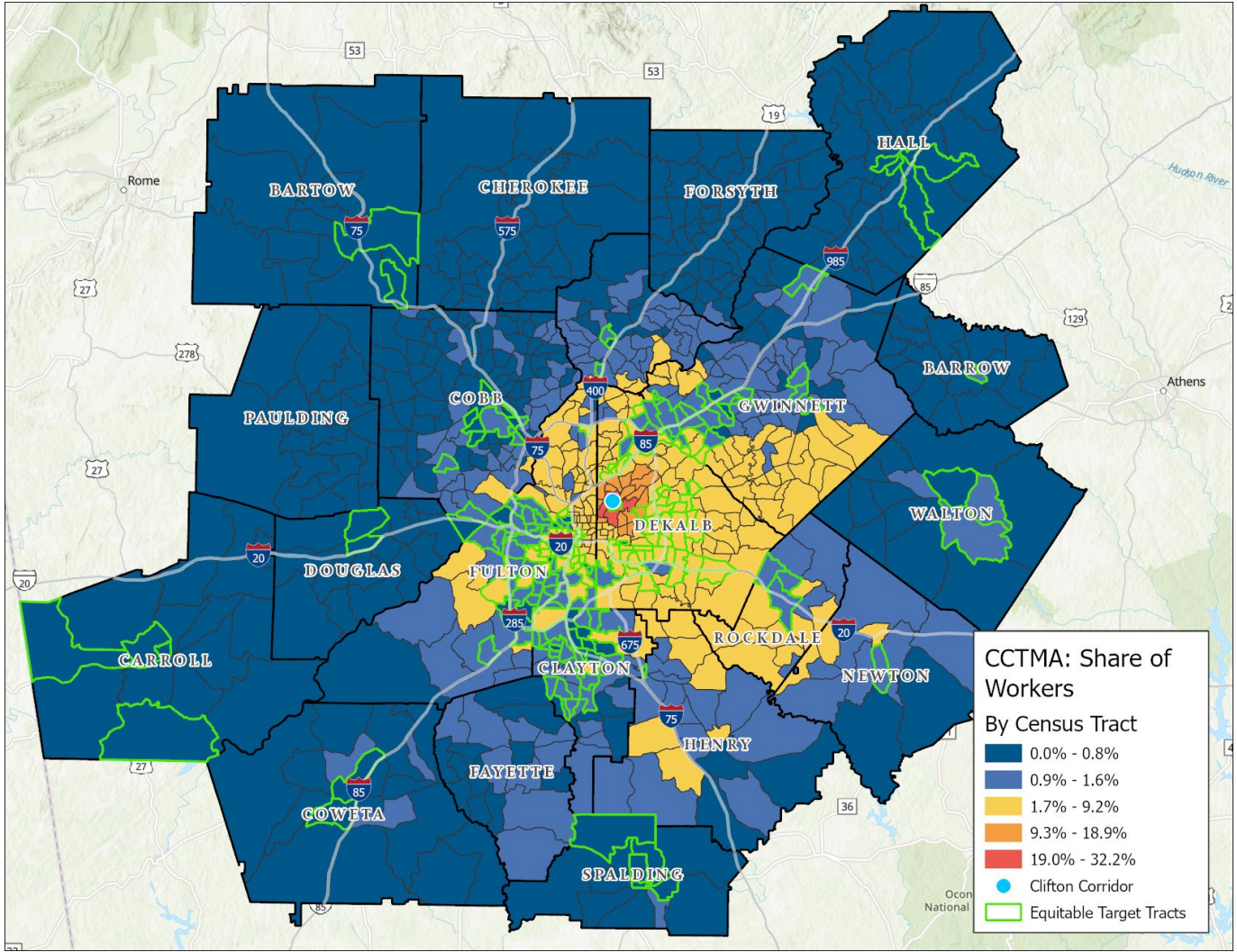


Figure 15: Relative density of Clifton Corridor Transportation Management Association (CCTMA) workers' home locations overlaid with equitable target tracts (green)

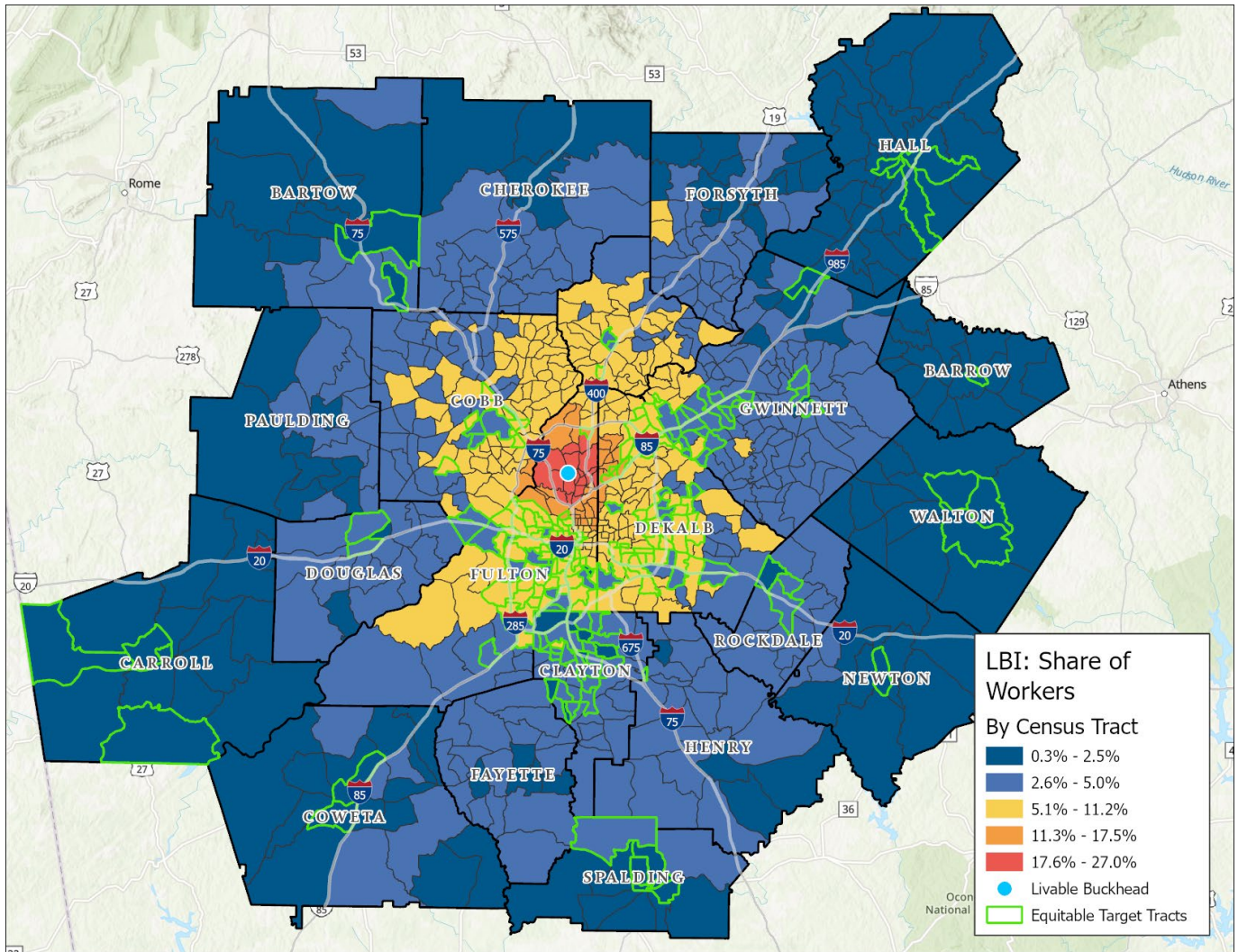


Figure 16: Relative density of Livable Buckhead Initiative (LBI) workers' home locations overlaid with equitable target tracts (green)

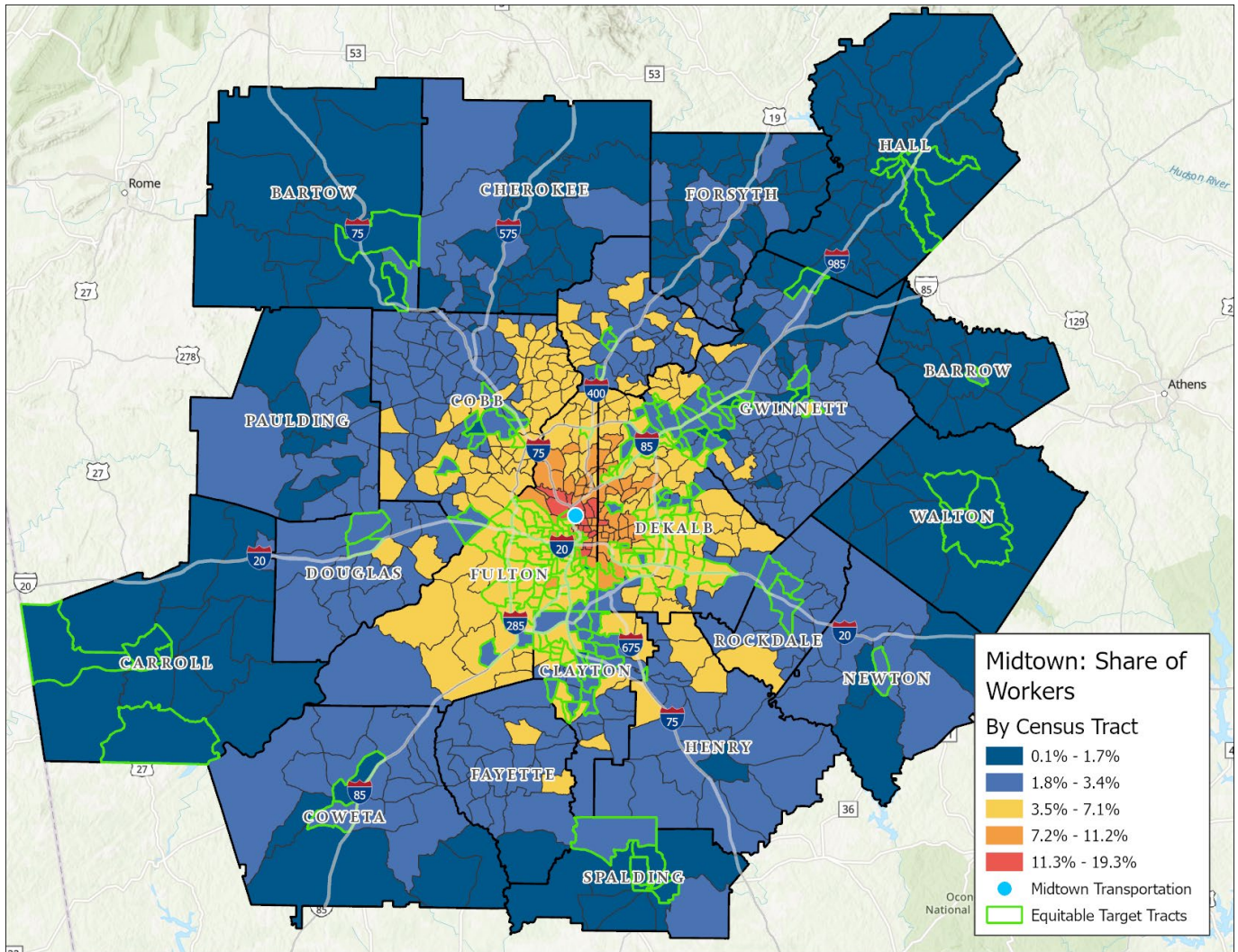


Figure 17: Relative density of Midtown Transportation (MT) workers' home locations overlaid with equitable target tracts (green)

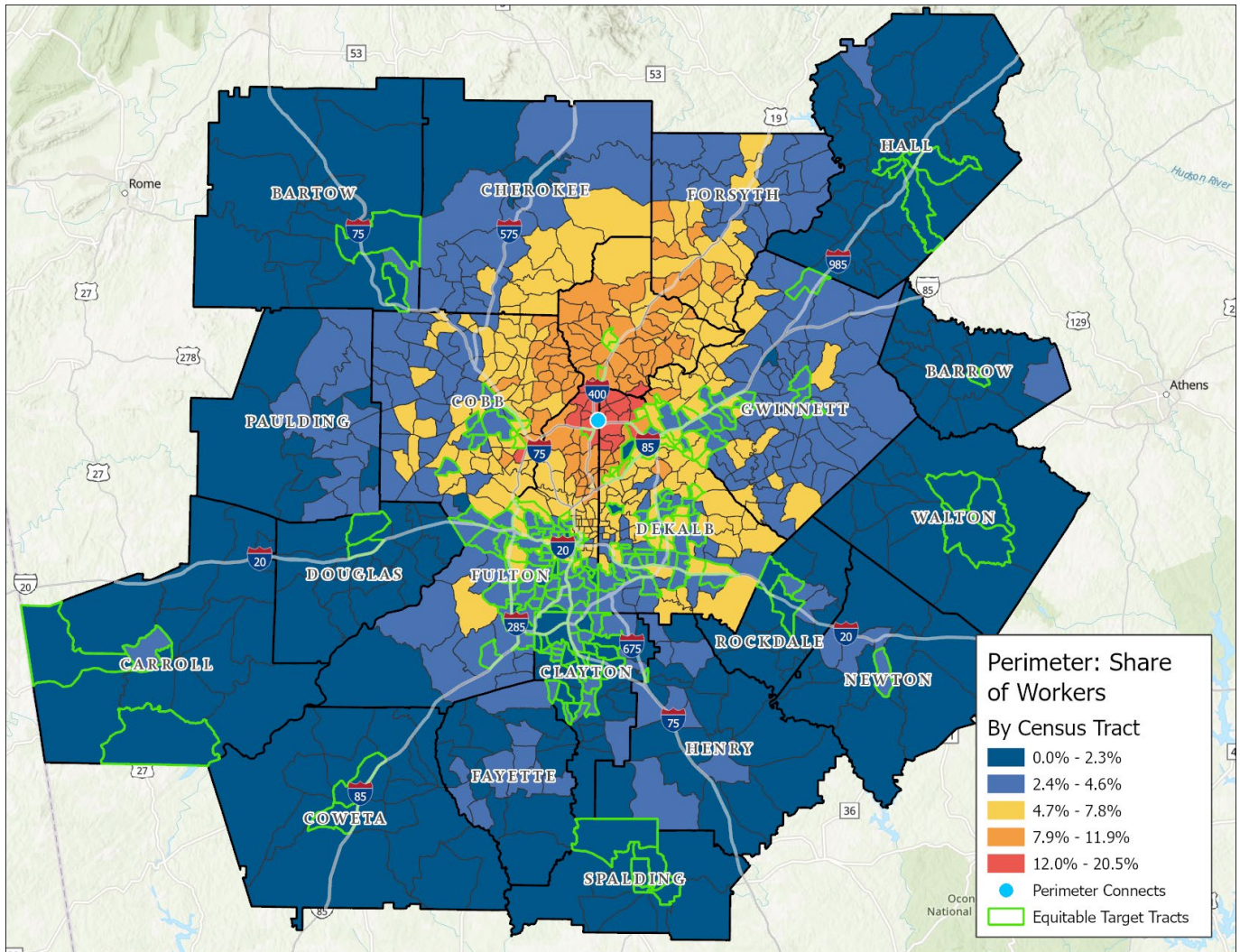


Figure 18: Relative density of Perimeter Connects (PC) workers' home locations overlaid with equitable target tracts (green)

University Outreach

Next, schools both considered and selected for the TDM program's University Transportation Pilot Program were mapped against the Traditionally Underserved index to further understand how specific strategies targeted to higher education institutions were serving CEDS communities. This is shown in Figure 19.

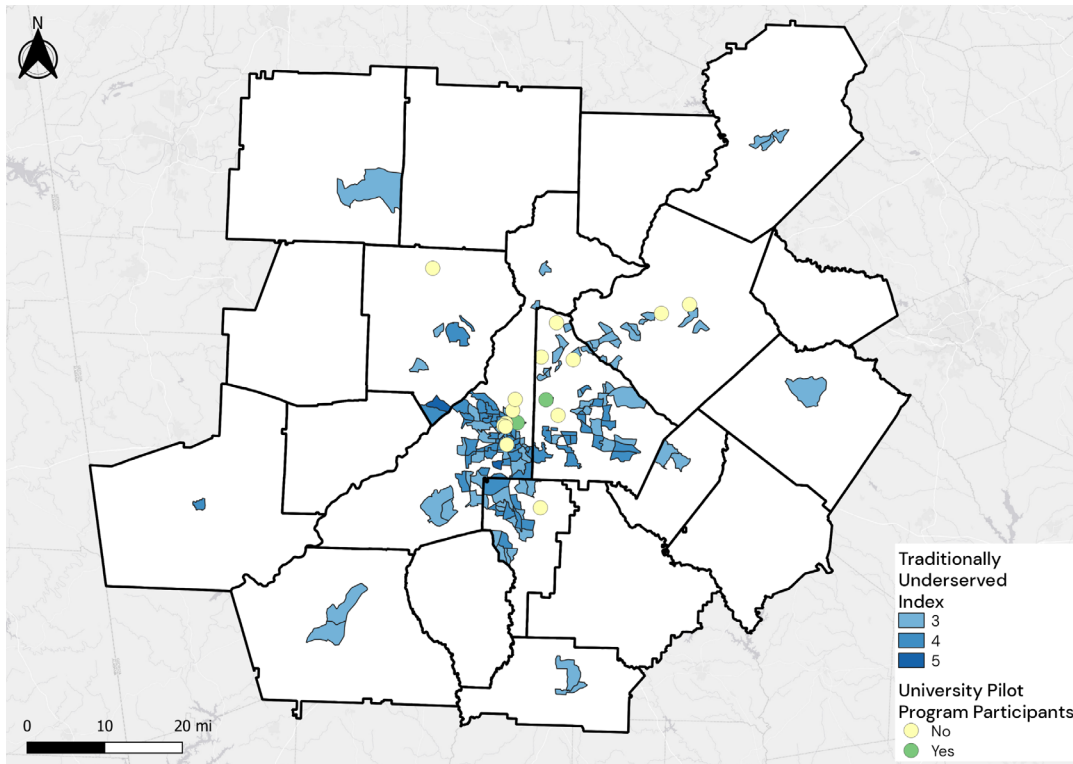


Figure 19 University Transportation Pilot Program Considered and Selected Participants and the Traditionally Underserved Index

Distribution of GCO Membership

After this, GCO member home and work locations were mapped and compared to the Traditionally Underserved index and LODES low-earning job locations, respectively. These maps are shown in Figure 20 and Figure 21. Comparisons were also drawn between GCO member work locations and mid-earning job locations, as well as between GCO member home locations and the other CEDS indices. These maps helped the team understand the broad reach of the current TDM program, and how that aligned with CEDS populations and low- and mid-income worker job locations.

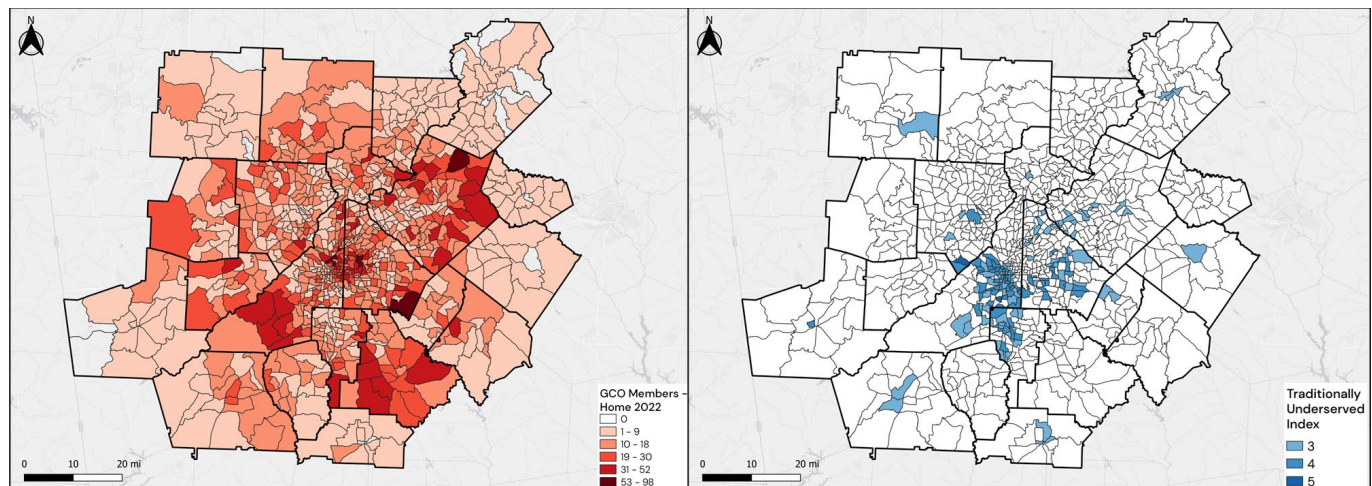


Figure 20 GCO Member Home Locations (Left) and the Traditionally Underserved Index (Right)

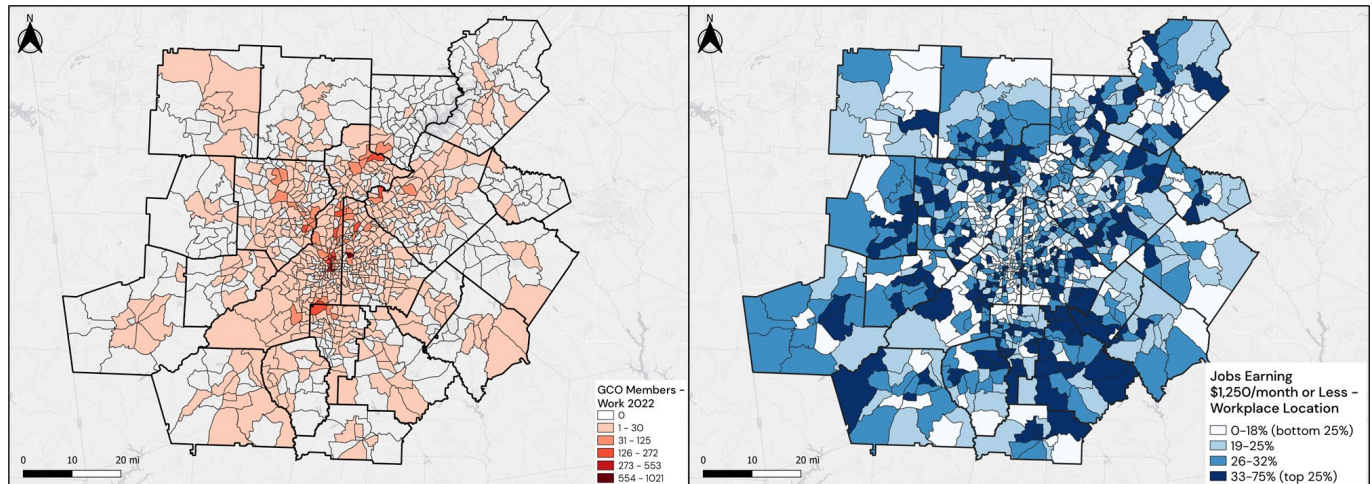


Figure 21 GCO Member Work Locations (Left) and Low-Earning Job Workplace Locations (Right)

Regional Transportation Plan (RTP) Investments

Finally, to get a broad understanding of the impacts of investment on the region, RTP transit and first-mile last-mile planned investments were mapped against Urban Displacement Project’s Displacement, Gentrification, and Exclusion neighborhood typologies for the inner Atlanta region counties (see Figure 22).

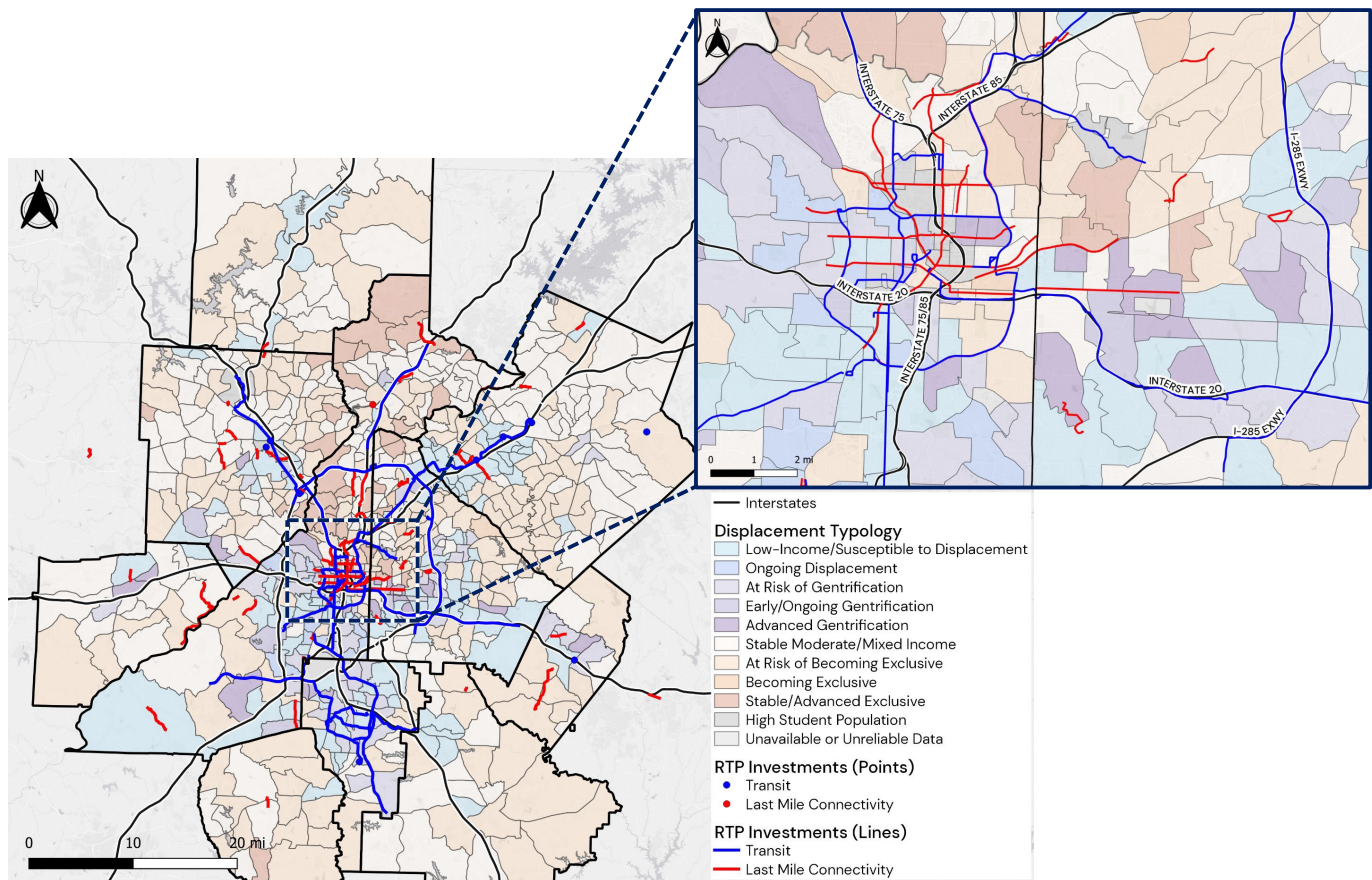


Figure 22: RTP Investments and Displacement Typologies

Step 4: Identify Overlap or Gaps between Existing Services and Transportation Needs

Step 4 is an extension of Step 3, where overlap or gaps between existing services and transportation needs were extrapolated from the mapping exercises. Key findings related to this are presented in this section with respect to each mapping activity presented under Step 3. Additionally, the TDM program’s existing strategy set is associated with the transportation pain points supported. Note that throughout this step, the number or percentage of Census tracts covered partially or fully within each ESO boundary is used as a proxy for the population served. Census tracts average about 4,000 inhabitants each, ranging from 1,200 to 8,000.

ESO Boundaries Overlaid with CEDS Indices and Breakoff Indices (see Figure 8 through Figure 11)

Table 2 shows the summary data extracted from each map overlay presented in Figure 8 through Figure 11 in the Step 3 mapping exercise – namely, it shows the percentage of Census tracts covered partially or fully¹ by each ESO/TMA that are high scoring on the various CEDS indices. It also shows the percentage low- and mid-earning jobs, as defined by LODS data, located in Census tracts covered partially or fully by each ESO/TMA. While the former presents opportunities for residential strategies, the latter indicates opportunities to continue targeting strategies toward employees within ESO/TMA boundaries.

¹ Because ESO boundaries do not align to Census tract boundaries, some tracts may be partially covered by more than one ESO. This means some tracts are counted toward the values in more than one ESO.

Table 2: ESO Coverage Summary

ESO (# total tracts located partially or fully in the ESO)	Residential Focus				Employment Focus	
	% High-Scoring (>=4) Equitable Target Tracts	% High-Scoring (>=3) Traditionally Underserved Tracts	% High-Scoring (=2) Cost-Burdened High-Renter Occupancy Tracts	% High-Scoring (>=1) Technology-Limited Tracts	% Low-Earning Jobs in Covered Tracts	% Mid-Earning Jobs in Covered Tracts
GCO (931)	25%	17%	15%	26%	21%	30%
Aero ATL (4)	100%	50%	75%	50%	15%	23%
Livable Buckhead (30)	0%	0%	0%	10%	17%	26%
Perimeter Connects (10)	10%	0%	10%	0%	13%	20%
Midtown Transportation (19)	16%	11%	16%	16%	17%	22%
ASAP+ (3)	33%	0%	33%	0%	19%	33%
Clifton Corridor TMA (10)	10%	10%	10%	10%	18%	25%
Regional Average	24%	17%	14%	26%	21%	30%

In terms of the standard CEDS index, GCO has a major opportunity to target CEDS tracts; while only 25% of tracts located partially or fully within GCO boundaries have a score of 4 or more on the CEDS index. Because GCO encompasses the majority of tracts in the region, the potential reachable population is large. There appear to be opportunities to reach high-scoring CEDS tracts in several counties, including Carroll, Spalding, Rockdale, Walton, Gwinnett, DeKalb, Fulton, Clayton, Cobb, and Hall. Aero ATL and ASAP+ also have significant targeting potential, albeit to a smaller number of tracts.

GCO, Aero ATL, Midtown Transportation, and Clifton Corridor TMA all have opportunities to target residential strategies toward traditionally underserved populations focused in Fulton and DeKalb counties. GCO has additional opportunities in Gwinnett, Clayton, Bartow, Hall, Cobb, Walton, Coweta, Carroll, and Rockdale, and Spalding counties. The produced maps can help inform which locations within each county and ESO boundary could be targeted to provide new services, to survey regarding transportation needs, and to market TDM services while improving equitable service distribution of the TDM program.

Regarding cost-burdened, high-renter occupancy areas, there are opportunities in Cobb, Clayton, Fulton, Gwinnett, and Dekalb counties. Outside the core area of the region, there may also be strategies targeted out to Hall, Carroll, Coweta, Douglas, Spalding, and Rockdale counties. GCO encompasses the greatest number of tracts that could potentially be targeted here, simply given its coverage of most of the region. Aero ATL, ASAP+, and Midtown Transportation may also consider administering strategies targeting these populations within their TMA boundaries.

Finally, the technology-limited index informs how marketing for residential strategies might be done. Namely, ESOs with higher percentages of high-scoring tracts here may consider both digital and other forms of marketing media, e.g.,

newspaper campaigns, mailers, phone campaigns, etc. Additionally, if any surveying is done to better understand residential needs, surveys could be administered in multiple formats (e.g., paper, phone, online).

With respect to low- and mid-earning workers, all the ESOs have opportunities to target these workforce segments. Low-income workers can benefit from services that may be able to help them reduce their transportation costs; programming for mid-earning jobs may help retention, advancement, and expansion of opportunities at this level, which have been stagnating or declining in the region in recent years.

OnTheMap Overlays to Visualize Where Workers Working in Each ESO Live

Data presented from the series of maps in Figure 12 through Figure 18 is summarized in Table 3 – namely, the table shows, for each ESO/TMA, the percentage of home locations of workers that are in equitable target areas.

Table 3: Share of Workers Living in Equitable Target Areas

Work Territory	Equitable Target Tracts	Traditionally Underserved Tracts	Cost-Burdened High-Renter Tracts	Technology-Limited Tracts
Region	16.9%	11.3%	9.7%	19.3%
AERO	18.9%	14.0%	10.0%	21.1%
ASAP	21.6%	15.0%	13.3%	21.4%
Clifton Corridor TMA	17.0%	12.4%	10.5%	18.8%
Livable Buckhead	16.7%	11.2%	10.4%	16.4%
Midtown Transportation	18.0%	12.8%	10.7%	19.2%
Perimeter Connects	14.1%	9.1%	9.3%	13.2%

Some common, high-level takeaways can be derived from Figure 12 through Figure 18 and Table 3:

- Within each ESO/TMA, strategies that support commutes from the ESO/TMA to the high-scoring CEDS home location tracts – particularly to those high-scoring on the traditionally underserved and cost-burdened high-renter occupancy index – may help improve equitable service delivery and provide transportation services to those populations with the greatest need.
- There may be opportunities for ESO/TMA collaboration to target residential strategies toward high-scoring cost-burdened high-renter occupancy tracts if workers living in these areas commute to a different ESO/TMA for work.
- Any marketing strategies toward commuters living in high-scoring technology-limited tracts should include a mix of digital and physical mediums to increase reach toward technology-limited populations. Strategies should also not solely rely on a technological solution (e.g., a mobile phone app or website to book a service) and have alternative access options (e.g., being able to call to book service or find out about commute options).
- Overall, expanding residential-targeted strategies may help ESOs/TMAs more effectively target populations who face housing cost burden and who have been traditionally underserved, or who are overall economically disadvantaged – presenting a major opportunity for the TDM program.

University Outreach

Based on the map presented in Figure 19, both universities (Georgia State University and Emory University) selected for the University Transportation Pilot Program are in tracts with a CEDS Traditionally Underserved Index score of three or higher. On the Traditionally Underserved index, both the Census tracts for Emory University and Georgia State University had a score of three, scoring one each on the high unemployment, poverty rate, and cost burden indicators. Both tracts also had a score of two on the cost-burdened, high-renter occupancy index.

In thinking about expanding the pilot, six of the remaining 14 considered sites are also in tracts with a CEDS Traditionally Underserved Index Score of three or higher: Atlanta Technical College, Clark Atlanta University, Georgia Institute of Technology, Mercer University - Atlanta, Morehouse College, and Spelman College.

Distribution of GCO Membership

The mapping analysis of GCO members was combined with statistical testing to better understand the significance of differences in how members were distributed across tracts by CEDS scores and jobs earnings levels. On the residential end, high-scoring tracts on the Traditionally Underserved index (≥ 3) have 10 GCO members, compared to 14 in other tracts on average. These average differences hold for high-scoring tracts on the Cost-Burdened High-Rent ($=2$) and Technology-Limited (≥ 1) indices². Thus, underserved tracts as defined by all indices have fewer GCO members as residents compared to other Census tracts. This difference is statistically significant, i.e., it cannot be attributed to random chance.

On the employment end, tracts with low-earning worker populations in the top 25% (~33% of workers or more) have two GCO members, compared to 15 in other tracts. This difference also holds for tracts with mid-earning worker populations in the top 25% (~39% of workers or more)³. Thus, underserved tracts as defined by all indices have fewer GCO members working in them compared to other Census tracts. This difference is statistically significant, i.e., it cannot be attributed to random chance.

There are significantly fewer GCO members (on average) in tracts belonging to each indicator compared to the rest of the region:

- Traditionally underserved
- Cost-burdened
- Technology-limited
- Low-earning workers (top 25% of tracts)
- Mid-earning workers (top 25% tracts)

Traditionally Underserved, Cost-Burdened High-Rent, Technology-Limited Tracts have **10** GCO members on average to **14** in other tracts.

On average, tracts with low and mid-earning worker populations in the top 25% have **2** GCO members, compared to **15** in other tracts.

RTP Investments

The map of RTP investments compared to neighborhood typologies in Figure 22 shows that transit and last-mile connectivity investments are concentrated in the core, in areas that are subject to gentrification, displacement, or are already exclusive. Additionally, comparing the investments back to Figure 5, the planned investments do not extend transit or last-mile connectivity beyond the core areas where transit is already most prevalent in the region. Offering services that connect commuters and travelers in the outer countries of the region to the core transit system could help more workers and residents use transit as a viable mode.

² Welch's t-tests showed these differences are significant for the Traditionally Underserved ($t(367) = 5.19, p < 0.001$), Cost-Burdened High-Rent ($t(224) = 4.5, p < 0.001$), and Technology-Limited ($t(524) = 6.0, p < 0.001$) Index comparisons. Welch's t-test was used given unequal variances.

³ Welch's t-tests showed these differences are significant for low- ($t(747) = 5.1, p < 0.001$) and mid-earning ($t(814) = 4.7, p < 0.001$) job comparisons.

Equity Implications of Existing Strategy Types

Keeping the above gaps and opportunities in mind, equity implications of existing strategy types were considered and are summarized below.

- **Tools** are technology-centric and are thus limited in terms of their reach (for both worker populations not allowed to use cell phones (which came up in our discussion on shift work) and residential populations without computer access or who are otherwise technology limited). It is sometimes difficult to share apps with certain types of employees (e.g., manufacturing, or utility field workers) due to the nature of their work and schedules, and lack of desk centric work. Another equity concern is that an individual's level of engagement with the app will always be tied to how technologically savvy they are and their level of access to the internet (website or mobile).
- **Incentives** are promoted through ESOs, employer and property manager partners, general community engagement, and digital media efforts, e.g., the GCO app, website, social media) where again, access to the internet or technology presents issues for certain populations.
- **Employer Services** are typically provided in partnership with employer AND property manager partners (as employers), and have traditionally focused on 9-5, white-collar commuters who drive alone in order to reduce vehicle miles travelled, congestion, and emissions.
- **Modal promotions'** outreach occurs with employer partners, property manager partners, local governments, community partners (e.g., EPA, Boys & Girls Club), K-12 partners and through digital media. TMA/ESO partners have a big role to play in regional promotions.
- **Marketing and communications'** outreach occurs with employer partners, property manager partners, local governments, community partners (e.g., EPA, Boys & Girls Club), K-12 partners and through digital media. Outreach is also pushed out through public relations and media engagement (e.g., media placements, press releases, etc.).
- **University outreach** pilots are ongoing at Georgia State University and Emory University; equity considerations were taken into account when selecting pilot sites.
- **School outreach** is provided in partnership with K-12 partners which are schools, districts and community partners (e.g. Safe Routes to Schools, EPA, etc.). The current strategy includes focuses on targeting the most critical school systems based on need and opportunity. Deciding how need and opportunity are defined is a critical step.
- **Residential outreach** has seen a two-phase approach for GCO. Phase 1 was equity-based pilot work with property manager partners and direct outreach to single family residences in selected underserved areas. Phase 2 piloted use of the Nextdoor App within those initial communities. The current strategy has moved beyond a "pilot" approach and is focusing on working with community partners for business-to-consumer (B2C) communication opportunities and residential property managers for TDM interventions and evaluation. Carpooling will be the main focus versus multi-modal messaging.
- **Commuter outreach** is promoted through employer and property manager partners, but also through direct interactions with commuters through community engagement activities.
- **Industry outreach** by GCO is currently focusing on the industrial sector (manufacturing, freight, warehouse, distribution) and will expand to other key sectors based on regional employment data.
- **Planning/technical support to enhance existing TDM services** based on existing data collection, research and evaluation is a key strategy for the sustainability of the program. From an equity standpoint, there may be considerations in how different populations are reached. GCO app participants are a typical audience for evaluation, and research is also done through the support of employer and property manager partners. However, there are likely opportunities to expand reach into different population groups with different groups of community partnerships (e.g., LAA or WorkSource).

- Regional leadership** includes collaboration with regional transit operators, rideshare/TNCs, vanpool providers (e.g., Enterprise), Georgia Tech, and other strategic partners to increase awareness of commute options, but also improve access throughout the region. This also includes innovation projects, which is a key focus area for GCO and the TMAAs and has sometimes taken equity approaches. In the existing strategy set, Residential Outreach and University Outreach pilots were considered "innovation" projects.

Table 4 summaries which of the existing strategy types address the identified transportation pain points over the course of the equity analysis.

Table 4 Existing Strategies and Transportation Pain Points

Existing Strategy Sets	Transportation Pain Points						
	Zero-car households	Cost burdened	No transit at work or home	No first/last mile option(s)	Off-peak commuting	Language barriers (inaccessible information)	Technology limited (inaccessible information)
Tools	•	•	•	•	•		
Incentives	•		•	•			
Employer Services			•	•			
Modal Promotions	•		•	•			
Marketing & Communications	•	•	•	•		•	
University Outreach		•					
School Outreach							
Residential Outreach		•					•
Commuter Outreach							•
Industry Outreach					•	•	•
Strategic Planning and Technical Support							
Regional Leadership			•	•			

Examining Table 4, only two of the 12 strategies support pain points related to off-peak commuting and language barriers, while three support the technology-limited pain point. As such, new strategies that help address these pain points will benefit the region. Still, four of the 12 strategies support pain points related to not owning a car and being cost burdened, while half

of the 12 support a lack of transit or first/last mile connectivity options. While these pain points are more greatly supported compared to the others, new strategies should continue to address them in order to build out robust support networks, especially given the regional equity context established in Step 2 relative to zero-car households, transit coverage, and off-peak commuting. Note that although school outreach is not identified as addressing pain points explicitly, defining how need and opportunity are defined in targeting schools and what services are offered in turn would help map that strategy better to the pain points it would address.

Step 5: Cross-Check New Strategies Against Gaps in Coverage

With the culmination of the analysis activities in mind, the equity implications of the new strategy types were compiled, and the new strategies were assessed for their support of the transportation pain points identified. Equity implications for the newly proposed strategies are listed below:

- Community Partner Engagement:** This strategy type encompasses outreach, marketing, incentives, and program support to implement and expand TDM services across a broad network of community partners. Community partnerships can be modeled on existing employer outreach and employer services but tailored to established community-based organizations (CBOs), particularly those that serve disadvantaged communities. TDM services and strategies may support commute or non-commute mobility needs. This strategy can help build a more localized network to support tailored services and service delivery that addresses a broader range of socio-economic mobility needs.
- Land-use and development:** This strategy type advances and formalizes integration of TDM within local land planning and development review process. There is potential to target policies and tools based on needs-based indicators.
- Planning and programming:** This strategy type supports direct integration of TDM policy into regional and local planning and programming processes. There is potential to target policies and tools based on needs-based indicators.

Table 5 summarizes how new strategy types would address the suite of identified transportation pain points.

Table 5 New Strategy Types and Pain Points

New Strategy Sets	Transportation Pain Points						
	Zero-car households	Cost-burdened	No transit at work or home	No first/last mile option(s)	Off-peak commuting	Language barriers (inaccessible information)	Technology limited (inaccessible information)
Community partner engagement	•	•	•	•	•	•	•
Land use and development	•	•	•	•			
Planning and programming	•	•	•	•	•		

The new proposed strategy set helps fill out some of the biggest gaps in pain point associated with the existing strategy set – two of the three proposed strategies can support off-peak commuting, while community partner engagement can help address pain points associated with language barriers and lack of access to technology. Further, all of the proposed strategies can address pain points associated with not owning a car, cost-burden, and lack of transit or first/last mile access – making the program more robust in its approach to addressing these issues.

Personas

Based on the transportation pain points and alignment with existing and new strategy types, persona profiles were developed that illustrate how these equity considerations translate to the daily lived experience of residents in the region. Each persona represents a hypothetical Atlanta region resident embodying diverse characteristics who may be impacted by the TDM service. Each persona profiles provides a brief summary of the person’s transportation characteristics, pain points, and impacts of the service/strategy.



Resident Impacted by Residential Outreach

I'm currently unemployed. Finances have been tight, so I've had to move further out from the central region to save on rent. I don't have a car, and don't have transit access at my new apartment, which has made completing daily tasks like getting groceries, going to the doctor, or checking in on my grandmother, more difficult. I recently got a flyer in the mail from my new apartment building about regional mobility service offerings that I didn't know existed before. Other people in my building and I have formed carpools for daily travel, which allows me to get around more easily and for less money – we just split gas costs. I'm even able to join carpools to get to my grandma's house when it's on the way for other drivers. Through a new

program in my area, I can even log my carpool trips to be entered into raffles for monetary prizes. I'm way less stressed out about getting around now.



Commuter Impacted by Industry Outreach

I don't have a car. While there is a bus stop at my workplace in Gwinnett County, I can't access the network from home in Hall County. Walking or biking isn't an option because my commute is too long. I usually have to rely on friends to take me to work, especially because my shifts don't line up with the transit schedules. Since my employer started promoting carpool and vanpool services that extend to Gwinnett County, I am reliably commuting in a vanpool with my coworkers. I'm calling out of work less, since transportation for my shifts is much easier than before. The vanpool is also much more affordable than taking a taxi, Uber, or Lyft!



Teleworker Impacted by Flexible Commute Incentives

I recently got a new job. I now telework most of time, and only go into the office in Downtown Atlanta 1-2 times a week. At my last job, I purchased a discounted monthly MARTA commuter pass from my previous employer. My new employer offers the passes, too, but the monthly cost doesn't make as much sense with my teleworking -- especially as I'm trying to rebuild my savings after finishing school. Then, I heard that the employer pass program is now going to be offered in a daily version -- I can get a commuter pass that will automatically give me a discount on my two-way transit trip up to two days a week. Compared to driving, this makes much more sense for me financially right now, and will help me continue to use transit during my commutes. My spouse is going to talk to their employer about signing up for the program, too!



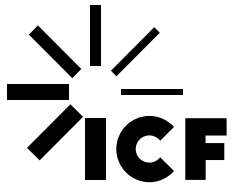
Spanish-Speaking Older Adult Impacted by Tailored Marketing Materials

I live in an apartment building for seniors in DeKalb County. It's close to shopping and my doctor, but the bus doesn't come frequently and it's hard for me to walk on my own. For a long time, I relied on my brother and sometimes my niece to drive me around. I didn't realize that there are free and low-cost transportation services I could use like a volunteer driver program and a shuttle from the senior center. A few weeks ago, I saw a flyer posted in the lobby of my building that was in Spanish, so I could understand it easily. It explained the transportation services and gave me a number to call to sign up. I've used the services a few times now, and I love the freedom they give me to get where I need to go.

Key Takeaways

In summary, the following key takeaways can be derived from this equity analysis:

- Mobility resources for workers in low- and mid-earning jobs, including additional access to transit services, would be beneficial in supporting economic growth and diversity in the region.
- Transit service is concentrated centrally in the region, while low- and mid-earning job locations are dispersed throughout. Mobility services that help connect workers and travelers to the central transit system would be beneficial for the region.
- Not owning a car, cost-burdens, lack of access to transit and connections, commuting off-peak, language barriers, and lack of access to technology form major transportation pain points in the region.
- Traditionally underserved populations are located throughout the region, and ESOs and TMAs have opportunities to deploy both residential and employment-focused strategies to better serve these areas and increase the reach of the TDM program. By looking at the CEDS populations, we can better target strategies that connect traditionally underserved residents to jobs and other resources. Specifically, while ESOs typically target outreach to employees within their boundaries, there is an opportunity for residential-targeted strategies; either:
 - CEDs populations livings within ESOs
 - CEDs populations outside of ESO boundary that could align to ESO employment needs
- A diverse plan for marketing and engagement that goes beyond the digital realm is needed, especially for populations living in areas with limited access to technology.
- The newly proposed strategies help fill gaps in the existing strategy set by addressing less-supported pain points such as off-peak commuting, language barriers, and limited technology access. These strategies also provide additional support for other pain points.



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