

6 Market Profile

The foundation of understanding how to best serve an area with transit is to understand the underlying market and demand for different kinds and levels of service.

This market profile examines:

- The underlying demand for transit services throughout the study area
- Where people are traveling from and where they're going
- Whether those factors would support high-capacity transit in the study area

Introduction

Underlying transit demand is strongly related to the following factors, discussed in detail in this chapter:

Population and Population Density: Since transit relies on having people in close proximity to service, higher population density makes it feasible to provide higher levels of service.

Socioeconomic Characteristics: Different people have a different likelihood to use transit, with differences related to socioeconomic characteristics. For example, households with many cars are much less likely to use transit than those with one or none.

Job Types and Employment Density: The density of jobs is also a strong indicator of transit demand, as traveling to and from work often accounts for the most frequent type of transit trip. The type of job influences who travels there and whether it is just employees or also customers, clients, patients, and students.

Travel Flows: People use transit to get from one place to another. High-capacity transit lines are designed to serve corridors with high volume travel flows.

More than any other factor, **population and employment density** will determine the underlying demand for transit. This is because:

- The reach of transit is generally limited to between one-quarter and one-half mile of the bus stop or station. As a result, the size of the travel market is directly related to the density of development in that area.
- Transit service frequencies, in turn, are closely related to market size. Bigger markets support more frequent service, while smaller markets can support only less frequent service.
- To attract travelers who have other options, such as private automobiles, transit service must be relatively frequent and get riders to their destination in a time and at a cost competitive with a private vehicle.

Population and job densities also provide an indication of the underlying population-based demand for transit in terms of the type and frequency of service that would be most appropriate. However, these densities broadly indicate demand across contiguous and nearby areas. Clusters of density throughout an area or along







LAND USE			TRANSIT	
Land Use Type	Residents per Acre	Jobs per Acre	Appropriate Types of Transit	Frequency of Service
 Downtowns & High Density Corridors	>45	>25	Light Rail, BRT, Rapid Bus, Local Bus	10 mins or better
 Urban Mixed-Use	30-45	15-25	BRT, Rapid Bus, Local Bus	10-15 minutes
 Neighborhood & Suburban Mixed-Use	15-30	10-15	Local Bus	15-30 minutes
 Mixed Neighborhoods	10-15	5-10	Local Bus, Micro-transit	30-60 minutes
 Low Density	2-10	2-5	Micro-transit, Rideshare, Volunteer Driver Pgm	60 mins or less or On Demand
 Rural	<2	<2	Rideshare, Volunteer Driver Pgm	On Demand

Figure 6-1 Relationship between Land Use and Transit Types and Frequencies

a corridor are strong indicators of demand, while a dense but small block group in an isolated area would not produce sufficient demand by itself. Demand can also accumulate along corridors to produce demand for more frequent service than the densities alone would indicate. For example, long corridors where most block groups have the density to support 15- to 30-minute service will often produce accumulated demand for 15-minute or better service.

Areas that do not have at least 10 residents or 5 jobs per acre or a combination thereof, generally more sprawling communities made up of single-family homes, do not provide an environment where fixed-route transit can succeed easily, and are not appropriate for high-capacity transit.

Why is transit important?

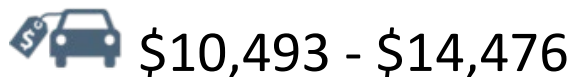
Transit has the promise of being a safe, affordable, and convenient travel option for people of all ages and abilities. Transit is the most affordable mode for travel in the

study area. A monthly pass for unlimited RIPTA rides costs \$70 for adults. An MBTA Monthly Commuter Rail pass costs \$110, which would cover all MBTA-based Commuter Rail travel, including between Providence and Wickford. The Reduced Fare Bus Pass Program allows qualifying low-income seniors (age 65 and over) and low-income persons with disabilities to travel for free for two years. Students at many of the colleges throughout the region, including CCRI, can ride for free or purchase reduced fare passes, depending on the school. RIPTA costs riders less than \$1,000 a year.

By contrast, **automobile ownership and gas cost residents of the municipalities that surround Providence between \$10,493 and \$14,476 per year.**¹² Given that residents in the region spend an average of 20 percent of their income on transportation, well-functioning public transit can remove a significant cost burden for many people.



A year of unlimited transit passes costs a regular rider on RIPTA less than \$1,000 a year.



For the typical resident in Providence, Warwick, Central Falls, Pawtucket, Cranston, or Cumberland, the annual cost of automobile ownership (including fueling, insurance, and maintenance) is more than \$10,000 per year and can be over \$14,000 depending on the area.¹³

When a region invests in quality transit, it can allow for greater upward economic mobility for its residents, as lessening the burden of transportation costs can allow for a resident's resources to be spent on other needs, such as education, health care, savings, and the purchases of goods and investments. Additionally,

transit is the most efficient method of transporting people in environments where street space is limited. Cars use more space than buses to move people, and the combined effect of thousands of cars on the road with only one or two people inside can result in significant congestion during peak travel periods. Transit vehicles such as buses can carry many more people down a street while using a fraction of the space that would be required to move those same people in cars.

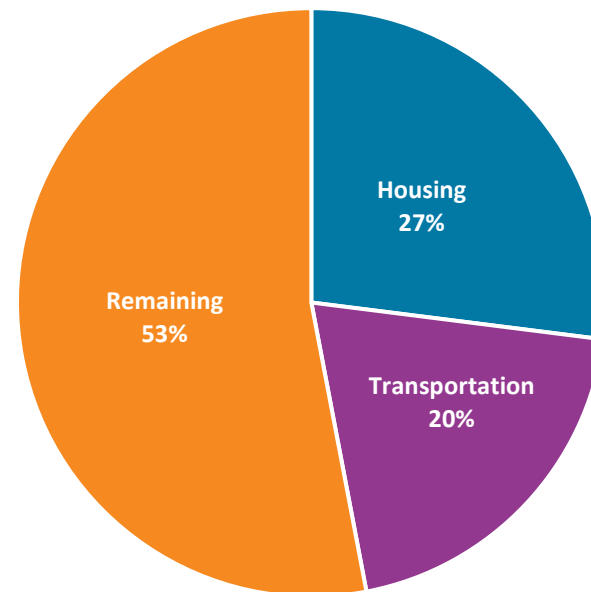


Figure 6-2 Average Housing and Transportation Costs – Providence Metro Area

The benefits of transit extend beyond alleviating congestion – **transit is both safer and more environmentally-friendly compared to traveling in a private car.** According to the CDC, communities with higher transit use experience fewer traffic related deaths per capita, and transit use reduces per-capita greenhouse gas emissions and pollution¹⁴.

¹² Center for Neighborhood Technology Housing & Transportation Index, <https://htaindex.cnt.org/>

¹³ Center for Neighborhood Technology Housing & Transportation Index, <https://htaindex.cnt.org/>

¹⁴ "Transportation Recommendations," CDC. <https://www.cdc.gov/transportation/expand-public-transportation.html>

Population and Population Density

Population density is an important factor in where transit will be successful. High population density indicates land use types that are more suitable for frequent transit service and where transit is likely to have higher ridership. Densely populated areas tend to be more walkable and less auto-oriented, with more limited access to parking and less incentive to own a vehicle. There is a total of 279,729 people in the study area. Areas within the study area with high to very high population density (at least 30 residents per acre) include the southern portion of Central Falls, Downtown Providence, Federal Hill and South Providence. These areas with the most population density would be most supportive of high-capacity transit. Some of the densest parts of the region are in the study area, which is why the potential corridors were identified for high-capacity transit.

Table 6-1 Population by Municipality

Area	Population in Study Area	Total Population
Cumberland	9,898	36,276
Central Falls	22,382	22,382
Pawtucket	41,816	75,176
Providence	111,356	189,715
Cranston	54,852	82,691
Warwick	30,719	82,783
Total	279,729¹⁵	489,023

- **Cumberland:** Population density throughout Cumberland is low, with the highest density of 10-15 residents per acre in Valley Falls.
- **Central Falls:** Central Falls has significant population density; it is also in the top 25 densest communities nationally according to the 2020 Census.
- **Pawtucket:** Pawtucket has moderate population density overall, with the highest population density surrounding Route 1 and just east of the Seekonk River, as well as surrounding the Pawtucket/Central Falls commuter rail station.
- **Providence:** There is high population density in multiple areas of Providence, including West End, Elmwood, and Lower South Providence.
- **Cranston:** The only area of Cranston with somewhat high population density is its northern border near Park Avenue. Most of the city is low density.
- **Warwick:** Warwick has low population density compared to the rest of the study area.

¹⁵ The population in the study area does not equal the municipal totals in the study area because study area does include very small parts of Lincoln, West Warwick, and North Providence

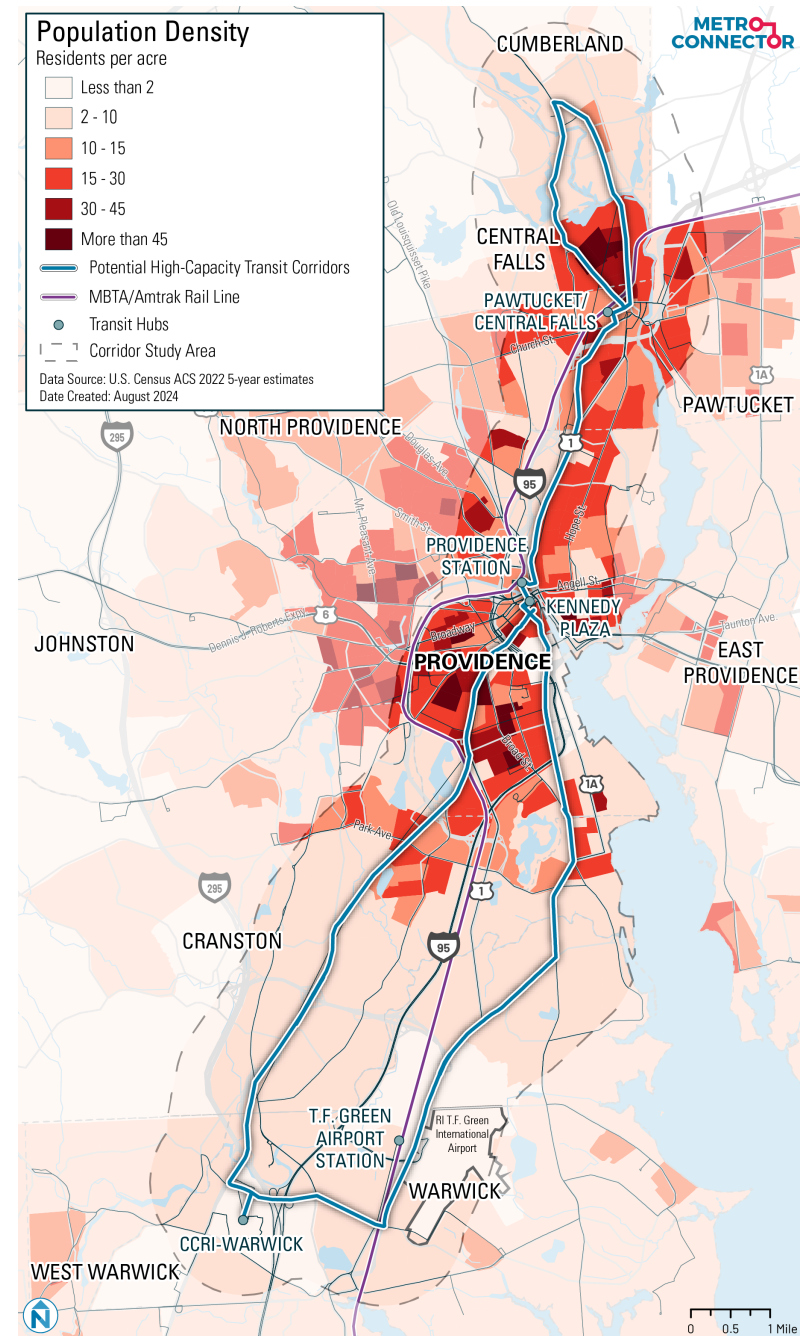


Figure 6-3 Population Density

Socioeconomic Characteristics

In addition to population density, socioeconomic characteristics influence people’s propensity to use transit. While not all these factors are used to calculate transit propensity later in this chapter, it is still important to consider several characteristics when prioritizing transportation equity, including race and ethnicity, income, foreign-born households, vehicle ownership, English proficiency, housing tenure, and transportation costs. Most of the analysis in this section is conducted using Census Block Groups, which are collections of Census Blocks, which are similar to city blocks. Block groups typically have around 250-550 housing units, which is why there are larger Block Groups in lower density areas.

Race and Ethnicity

In the United States, race is highly correlated with income, generational wealth, and other social characteristics. As a result, people of color tend to ride transit at higher rates than white, non-Hispanic residents. Providing equal access to public transit is required by the Federal Transit Administration (FTA) under Title VI of the Civil Rights Act of 1964.

- **Cumberland:** Residents in Valley Falls are primarily white, although there are small concentrations of Asian residents near Cumberland’s border with Central Falls, as well as concentrations of Hispanic residents in the middle of Valley Falls.
- **Central Falls:** There are high concentrations of Hispanic residents throughout the study area, but particularly in Central Falls. There are also high concentrations of Black residents near the town’s border with Pawtucket, as well as a mix of Hispanic and Black residents along one of the potential corridors for high-capacity transit.
- **Pawtucket:** There are high concentrations of white residents along Route 1 in Pawtucket, just east of one of the study corridors. Pawtucket also has a high concentration of black and Hispanic residents, especially east of the Seekonk River.
- **Providence:** Downtown Providence has a mix of white, black, Asian, and Hispanic residents. West End, Elmwood, Upper South Providence, and Lower South Providence all have high concentrations of Black, Hispanic, and Asian residents, while Federal Hill has a high concentration of white residents with some Black and Hispanic residents.
- **Cranston:** Cranston has high concentrations of white residents, as well as a mix of Asian and Hispanic residents, especially in West Cranston.
- **Warwick:** Warwick is primarily white, but there are concentrations of Asian residents north of CCRI.

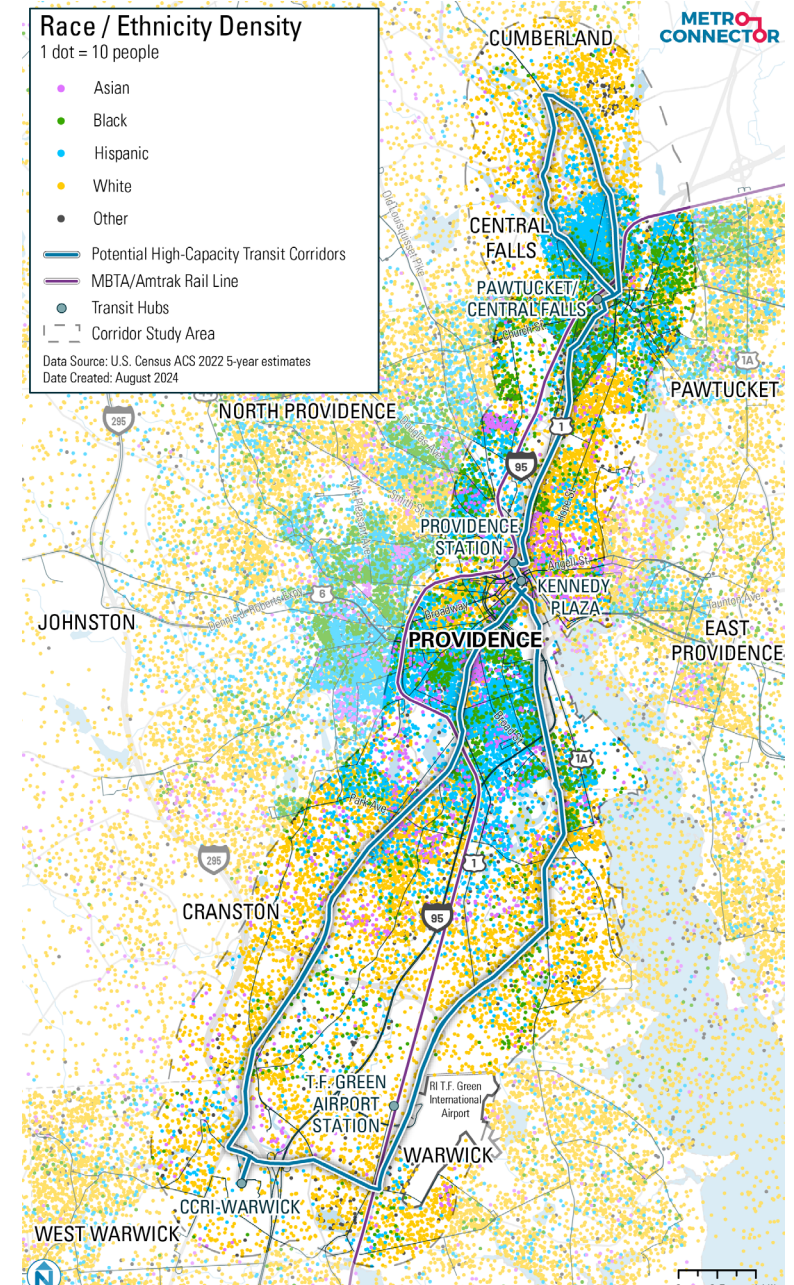


Figure 6-4 Race and Ethnicity

Low-Income Households

Residents with low incomes tend to ride transit more than other demographic groups because it is less expensive than owning a car, and many of these residents may rely on public transit as their primary mode. Understanding where low-income households are can help us understand travel behaviors and inform service recommendations.

- **Cumberland:** There is a concentration of low-income households in the northern tip of the study area in Valley Falls, directly adjacent to one of the potential corridors for high-capacity transit.
- **Central Falls:** Low-income households in Central Falls are concentrated in the southern portion of the city, between two of the potential corridors for high-capacity transit. Larger portions of Central Falls have a higher percentage of low-income households than Cumberland.
- **Pawtucket:** Pawtucket’s low-income households are concentrated in the western area of the town, close to the Seekonk River and adjacent to the Pawtucket/Central Falls commuter rail station.
- **Providence:** Low-income households in Providence are concentrated in Upper and Lower South Providence, Elmwood, and Smith Hill.
- **Cranston:** Cranston has a low percentage of low-income households overall.
- **Warwick:** The only area in Warwick with a high concentration of low-income households is just north of the airport.

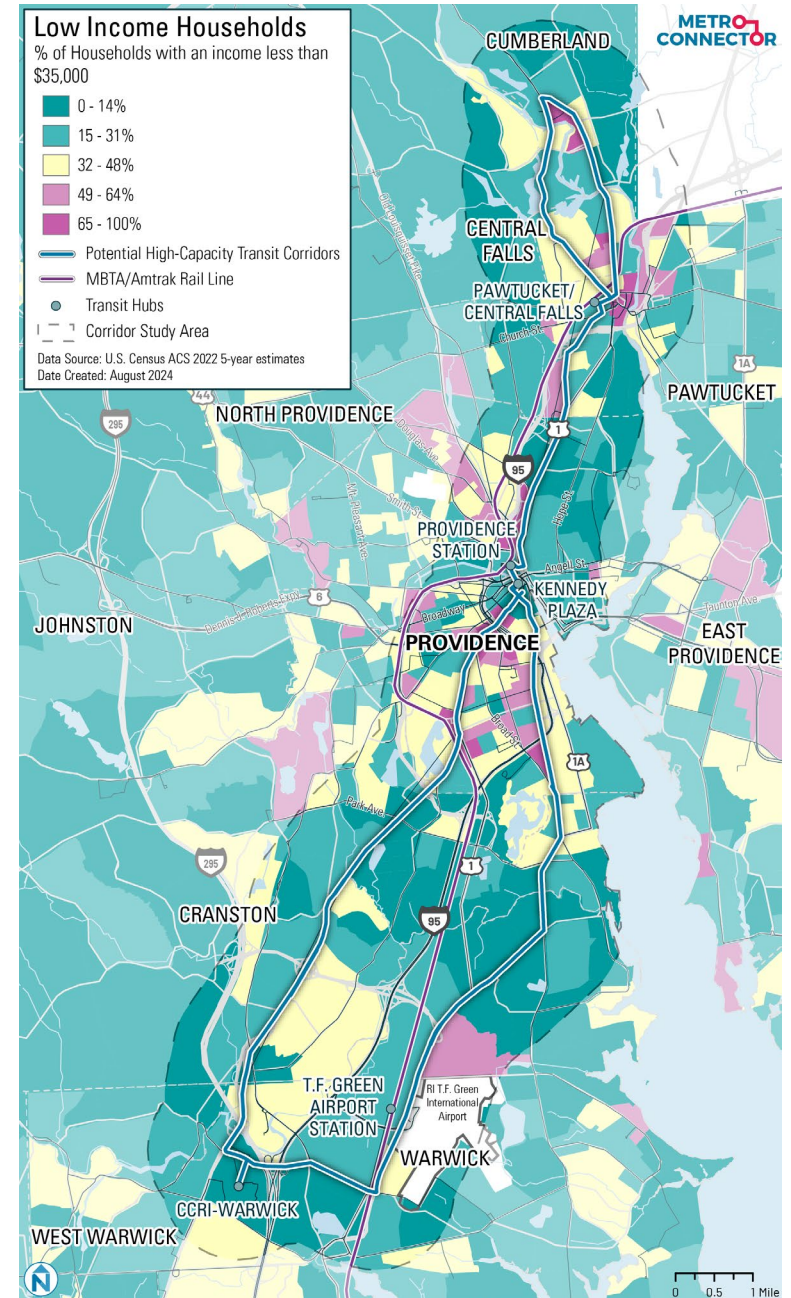


Figure 6-5 Low-Income Households

Foreign-Born Households

Generally, households with foreign-born members are more likely to use transit than native-born residents. In many countries outside the US, public transit use is much more common, so foreign-born residents may be more inclined to use transit when moving here. Immigrant communities may also be more likely to use transit because of the financial burden of arriving in a new country and getting a license, or unfamiliarity navigating different traffic laws. Neighborhoods around the Pawtucket/Central Falls commuter rail station and south of Downtown Providence have the highest percentages of households in the study area with foreign-born occupants.

- Cumberland:** The highest percentage of households with foreign-born occupants in Cumberland is in Valley Falls near the border with Central Falls. Compared with Central Falls and Providence, however, the percentage of households with foreign-born residents is lower in the part of Cumberland within the boundaries of the study area.
- Central Falls:** There is a relatively high percentage of households with foreign-born residents in Central Falls, especially on the municipality's border with Cumberland and in the western portion of the city adjacent with one of the potential corridors for high-capacity transit.
- Pawtucket:** Pawtucket has a low percentage of households with foreign-born residents overall, with the highest percentages directly adjacent to the Pawtucket/Central Falls commuter rail station.
- Providence:** The highest percentage of households with foreign-born residents in Providence within the study area are in Upper and Lower South Providence, West End, Elmwood, and Washington Park. Portions of Smith Hill, Reservoir, and Silver Lake have a high percentage of foreign-born residents in the study area.
- Cranston:** Overall, the percentage of households with foreign-born residents is low throughout Cranston.
- Warwick:** The area north of CCRI has the highest percentage of households with foreign-born residents in Warwick, especially compared with the rest of the municipality, where the percentage is low.

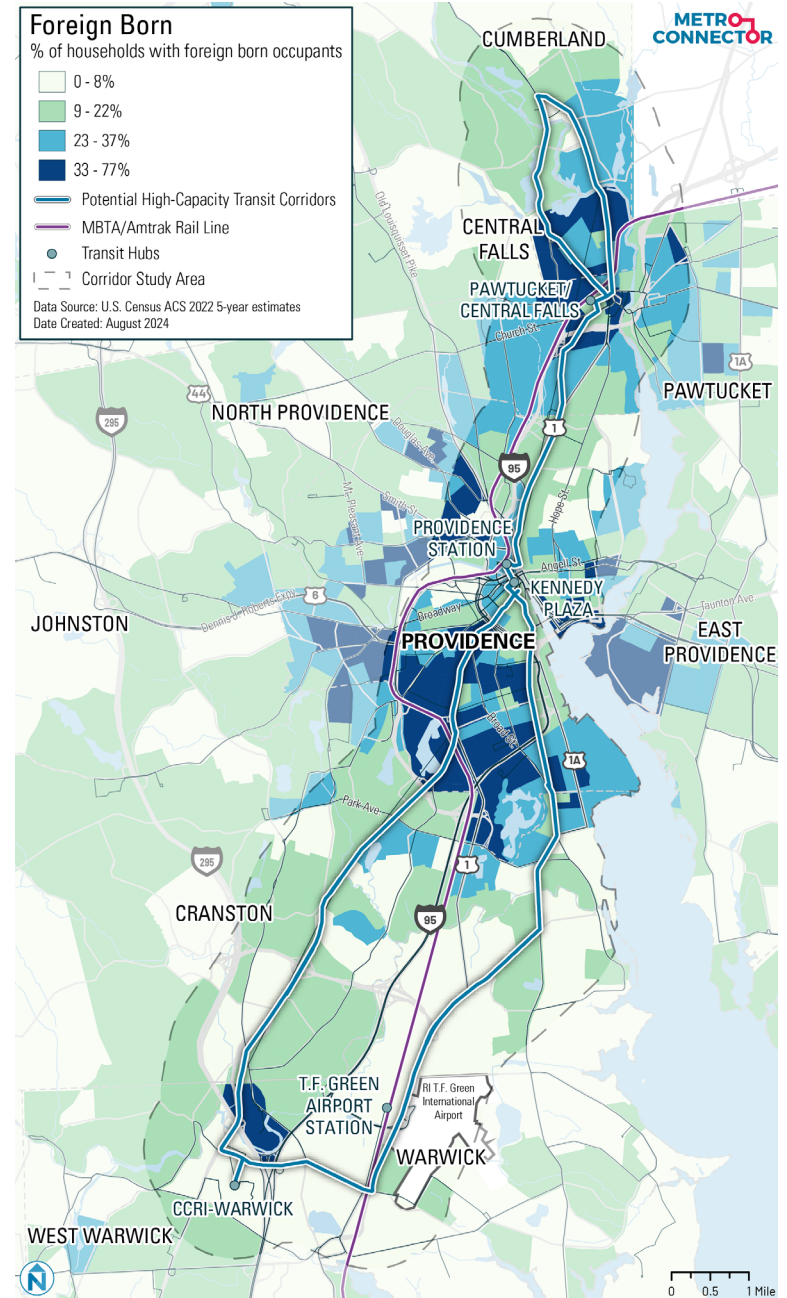


Figure 6-6 Foreign-Born Households

Zero Vehicle Households

People who live in households without access to a personal vehicle are more likely to use transit, either by choice or necessity. Residents living in the urban core, including municipalities like Providence, may choose to live car-free because they have access to jobs and other amenities via public transit or walking. Other residents may use transit because of cost or inability to drive. Neighborhoods around major transit stations, including Providence Station and the Pawtucket/Central Falls commuter rail station, have the highest percentages of households in the study area who do not own a vehicle.

- **Cumberland:** Most of Cumberland has a low percentage of households with zero vehicles, but there is a high concentration of these households in the northern portion of Valley Falls, adjacent to the potential corridors for high-capacity transit.
- **Central Falls:** Neighborhoods in the middle region of Central Falls have a high percentage of households with zero vehicles. The percentage of households with zero vehicles is lower in Central Falls near the town's border with Cumberland.
- **Pawtucket:** West of the Seekonk River and around the Pawtucket/Central Falls commuter rail station are the neighborhoods in Pawtucket with the highest percentage of households that do not own a vehicle.
- **Providence:** Downtown Providence and Federal Hill have the highest concentrations of households that do not own a vehicle in Providence. Parts of Upper and Lower South Providence, Smith Hill, Wanskuck, and Mount Hope also have high percentages of zero-car households, including an area adjacent to North Main Street, one of the corridors with potential for high-capacity transit.
- **Cranston and Warwick:** Except for a small area in Warwick north of CCRI, most households in these two towns have access to at least one vehicle.

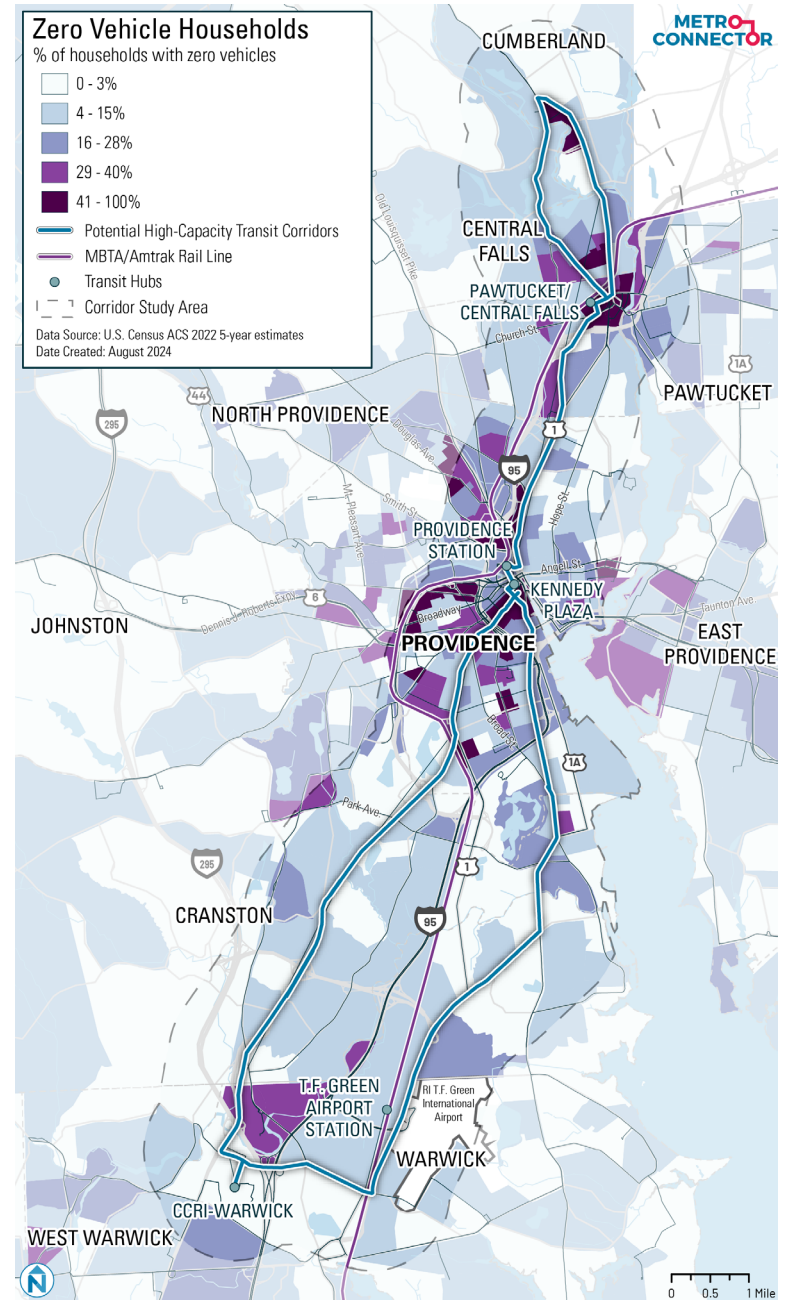


Figure 6-7 Zero Vehicle Households

Limited English Proficiency

Those with limited English proficiency (LEP) are considered a protected class under Title VI. Residents with limited English proficiency should have special consideration for communications and outreach. Residents with LEP are less likely than the general population to ride transit to work but are more likely than the general population to carpool, walk, or bike to work.¹⁶ This indicates that the need for alternatives to driving alone among LEP populations is high, but that accessing transit service can be difficult, either because it does not work for their travel needs or a lack of legibility of the system. These challenges suppress potential ridership.

- **Cumberland:** The percentage of LEP residents is high in Valley Falls, but relatively low in the rest of Cumberland.
- **Central Falls:** There are high concentrations of LEP residents in the northern area of Central Falls, especially on the municipality's border with Cumberland.
- **Pawtucket:** There are relatively low concentrations of LEP residents in Pawtucket, but the area with the highest percentages is around the Seekonk River and adjacent to the Pawtucket/Central Falls commuter rail station.
- **Providence:** LEP residents are most concentrated in Lower South Providence, as well as in West End, Reservoir, and Elmwood.
- **Cranston and Warwick:** Cranston and Warwick have low percentages of LEP residents. The area of the two municipalities with the highest concentrations of LEP residents is Cranston's border with Providence.

Table 6-2 Languages of LEP Residents by Municipality

Municipality	Spanish	Indo-European	Asian & Pacific Island	Other
Cumberland	32%	59%	9%	0%
Central Falls	84%	15%	0%	1%
Pawtucket	44%	49%	3%	4%
Providence	80%	7%	9%	4%
Cranston	59%	18%	20%	3%
Warwick	38%	45%	16%	2%
Study Area	68%	20%	9%	3%

¹⁶ US Census 2022

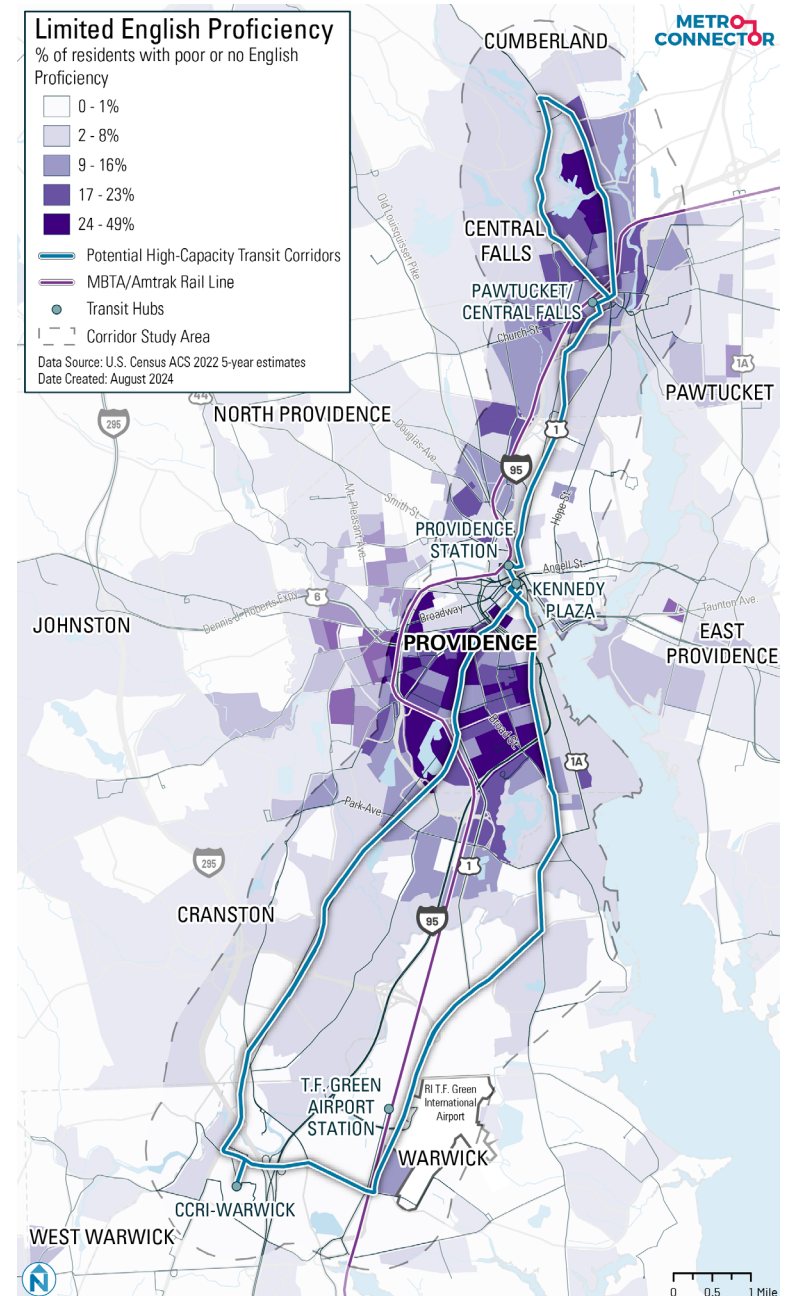


Figure 6-8 Limited English

Renters

Renters are much more likely to experience housing insecurity than homeowners due to fluctuating economic conditions while simultaneously being more transit-dependent and likely to live in car-free households, so it is important to consider them when assessing the need for high-capacity transit. Locations within the study area with the highest percentage of households occupied by renters include Federal Hill, Downtown Providence, western Pawtucket, significant portions of Central Falls, and north of CCRI in Warwick.

- **Cumberland:** The percentage of households occupied by renters is highest in the northern portion of Valley Falls but is also relatively high in areas of Cumberland near the town's border with Central Falls.
- **Central Falls:** Most of Central Falls has a relatively high percentage of households occupied by renters, but these households are especially concentrated in the southern area of Central Falls.
- **Pawtucket:** The percentage of renters in Pawtucket is highest around to the Pawtucket/Central Falls commuter rail station, as well as at the municipality's southern border with Providence, adjacent to one of the study corridors.
- **Providence:** Multiple neighborhoods in Providence have a very high percentage of households occupied by renters, including Federal Hill, Downtown, Smith Hill, and Elmwood. Other neighborhoods, including West End, Fox Point, Mount Hope, and Lower South Providence, have a relatively high percentage of renters as well.
- **Cranston:** Most of Cranston has a low percentage of renters, with the highest percentages in central Cranston.
- **Warwick:** There is a very high percentage of renters in Warwick north of CCRI and a relatively high percentage northeast of the airport, but the rest of the municipality has a relatively low percentage of renters.

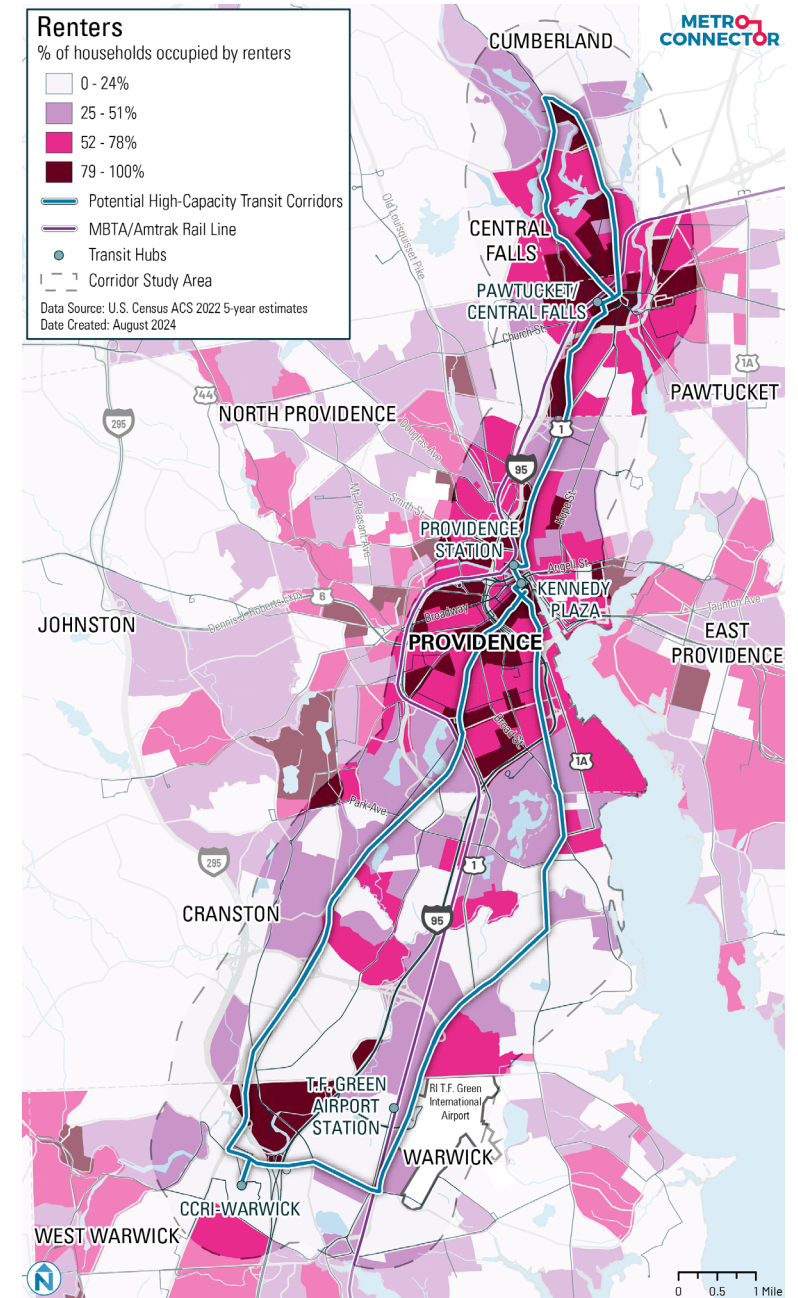


Figure 6-9 Renters

Transportation Costs

Figure 6-10 shows transportation costs throughout the study area, displaying data from the Housing and Transportation Affordability Index. Transportation costs are typically a household's second-largest expenditure and traditional measures of housing affordability tend to ignore transportation costs. Denser areas are characterized by shorter trip lengths and usually better walking, biking, and transit infrastructure which leads to lower transportation costs. Increasing access to transit and building more mixed-used, walkable developments can lower transportation costs.

- **Cumberland:** Transportation costs are moderate or high throughout Cumberland, with some neighborhoods experiencing very low transportation costs near the eastern border of Valley Falls, adjacent to one of the potential corridors for high-capacity transit.
- **Central Falls:** Transportation costs are relatively low in parts of Central Falls, especially in the eastern and southern parts of the municipality.
- **Pawtucket:** Pawtucket has low transportation costs in households directly around the Pawtucket/Central Falls commuter rail station, in addition to neighborhoods on the western side of the Seekonk River and near the town's border with Central Falls. Transportation costs are moderate in the rest of the municipality within the study area.
- **Providence:** Transportation costs are low in many neighborhoods throughout Providence, especially in Downtown, Upper and Lower South Providence, Federal Hill, West End, Fox Point and Smith Hill.
- **Cranston:** Transportation costs are moderate throughout Cranston but are lower in West Cranston compared with the eastern region of the municipality.
- **Warwick:** Transportation costs are moderate throughout Warwick and overall, slightly lower than in Cranston. Costs are lowest in Warwick just north of CCRI Warwick.

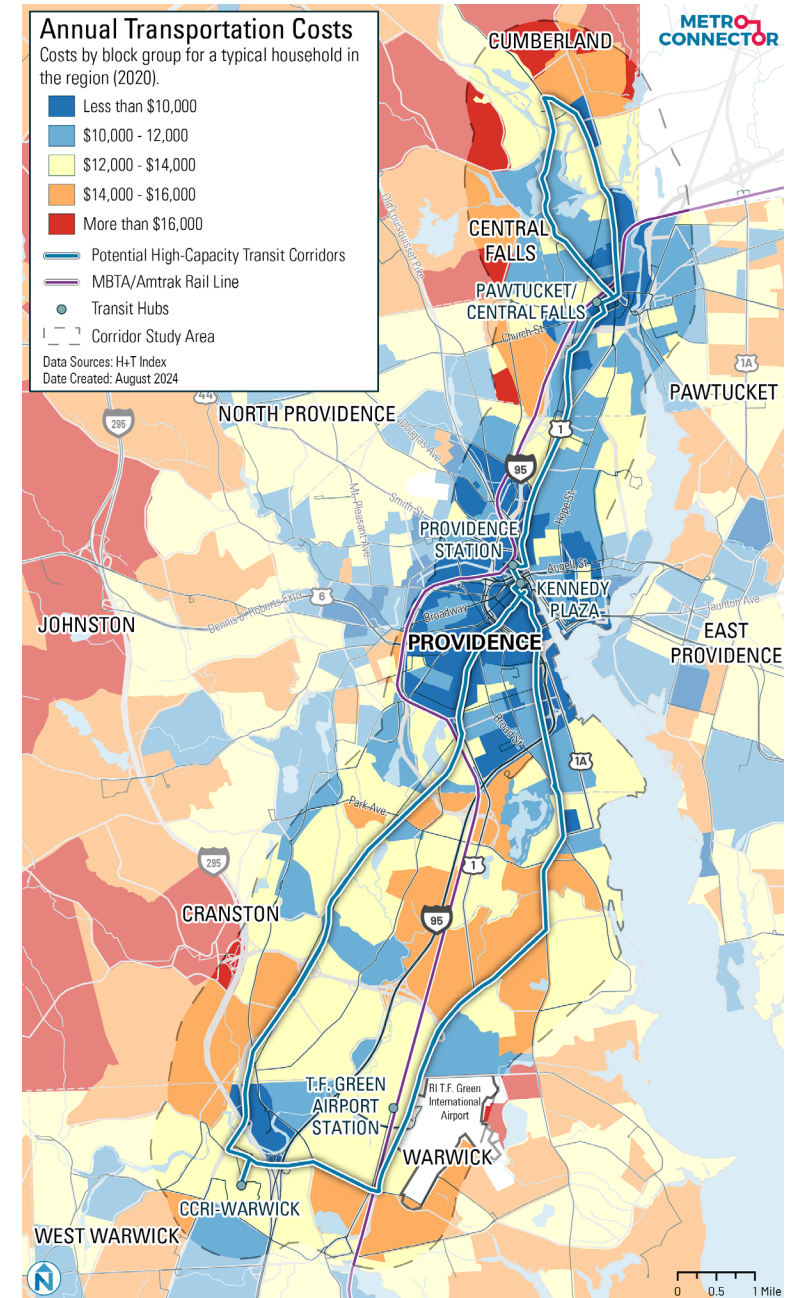


Figure 6-10 Transportation Costs

Socioeconomic Characteristics and Transit Propensity

When many residents who are likely to ride transit cluster together, they influence the underlying demand for transit to an extent that is not captured when only considering population density. In a given location, groups of people from transit-supportive demographics may be too small individually to reveal significant demand for transit service. However, the clustering of people with multiple transit propensity characteristics increases transit demand. Similarly, in places where transit-supportive demographics are underrepresented, transit demand may be lower than population density alone suggests. To take this into account, this analysis uses a transit propensity factor to measure relative demand for transit. Transit propensity factors are created by comparing journey-to-work data for select demographics in Rhode Island. A value of one means a group is as likely to take transit as an average study area resident. Anything below one means a group is less likely to take transit than an average resident, and above one means a group is more likely to take transit.

Residents more likely to take transit to work

Residents in the study area with the highest propensity for transit are those without a vehicle, who are almost eight times more likely to ride transit than the average person. Households that have one vehicle also have a higher-than-average propensity for transit, likely because there is usually more than one worker per household. Black residents are twice as likely to take transit and residents whose income is less than \$25,000 are also more likely than average to take transit. Households with one car and foreign-born residents are also more likely to take transit than average, as are households with Asian and Hispanic residents, and those of other races.

Residents less likely to take transit to work

Residents with three or more cars are the least likely to take transit, while residents with two or more cars or incomes over \$35,000 are also less likely than average to take transit. White residents in the study area are less likely than average to take transit, especially compared with other races and ethnicities. Households with native-born residents are also slightly less likely to take transit than the average household.

Table 6-3 Transit Propensity by Demographic Group

Demographic Group	Relative Transit Propensity
Race and Ethnicity	
White (not Hispanic)	0.73
Black (not Hispanic)	2.05
Asian (not Hispanic)	1.22
Other Race (not Hispanic)	1.63
Hispanic	1.43
Vehicle Ownership	
No Car	7.70
One Car	1.24
Two Cars	0.70
Three or More Cars	0.46
Country of Origin	
Native	0.95
Foreign	1.21
Household Income	
Less than \$10,000	1.54
\$10,000 - \$15,000	1.44
\$15,000 - \$25,000	1.40
\$25,000 - \$35,000	1.09
\$35,000 - \$65,000	0.83
More than \$65,000	0.80

Transit Propensity

Transit propensity displays the proportional weighted factor for all the relative transit propensity values on the previous page to display in general where residents are more or less likely to take transit compared to the average study area resident.

- Cumberland:** The southern region of Valley Falls has a transit index factor just above or below one, but in the neighborhoods at the northern tip of the study area, adjacent to the potential corridors for high-capacity transit, the transit index factor is 1.5 or greater, meaning that residents are more likely than average to take transit. Residents living west of the Blackstone River and just north of the town's border with Central Falls are also more likely than average to take transit.
- Central Falls:** All of Central Falls has a transit index factor of at least one, meaning that most residents are as likely to take transit as the average study area resident. Residents in the southern areas of the city, where the transit index factor is 1.5 or greater, are more likely to take transit in Central Falls than the rest of the municipality.
- Pawtucket:** Residents around the Pawtucket/Central Falls commuter rail station have the highest transit propensity in Pawtucket, and transit propensity is relatively high in Pawtucket overall, especially adjacent to the corridor with potential for high-capacity transit. Transit propensity is lower east of the Seekonk River.
- Providence:** Residents south of Downtown Providence have the highest transit propensity in the city, and residents in many of those neighborhoods are more likely than average to take transit.
- Cranston:** Residents' propensity for transit is average throughout Cranston, with some areas east of I-95 having a lower-than-average propensity for transit.
- Warwick:** Residents have a high transit propensity west of T.F. Green Airport adjacent to the corridor with potential for high-capacity transit, but other areas of Warwick, particularly immediately surrounding the airport and CCRI, have a below average propensity for transit.

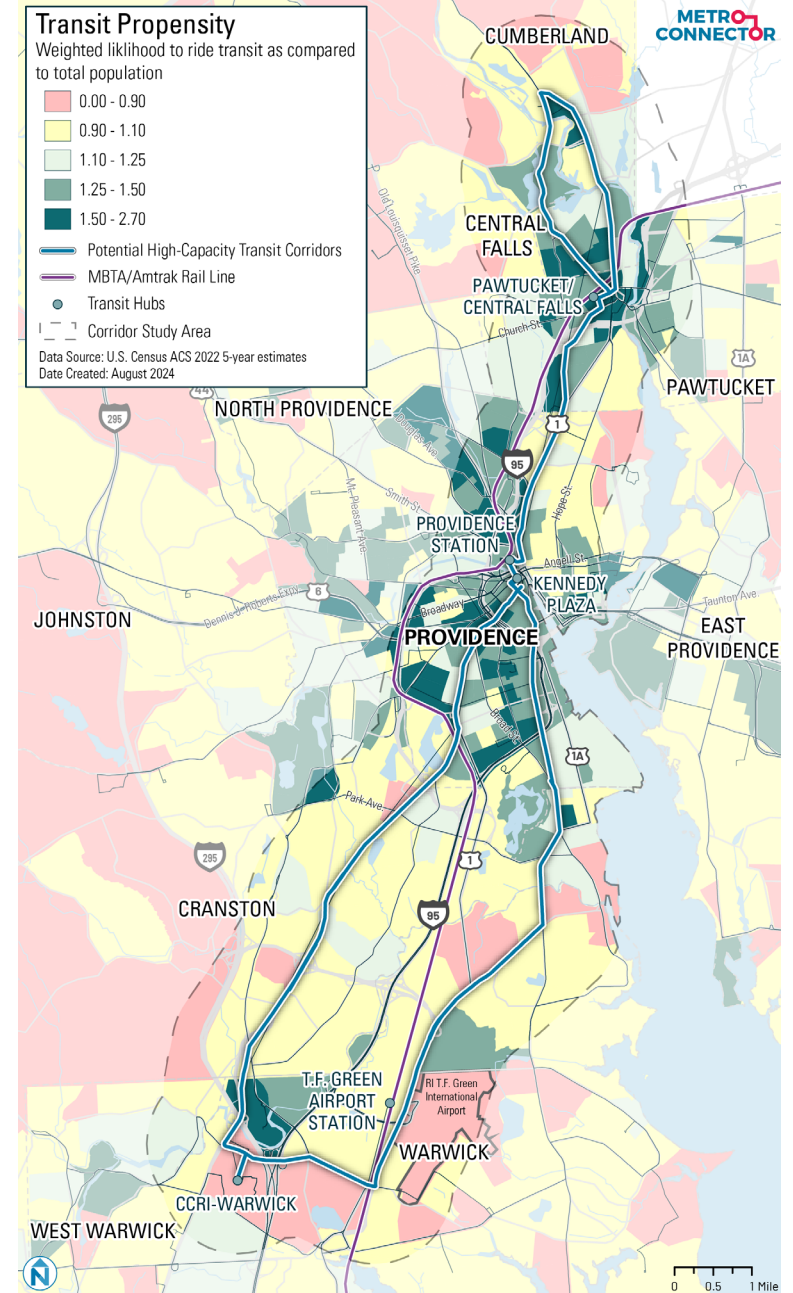


Figure 6-11 Transit Propensity

Adjusted Population-Based Demand

When demographic factors are considered in the context of population density-based transit demand, underlying demand is effectively higher in some areas and lower in others. This underlying demand can be called the “adjusted population density” and is calculated by multiplying the population density by the transit index factor. Transit demand intensifies in urban areas when considering socioeconomic characteristics and demand diminishes in sprawling areas.

Adjusted population density is highest in Providence and Central Falls, particularly around the Central Falls/Pawtucket commuter rail station. Although the population density around the Providence metro area shows that there is significant demand for transit, it is important to recognize that demand drops off steeply outside the metro area in most of the state. Outside of the urban core, including Cranston and Warwick in the study area, much of the state does not have an environment in which traditional, fixed-route transit will run successfully based on residential density.

- **Cumberland:** Most of Cumberland has a low adjusted population density, especially compared with neighboring Central Falls and Pawtucket. The only area of Cumberland with moderate adjusted population density is neighborhoods in Valley Falls east of the Blackstone River and north of John and Chambers Streets.
- **Central Falls:** Central Falls has high adjusted population density throughout the municipality, especially in the southern portion of the municipality and between the two potential corridors for high-capacity transit.
- **Pawtucket:** Adjusted population density is highest in Pawtucket on the east and west sides of the Seekonk River and west of the Pawtucket/Central Falls commuter rail station.
- **Providence:** Adjusted population density is highest in Providence in the West End and Elmwood neighborhoods, as well as in Lower and Upper South Providence and portions of Washington Park.
- **Cranston:** Cranston’s adjusted population density is relatively low throughout the municipality, similar to its unadjusted density. The only areas with moderately high adjusted population density are in the northern portion of the city where it borders Providence.
- **Warwick:** The adjusted population density in Warwick is very low throughout.

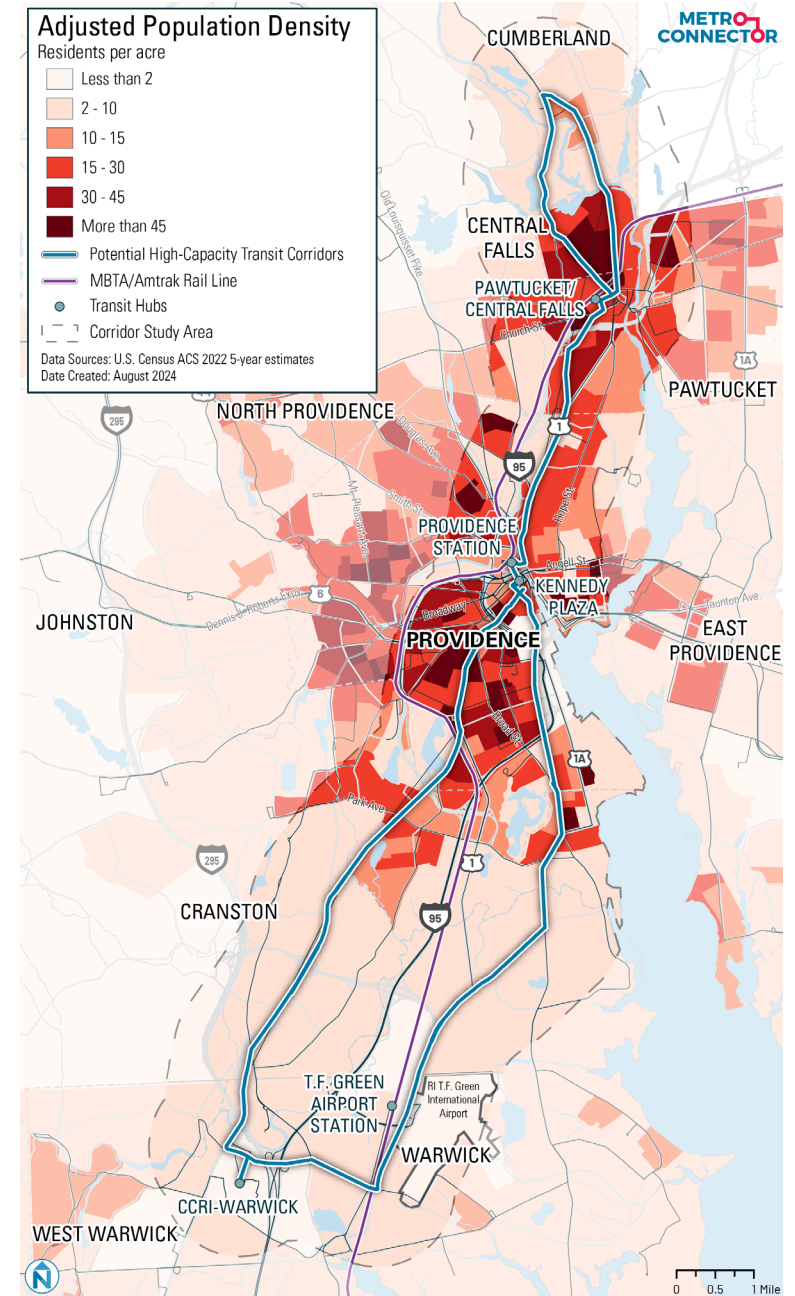


Figure 6-12 Adjusted Population Density

Jobs and Economic Activity-Based Demand

This section of the chapter describes demand for transit based on jobs and other forms of economic activity. In other words, it analyzes destinations people are trying to reach each day, as opposed to the places where people typically begin their trips each day.

Commuting is the most frequent and regular trip that most people, including transit riders, make. As a result, employment density is a major indicator of transit demand. Employment density is also an important indicator of demand because it represents other types of “ancillary” travel activity; customers, clients, patients, students, and visitors are also drawn to employment centers, just like employees. Some employment centers, like office buildings, warehouse districts, and manufacturing plants have less of this type of ancillary demand, while other employment centers, like hospitals and universities, generally have more of this type of ancillary demand. As job density increases, the demand for transit grows, particularly for more frequent service.

Providence has the highest job density in the study area with more than 25 jobs per acre west of Kennedy Plaza and in Downtown Providence, especially surrounding Providence Station. The only other location in the study area with more than 25 jobs per acre is adjacent to the Pawtucket/Central Falls commuter rail station.

- **Cumberland:** Job density is very low in Cumberland, including in Valley Falls.
- **Central Falls:** Employment density is low in Central Falls, with the highest density of 10 – 15 jobs per acre in the central portion of the municipality.
- **Pawtucket:** Job density in Pawtucket is relatively low except east of the Pawtucket/Central Falls commuter rail station.
- **Providence:** Employment density in Providence is very high Downtown, as well as in College Hill, Washington Park, and South Providence. Job density drops off sharply south of Downtown Providence and is much lower in Federal Hill and West End in comparison to the northern portion of the city.
- **Cranston and Warwick:** Employment density is low in Cranston especially compared to Providence, except for the shopping districts along Park Avenue, and is relatively low in Warwick as well except around the airport and CCRI.

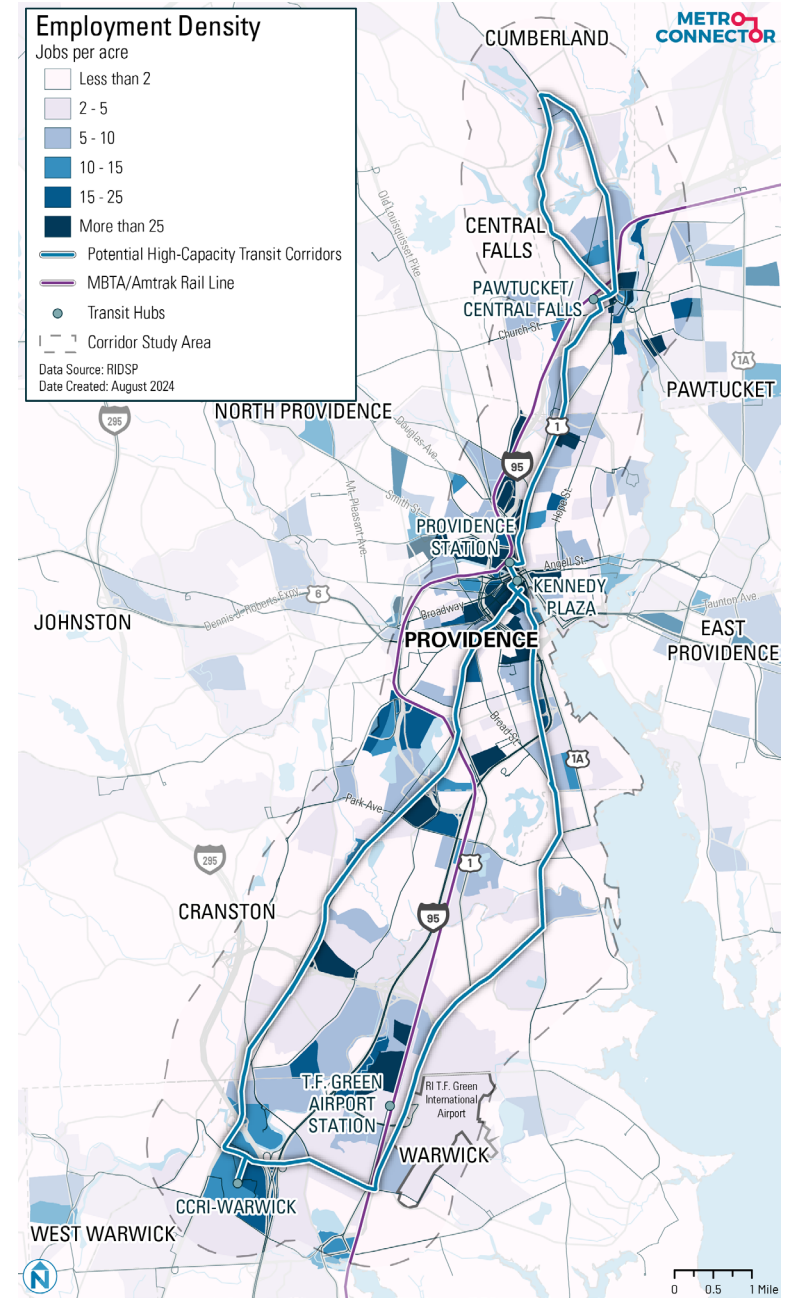


Figure 6-13 Employment Density

Customers, Clients, Patients, and Students

Many job sites attract travelers who are not employed at the site and can be broadly characterized as customers, clients, patients, and students. Many non-commute transit trips have destinations at these places, which include restaurants, grocery stores, schools, universities, and hospitals. Consequently, industries that attract customers, clients, patients, and students are associated with higher levels of transit ridership than other industries. On weekdays in 2023, almost half of trips (46%) in the study area were school, shopping, errands, and other trips most likely associated with being a customer, client, patient or student, while only 12% of trips were work trips.

- Cumberland:** There is a moderate percentage of jobs with customers, clients, patients, and students within Valley Falls, especially in the northern tip of the study area between two of the potential corridors for high-capacity transit, east of the Blackstone River.
- Central Falls:** Portions of the study corridors in Central Falls have a moderately high percentage of this type of jobs, with some in the southern area of the municipality and some pockets farther north.
- Pawtucket:** The area to the southeast of the Pawtucket/Central Falls commuter rail station in Pawtucket has a high percentage of this type of job, although the area directly around the station has fewer in comparison. Neighborhoods on the town's border with Providence and on each side of the Seekonk River also have high concentrations of this type of job.
- Providence:** The area east of Providence Station and surrounding Kennedy Plaza in Providence, which is just east of the corridors with potential for high-capacity transit, has a high percentage of this type of job as well.
- Cranston:** Most of the study area south of Providence has a relatively low percentage of these jobs, but there are some areas of Cranston in the western portion of the study area and small pockets of the municipality that have a high percentage of this type of job.
- Warwick:** Most of Warwick has a low percentage of this type of job but the area around CCRI Warwick has a relatively high percentage, especially compared to the rest of the municipality.

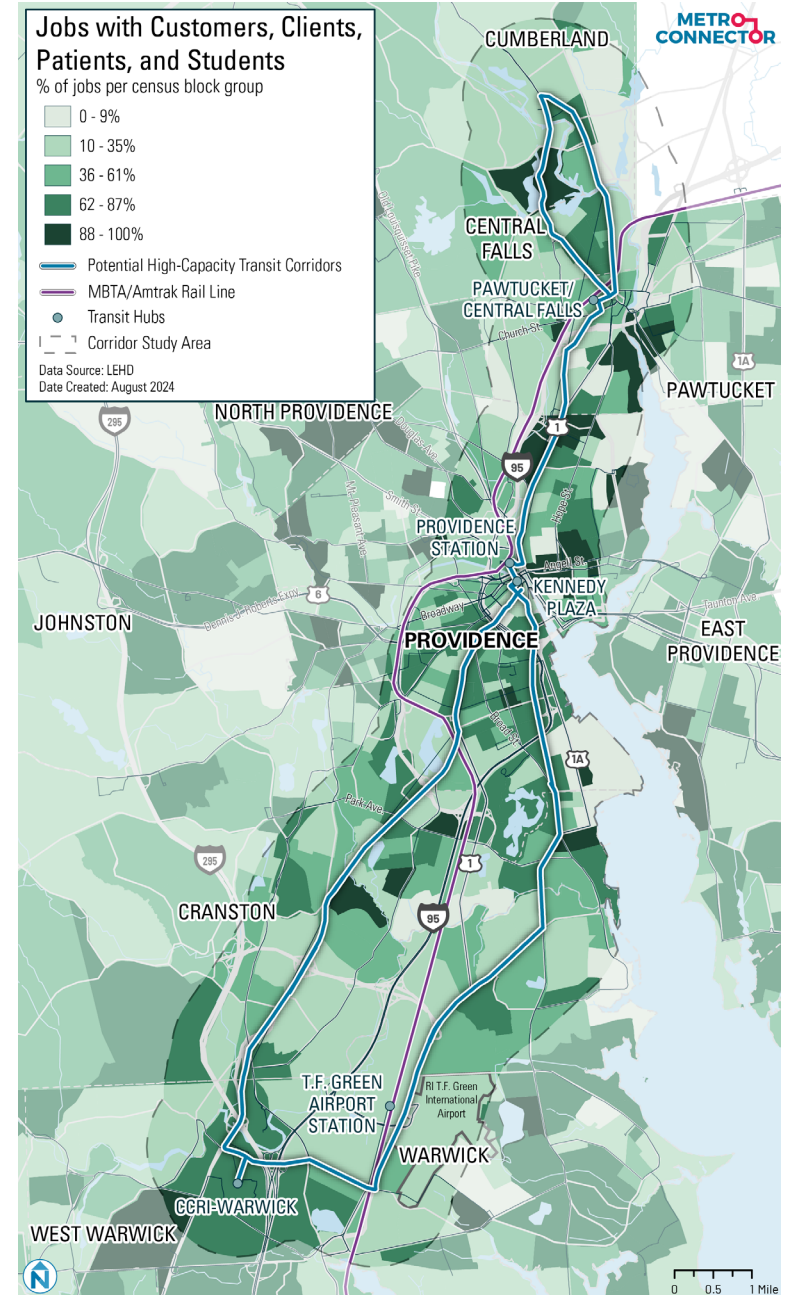


Figure 6-14 Customers, Clients, Students, and Patients

Jobs Held by Women

Women benefit most from all day frequent service and are more likely to take transit in general. Women have different travel patterns than men, and are more likely to work multiple jobs, work part time, and trip chain—all of which create stronger markets for all-day frequent service. Many places in the study area have uneven gender distributions of their employees. Areas where more jobs are held by men are more likely to be dominated by heavy industry and warehouses, among others.

There are significant portions of Providence, Central Falls, and Pawtucket where employees are 60% or more women, which indicates places where all-day frequent service is particularly important. Cranston and Warwick are less dense overall but portions of Warwick, particularly around CCRI, have neighborhoods where employees are 60% or more women.

- Cumberland:** The manufacturing district in Cumberland is dominated by male workers, although there is a neighborhood in Valley Falls directly adjacent to one of the potential corridors for high-capacity transit where a high percentage of the jobs are held by women.
- Central Falls:** The area of Central Falls between study corridors has a high percentage of jobs held by women, but the eastern region of Central Falls near the city's border with Cumberland has jobs with a higher percentage of male workers.
- Pawtucket:** Pawtucket has a moderate percentage of jobs held by women, especially near the town's border with Providence and adjacent to the Seekonk River. A small area near the Pawtucket/Central Falls commuter rail station has a very high percentage of jobs held by women.
- Providence:** Providence is the only municipality in the study area with multiple neighborhoods that have a very high percentage of jobs that are held by women, including Upper and Lower South Providence. However, the Port in Washington Park is dominated by male workers, and there is a high percentage of male workers in South Elmwood.
- Cranston:** Most of the study area south of Providence has lower percentage of jobs held by women, but there are some areas of Cranston, close to where the city borders Providence, that have a moderate percentage of jobs that are held by women. Central Cranston has a lower percentage of jobs held by women compared to the rest of the municipality.
- Warwick:** Much of Warwick has an even split between jobs held by both genders but the area around CCRI Warwick has a relatively high percentage of women workers, especially compared to the rest of the municipality.

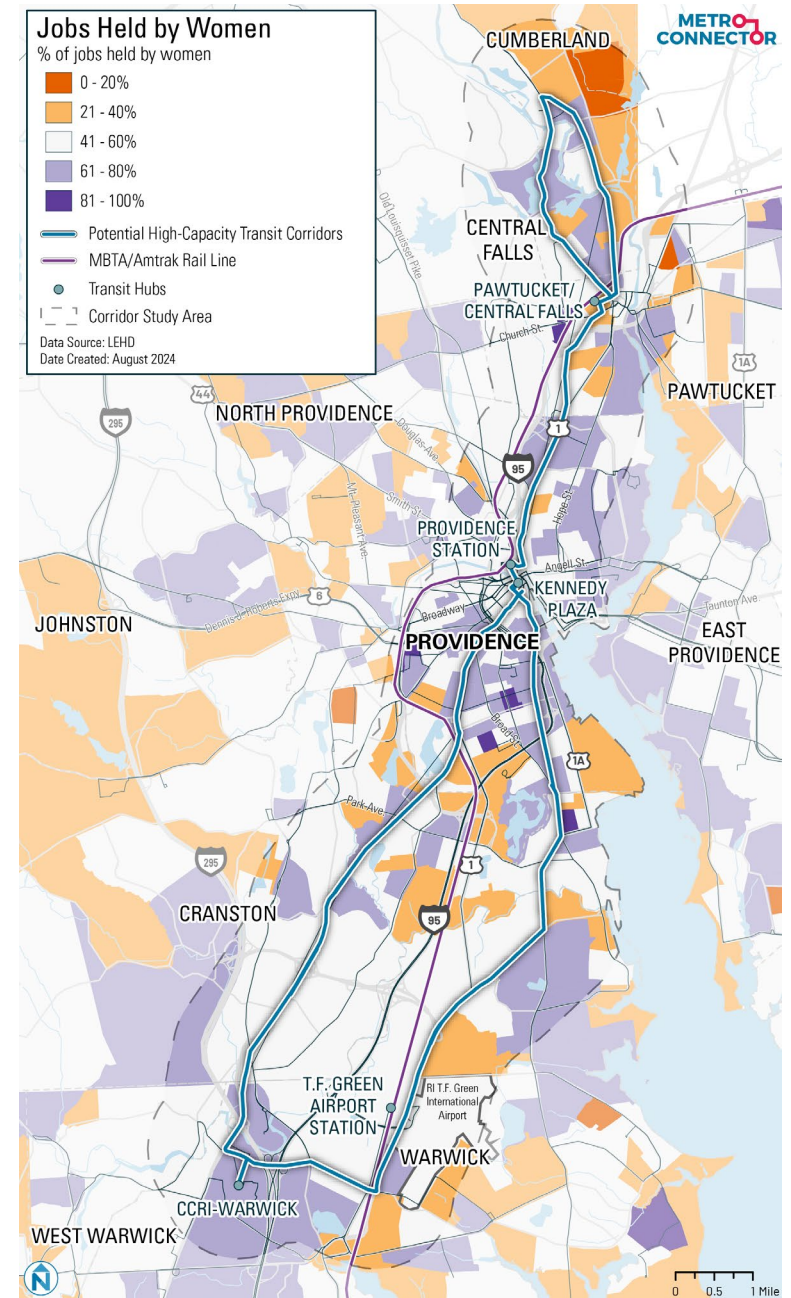


Figure 6-15 Jobs Held By Women

Adjusted Employment Density

Much like the resident socioeconomic factors described earlier in this chapter, different job types are associated with different levels of transit demand. Because industries with customers, clients, patients, and students create more demand, this market profile adjusts employment-based transit demand by the following factors, which are based on national transit-ridership research.

Adjusted employment density is highest around major transit stations, including the Pawtucket/Central Falls commuter rail station and Providence Station, as well as the Airport Station in Warwick.

Table 6-4 Demand Adjustment Factor by Job Type

Job Type	Demand Adjustment Factor
Jobs with Customers, Clients, Patients, and Students	1.3
Other Jobs	0.9

- **Cumberland:** Cumberland has very low adjusted employment density overall.
- **Central Falls:** Adjusted employment density is low in Central Falls overall, with the highest adjusted employment density in the central region of the municipality, between the two potential corridors for high-capacity transit.
- **Pawtucket:** Adjusted employment density is low in Pawtucket overall as well, but it is relatively high directly around the commuter rail station.
- **Providence:** Adjusted employment density is high in some areas of Providence, including Downtown and Federal Hill, as well as parts of Elmwood.
- **Cranston:** Cranston has low adjusted employment density overall.
- **Warwick:** Warwick has higher adjusted employment density than Cranston, especially around the airport as well as near CCRI.

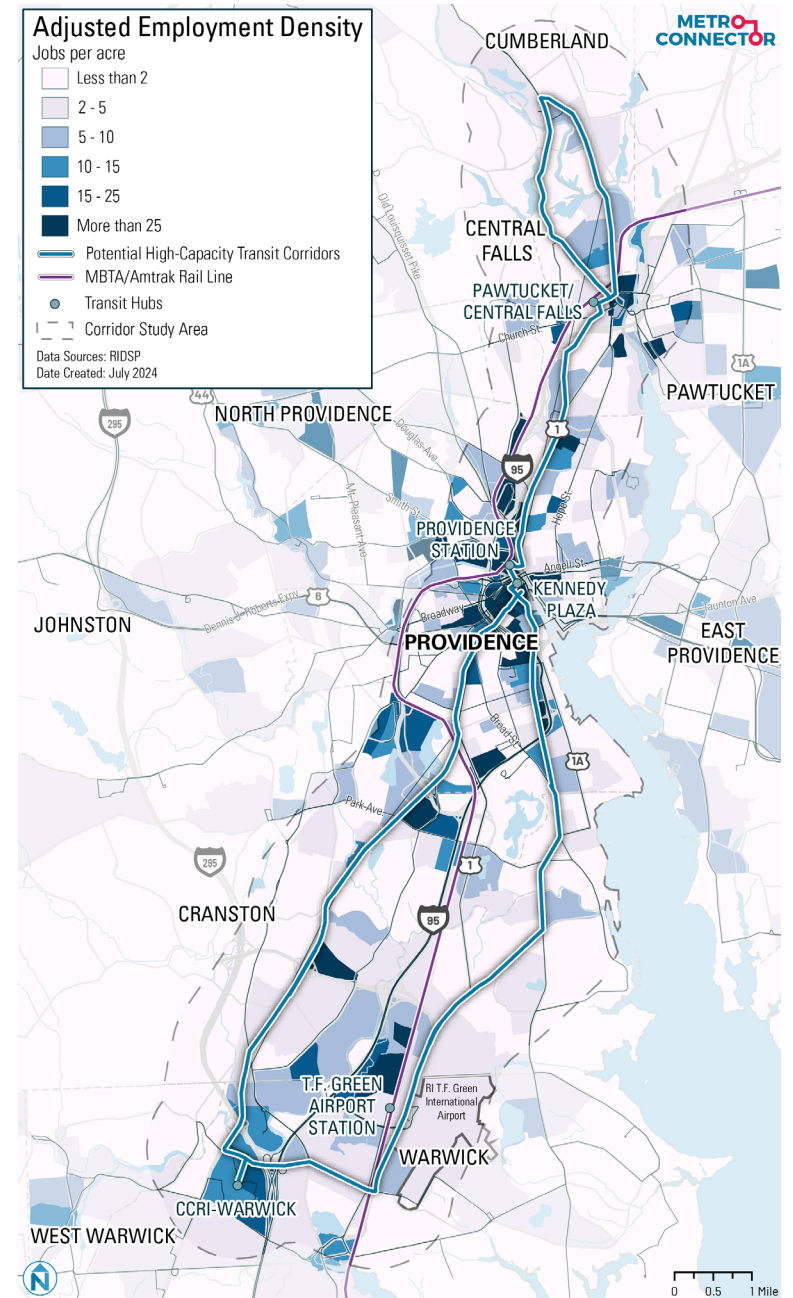


Figure 6-16 Adjusted Employment Density

Non-Traditional Commuters

Workers who make one or more work trips outside peak periods are more likely to have a low income than peak-period commuters. They are also more likely to have shifts that change on a weekly—or even daily—basis. Workers with varied schedules often have variable transit travel times depending on the times and days they work. Figure 6-17 shows where non-traditional commuters live. The best way to improve service for off-peak commuters is to provide more frequent off-peak service, which is typically a feature of rapid transit.

Areas where workers would benefit the most from more frequent off-peak and weekend service include South Providence, Downtown Providence, and north of CCRI in Warwick.

- **Cumberland:** Valley Falls in Cumberland has a moderate percentage of non-traditional commuters, particularly between two of the potential corridors for high-capacity transit. The percentage is lower in the eastern region of Valley Falls.
- **Central Falls:** Central Falls has a moderate percentage of non-traditional commuters on the municipality's border with Cumberland, but the percentage of this type of worker is generally lower than Cumberland. However, there is an area in the northeastern region of the municipality where the percentage of non-traditional commuters is high.
- **Pawtucket:** Pawtucket has a low percentage of off-peak commuters overall, with a higher percentage on the town's border with Providence, just west of the Seekonk River.
- **Providence:** Providence has the highest percentage of non-traditional workers compared with all the other municipalities in the study area. Neighborhoods within Providence where there is a high percentage of this population include South Providence, Downtown, and Washington Park.
- **Cranston:** The percentage of off-peak commuters in Cranston is low overall.
- **Warwick:** The percentage of non-traditional workers in Warwick is especially low around CCRI, although just north of the campus, the percentage of these workers is particularly high.

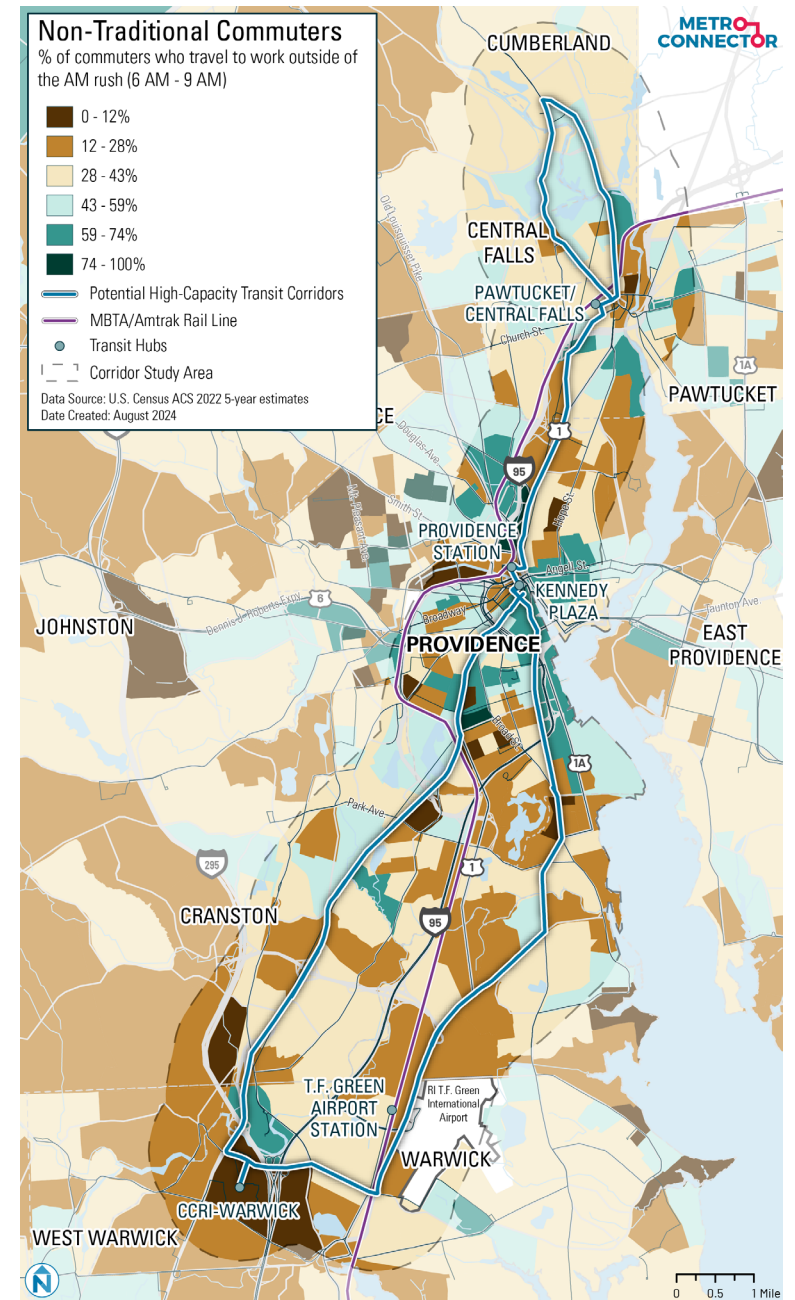


Figure 6-17 Non-Traditional Commuters

Land-Use Mix

Although population and employment density are excellent indicators of transit demand, land-use mix is also a critical indicator. A mix of land use in one place can produce even more demand than any one type of land use alone. Places where people are working, living, shopping, going to appointments, or recreating typically see steady activity levels throughout the day, evening, and on weekends, whereas places with solely employment or residential density have shorter, more defined windows of high travel demand.

Land use is the most mixed in Downtown Providence, and relatively less mixed throughout the rest of the study area, although some municipalities have regions where uses are mixed.

- **Cumberland:** Both population and employment density are very low in Cumberland, making land use mix in the municipality low overall and the town itself less supportive of transit than other parts of the study area.
- **Central Falls:** Residential density is high throughout Central Falls so land use mix is low throughout much of the municipality, but there is an area of mixed use in the middle of the city.
- **Pawtucket:** There are areas of Pawtucket with both high employment density and high residential density, but land use mix is low throughout Pawtucket.
- **Providence:** Land uses are very mixed and highly supportive of transit primarily in Downtown Providence, as well as parts of Elmwood. Areas such as Washington Park and around Providence Station have more employment density, while Federal Hill and South Providence have high residential density, making these areas less supportive of transit.
- **Cranston and Warwick:** Employment density is moderately high in both Cranston and Warwick, but residential density is less so, making the land use mix in both municipalities low overall.

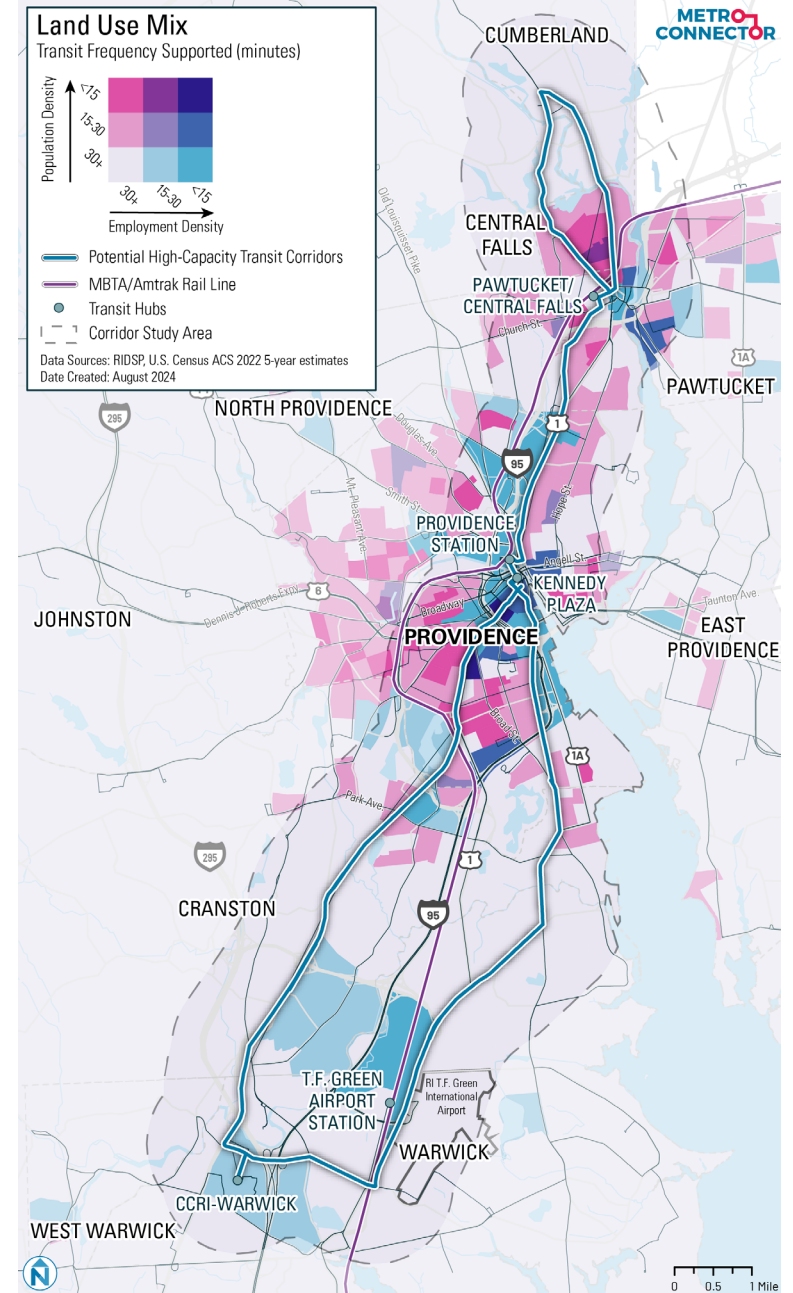


Figure 6-18 Land-Use Mix

Intersection Density

The pedestrian environment is a major consideration for transit usage since most transit riders walk between their origin or destination and their transit stop. A safe, comfortable, walkable environment is more conducive to transit ridership. Intersection density, shown in Figure 6-19, is a good proxy for walkability because a high density of intersections within a grid typically indicates a well-connected pedestrian environment. Factors that affect walkability and transit ridership include, but are not limited to:

- Sidewalks, crosswalks, and lighting
- Proximity to diverse sets of housing, services, offices, and other employment sites
- Transit availability and parking price

Intersection density is highest in Providence, particularly in Downtown Providence and Federal Hill. The Mount Hope and Elmwood neighborhoods in Providence are also moderately walkable, as is Pawtucket south of the Pawtucket/Central Falls commuter rail station almost to the town's border with Providence. Northwestern Cranston and Central Falls have some walkability but other areas that have poor pedestrian environments and where walkability is limited include much of Warwick and Cumberland.

- **Cumberland:** Valley Falls has the highest walkability in Cumberland, but intersection density throughout the municipality is low overall.
- **Central Falls:** The middle region of Central Falls, between two of the potential corridors for high-capacity transit, has the highest walkability in the municipality.
- **Pawtucket:** Walkability is highest in Pawtucket immediately south of the Pawtucket/Central Falls commuter rail station almost to the town's border with Providence. This is adjacent to the corridors with potential for high-capacity transit.
- **Providence:** Providence has very high walkability in Downtown Providence and Federal Hill, and moderately high walkability in West End and Lower South Providence. College Hill and Mount Hope also have moderate walkability.
- **Cranston:** Parts of West Cranston have moderate walkability, but most of Cranston has low walkability.
- **Warwick:** Most of Warwick has low walkability.

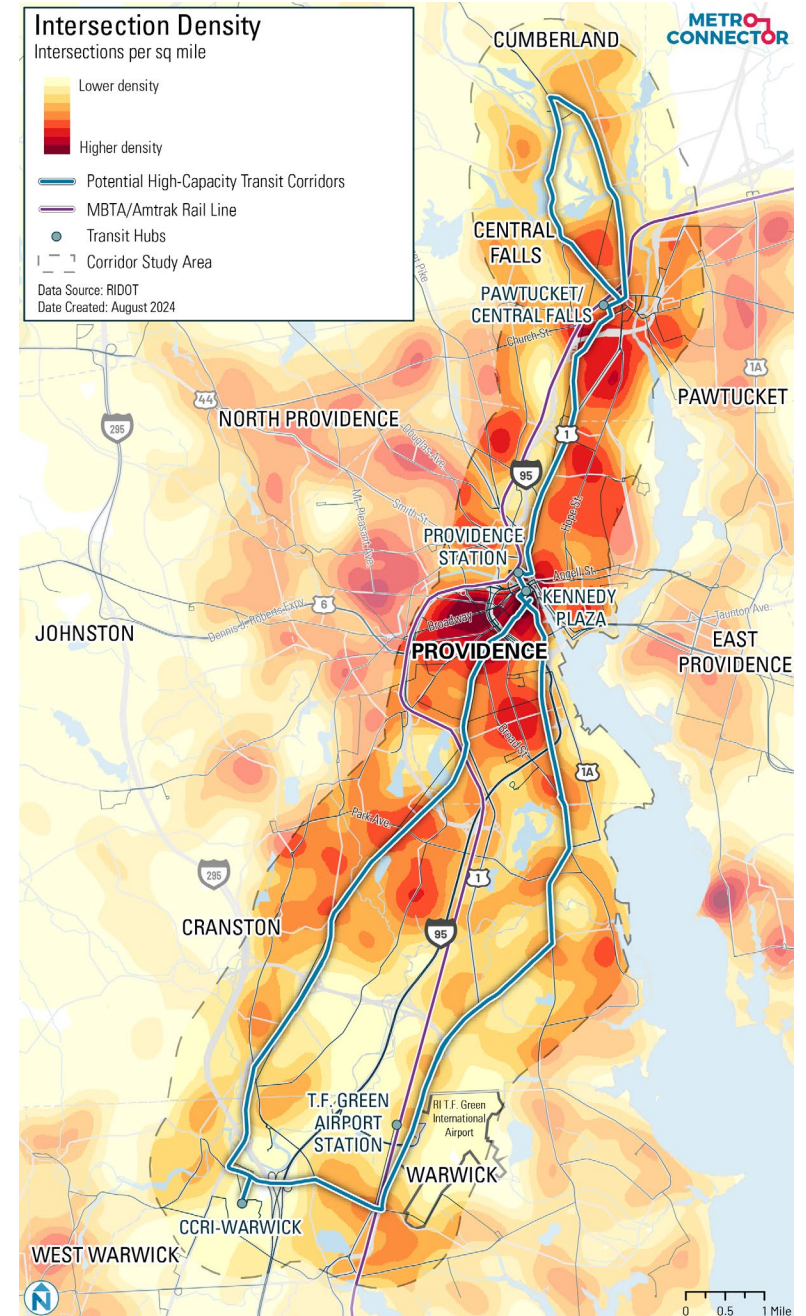
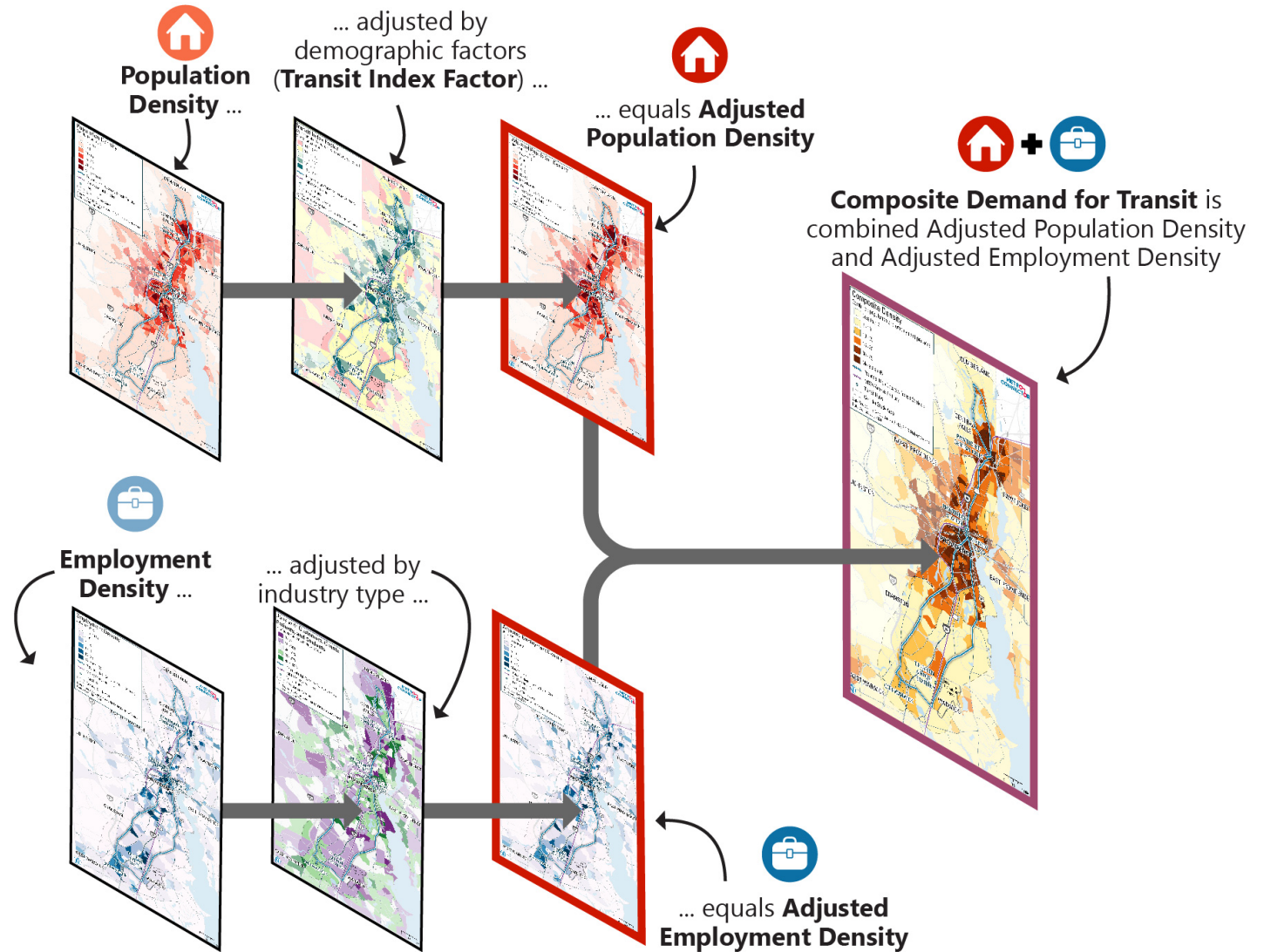


Figure 6-19 Intersection Density

Composite Transit Demand

Composite density is calculated by combining population density adjusted by demographic factors and employment density adjusted by industry type (see customers, clients, patients and students earlier in this document for more information). These four elements account for the vast majority of demand associated with high-capacity transit, and when combined, show how strong that demand is.



Areas shown in orange and darker brown can support higher levels of transit service, while lighter areas can support transit service with lower frequencies. Composite density can broadly indicate demand across contiguous and nearby areas, and demand can accumulate along corridors to produce demand for more frequent service than the densities alone would indicate. Long corridors where most block groups have the density to support 15- to 30-minute service can produce accumulated demand for 15-minute or better service, but areas that do not have at least 10 residents or 5 jobs per acre, or a combination of the two, do not provide an environment where fixed-route transit can succeed easily, and are not appropriate for high-capacity transit.

Places in the study area that can support high levels of transit service include most of Providence, especially Downtown and south, as well as Central Falls and Pawtucket, particularly around the Pawtucket/Central Falls commuter rail station. Demand cumulates along the length of the corridor from Central Falls to the Providence-Cranston border.

- **Cumberland:** The northern region of Valley Falls within the study area has moderate demand and slightly lower demand near the town’s border with Central Falls, but demand throughout the rest of Cumberland is low.
- **Central Falls:** Transit demand is high throughout Central Falls, especially between the two corridors with potential for high-capacity transit.
- **Pawtucket:** Transit demand is highest in Pawtucket around the Pawtucket/Central Falls commuter rail station, with some areas of high demand just east of the Seekonk River.
- **Providence:** Transit demand is high throughout Providence, especially in Downtown Providence, Upper and Lower South Providence, and Federal Hill.
- **Cranston:** Transit demand is highest in Cranston at the municipality’s border with Providence, and demand drops off to the south.
- **Warwick:** Transit demand is also relatively low in Warwick overall and is highest around the airport.

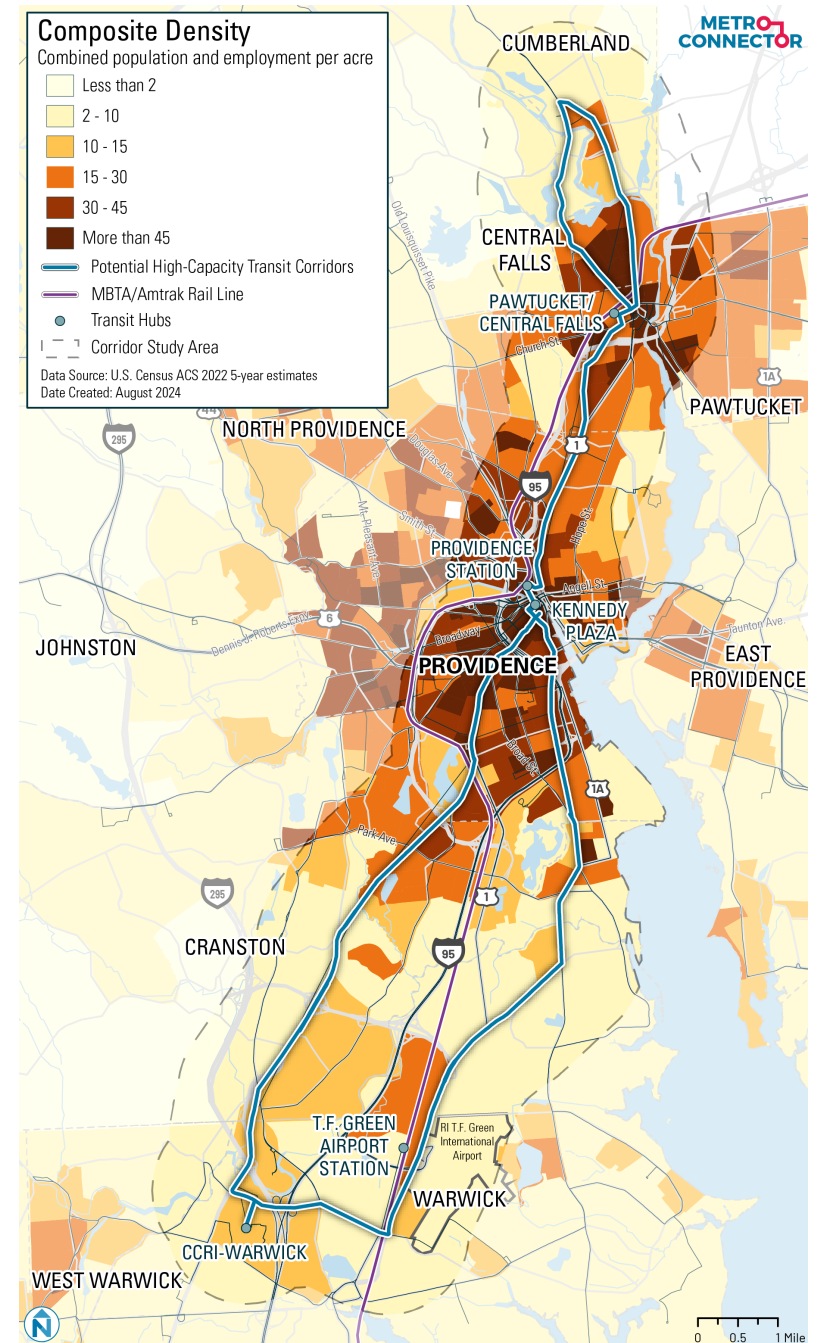


Figure 6-20 Composite Density

Travel Times and Travel Flows

For transit to be effective, it must take people from where they are to where they want to go at the time they want to go. Examining existing travel flows is one way to estimate where the highest demand for travel is, and where direct or relatively easy connections should be made. Travel flows are typically defined as the number of trips between two areas. The more trips made between two areas, the higher travel demand is.

Travel flows within the study area were mapped based on all trips taken between travel flow analysis zones, which are defined by municipal and neighborhood boundaries. The flows with the largest number of average daily trips are highlighted and include all types of trips made by all modes, as well as only those trips made on transit.

Travel Time Markets

Figure 6-21 shows the start time of trips originating in the study area in the years 2019 and 2023. While trip making did decrease significantly during the beginning of the pandemic, by 2023, overall trip making exceeded that of 2019 during many hours of the day, all after 3:00pm. While the traditional morning and afternoon peak periods still occurred in 2023, the percentage of trips happening during the peak periods was lower, and a greater number extending into the evening. This shows the strong demand for frequent, all-day service, well into the evening throughout the study area.

Figure 6-22 compares the start time of trips originating in the study area between a Thursday and a Saturday in 2023. There are many hours of the day where Saturday has a higher number of trips than Thursday. Saturday also has very consistent trip making throughout the day between 10:00am and 7:00pm. This indicates that travel demand on Saturday rivals that of weekday travel, and that rapid transit service should have frequent all-day service on weekends as well as weekdays.

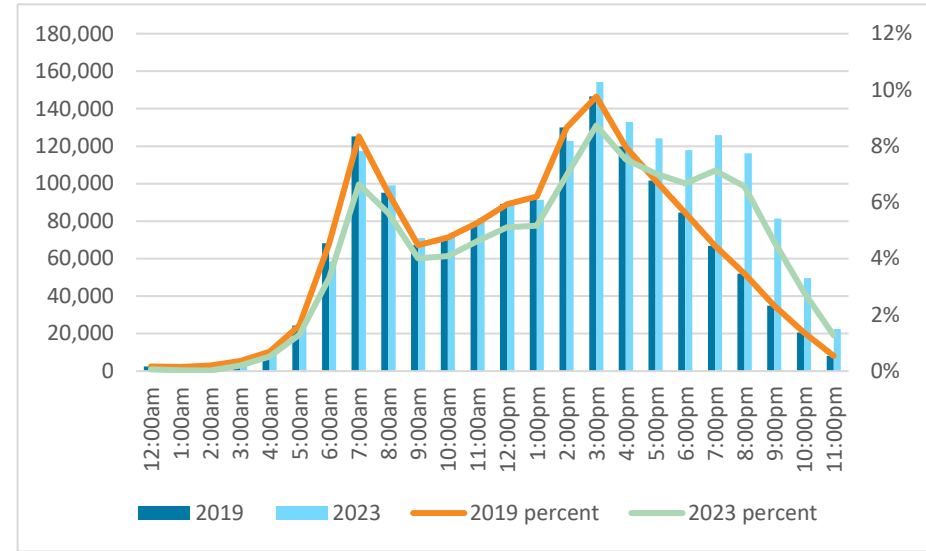


Figure 6-21 Trips Originating in Study Area (Thursdays)

Source: Replica

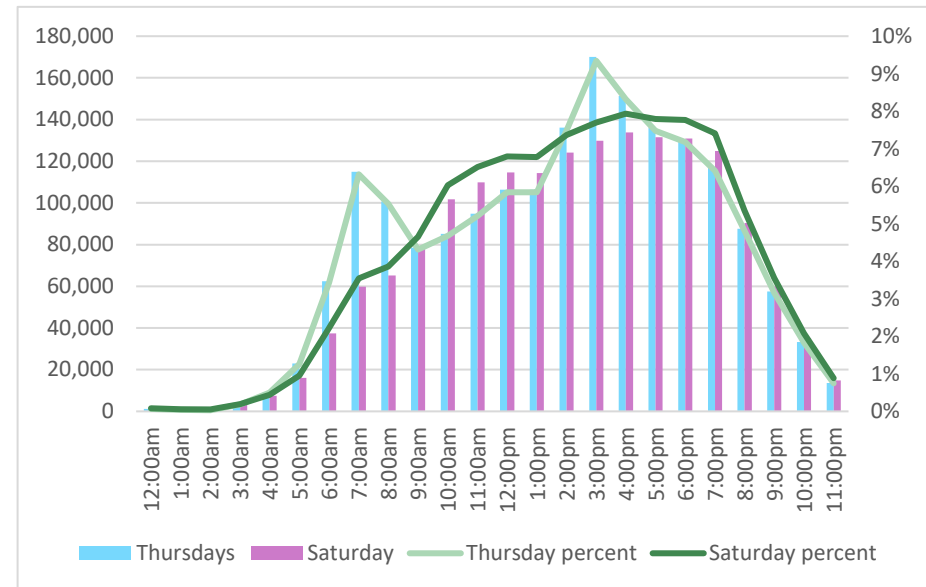


Figure 6-22 Trips Originating in Study Area (2023)

Source: Replica

Weekday All Travel Flows

Figure 6-23 displays travel flows within the study area and shows all types of trips made by all modes, including transit and automobile trips. The biggest flows originate in Pawtucket, Providence, and Cranston. In general, more trips start and end in areas with higher composite demand because there are more origins and destinations in these areas that attract trip making.

- The strongest travel flows in the study area are north-south from Cranston up to Pawtucket. The strongest travel flows that have more than 15,000 trips between the two geographies include:
 - Cranston-Southeast and Cranston-Northeast
 - Cranston-Northeast and Elmwood/West End
 - Elmwood/West End and Charles/Mount Hope/College Hill
 - Downtown Providence and Charles/Mount Hope/College Hill
 - Charles/Mount Hope/College Hill and Pawtucket-West
- Other strong flows that have between 10,000 and 15,000 trips between them include:
 - Warwick-West and Warwick-TF Green
 - Cranston-Northeast and South Elmwood/Washington Park/Edgewood
 - South Elmwood/Washington Park/Edgewood and Elmwood/West End
 - Elmwood/West End and Downtown Providence
 - Pawtucket-West and Central Falls

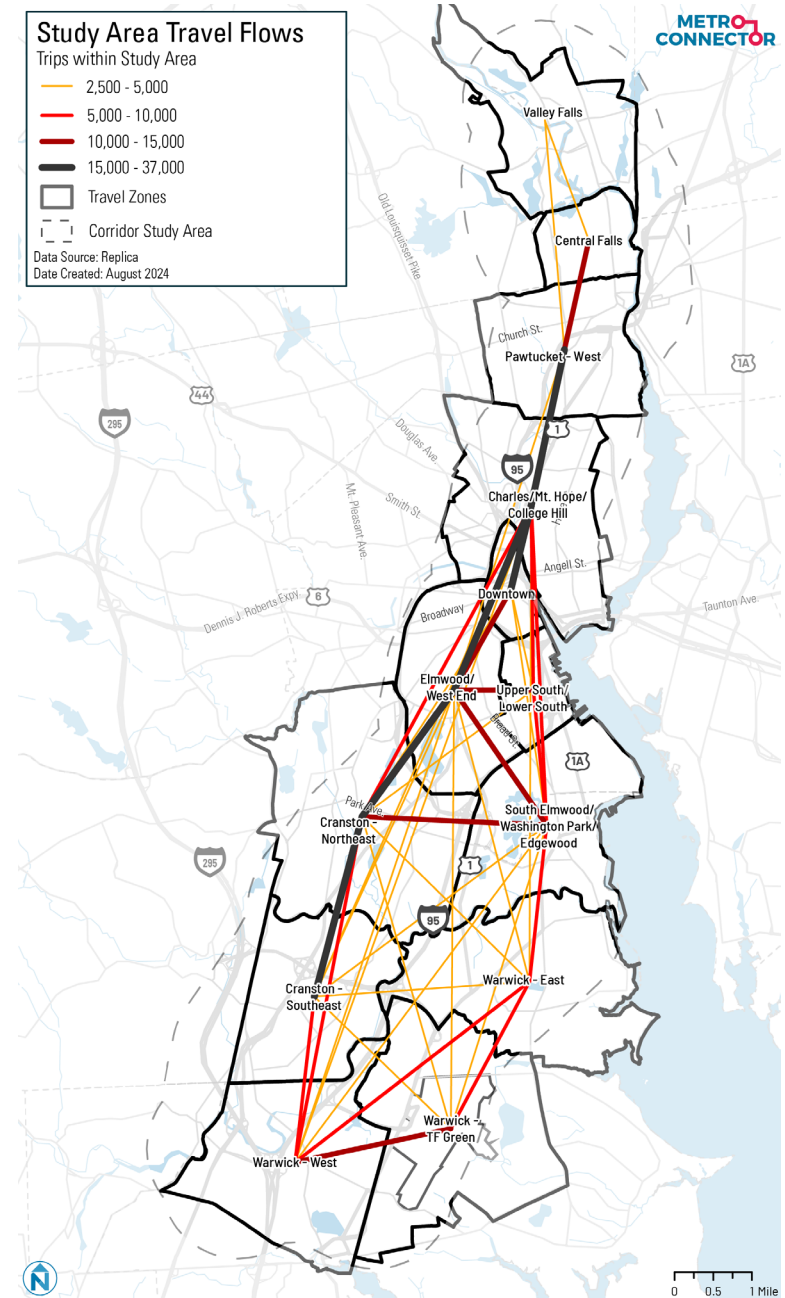


Figure 6-23 All Travel Flows

Weekday Transit Travel Flows

Figure 6-24 shows travel flows within the study area, displaying trips made by transit, including both RIPTA, Amtrak, and MBTA Commuter Rail trips. The RIPTA network is oriented radially around Downtown Providence and as a result, many transit trips within the study area are made to and from this neighborhood. However, there is also a high number of weekday transit trips between Providence and Pawtucket, as well as Pawtucket and Central Falls.

- The strongest transit travel flows in the study area are north-south primarily from neighborhoods in Providence to municipalities in the north, with some east-west flows within Pawtucket. The strongest transit travel flows that have more than 200 trips between the two places include:
 - South Elmwood/Washington Park/Edgewood and Elmwood/West End
 - Elmwood/West End and Downtown Providence
 - Elmwood/West End and Charles/Mount Hope/College Hill
 - Elmwood/West End and Pawtucket-West
 - Charles/Mount Hope/College Hill and Pawtucket-West
 - Pawtucket-West and Central Falls
- Other strong flows that have between 100 and 200 trips between them include:
 - Warwick-TF Green and Elmwood/West End
 - Cranston-Northeast and Elmwood/West End
 - Cranston-Northeast and Downtown Providence
 - South Elmwood/Washington Park/Edgewood and Downtown Providence

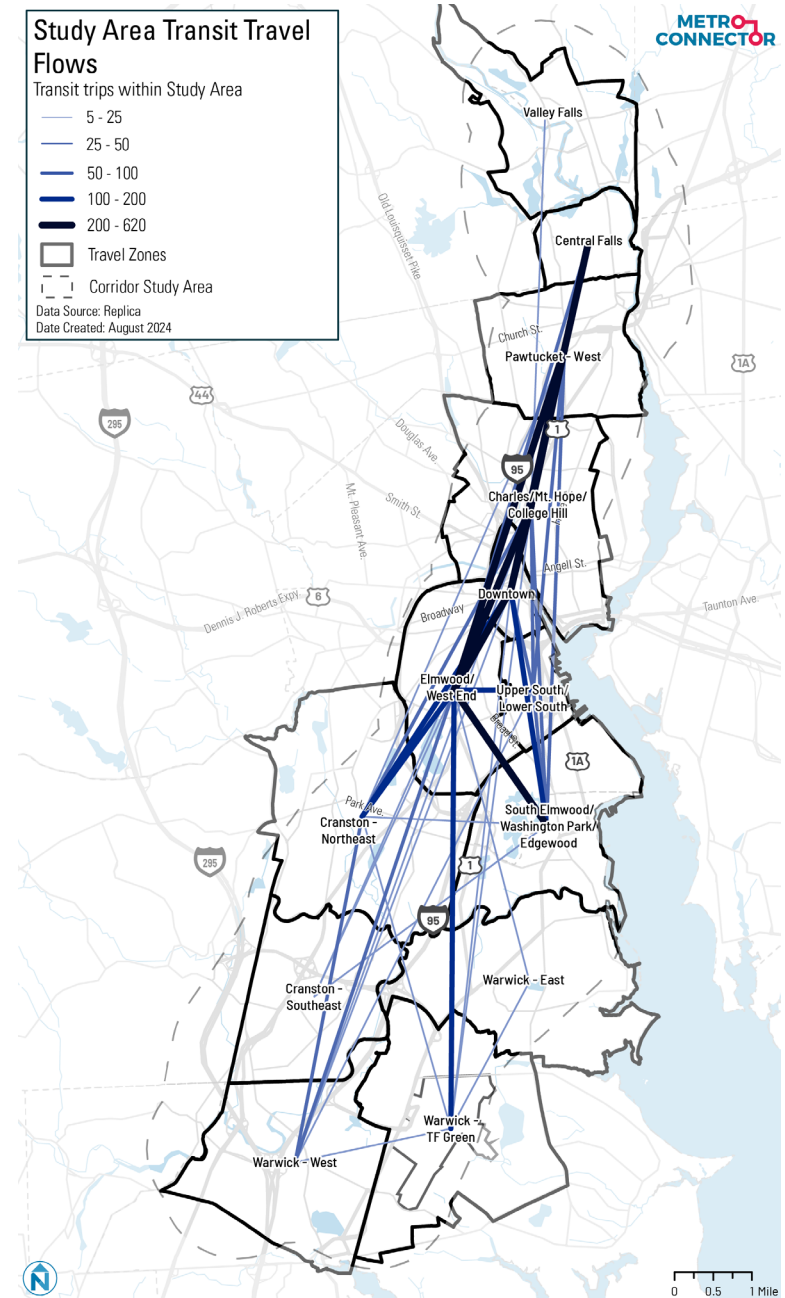


Figure 6-24 Weekday Transit Travel Flows

Equity Travel Flows

Large travel flows between places with high percentages of transit-dependent residents are particularly important to serve with transit. Figure 6-25 shows large travel flows with high percentages of trips made by those in zero-vehicle and low-income households, as well as people of color. The flows have high concentrations of one, two or all of these transit dependent groups.

Most equity travel flows are trips that begin and end in Providence, Pawtucket, and Central Falls, which all have higher proportions of equity populations. These flows are generally between neighboring zones, demonstrating that most travel made by equity groups are local trips within their community to access jobs, services, and social activities.

- The travel flows with higher proportions of equity groups (3 equity groups) are taken between the following areas:
 - Warwick-West and Elmwood/West End
 - Upper South/Lower South Providence and Charles/Mount Hope/College Hill

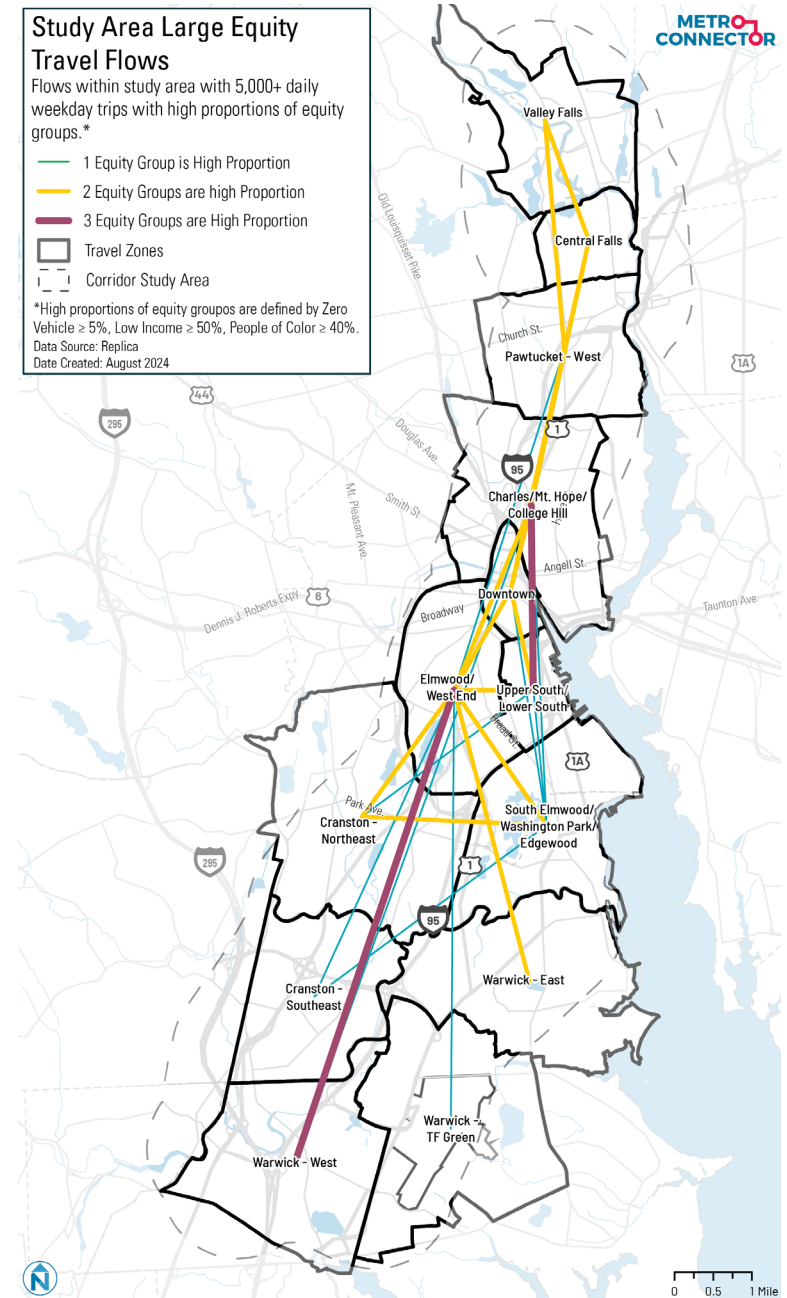


Figure 6-25 Equity Travel Flows

Summary and Opportunities

Rhode Island has transit demand that justifies higher levels of transit service. High-capacity transit would meet the demand for transit in Providence, Central Falls, and throughout the corridor.

- **The population demand is high along the central portions of the study area's key corridors.** Areas that border the study area corridors with lower population density compensate for this with higher employment density or travel activity, such as CCRI-Warwick and T.F. Green International Airport Station.
- **Most of the low-income households in the region are within the study area boundaries.** Some low-income households fall outside the study area boundaries, but other RIPTA services could provide those residents with transit options that could connect them to the high-capacity transit locations.
- **Areas with the highest concentration of non-white residents are located in Downtown Providence and Central Falls.** The potential high-capacity transit corridors would greatly benefit these residents, as the corridors go directly through the high-concentration areas.
- **Zero-vehicle households are most concentrated in downtown Providence, Central Falls and along the northern part of the corridor between the two areas.** Households without access to vehicles are more likely to ride transit, so high-capacity transit corridors are likely to be utilized by these residents.
- **Transit propensity, which is the likelihood to ride transit as compared to the total population, is highest in Downtown Providence, Central Falls, and the area north of Providence Station between Central Falls.** Running high-capacity corridors throughout these areas will provide the residents that are most likely to ride transit with a high-capacity transit option.
- **Travel Flows are strong along the potential high-capacity transit corridors.** Some of the strongest travel flows are between key nodes on the high-capacity transit corridors, many of which have one end in Downtown Providence. From Downtown Providence, trips are made between all areas.
- **High-Capacity Transit could provide many residents that rely on transit a frequent, reliable, and fast way to travel between key destinations,** and would create an opportunity to incorporate more crosstown routes that can connect them to/from their final destinations.
- **Travel demand is high all-day and all-week long in Rhode Island.** Although there are some higher travel times during the peak periods in the morning and evening, travel does not significantly dip during the middle of the day or on the weekend, and it remains steady throughout the day. High-capacity transit can run at high frequencies throughout the day, giving travelers a frequent and reliable way to travel throughout the day and week.
- **High-capacity transit can reduce transportation costs for residents,** which is especially important in areas that have higher transportation costs.
- **High-capacity transit can cause non-transit users to shift modes and take transit.** People that do not currently ride transit may be incentivized to ride high-capacity transit due to it being time-competitive, or even faster, than driving, and being a more economical and safer alternative to auto-commuting. High-capacity transit would also have effects on other RIPTA routes, which could improve the frequency and reliability of connecting routes.