

Appendix C Existing Conditions and Methodology Memo



MEMORANDUM

To: The Metropolitan Council
From: Thomas Wittmann, Nelson\Nygaard
Date: May 20, 2020
Subject: Existing Conditions and Methodology

Multiple transit service providers operate in the Twin Cities metropolitan region, each with different service objectives and definitions of service quality. The purpose of this analysis is to help define how transit resources are currently distributed in the region and understand how the current network balances regional growth goals, existing ridership, social equity, and geographic coverage. This analysis is designed to help identify potential opportunities to improve the current service network and begin to understand what success might look like for the region's transit network.

This memo will summarize the current regional definition of services, the current service productivity by route and route type, and existing service distribution to the region's populations.

FAMILY OF SERVICES (ROUTE CLASSIFICATIONS)

In order to measure how well existing transit service in the region serves the current population and economy, the level of service available should be considered along with transit availability. Routes have different purposes, service times, and frequencies, leading to different levels of service. The Family of Services, or route classifications, considers both service frequency and type of transit. This section looks at how the Met Council currently defines the region's levels of service and proposes a new family of services to help analyze how services fit various potential population groups. Proposed definitions are for the purposes of this analysis only and are not meant to replace or supplement the Met Council's existing definitions.

Existing Service Definitions

In the 2040 Transportation Policy Plan, the Metropolitan Council (Met Council) splits fixed-route transit service for the region's service providers into nine (9) transit route types: light rail, commuter rail, arterial bus rapid transit, highway bus rapid transit, dedicated bus rapid transit, commuter and express bus, core local bus, supporting local bus, and suburban local bus. These categories are based on each route's regional context and role within the overall network.

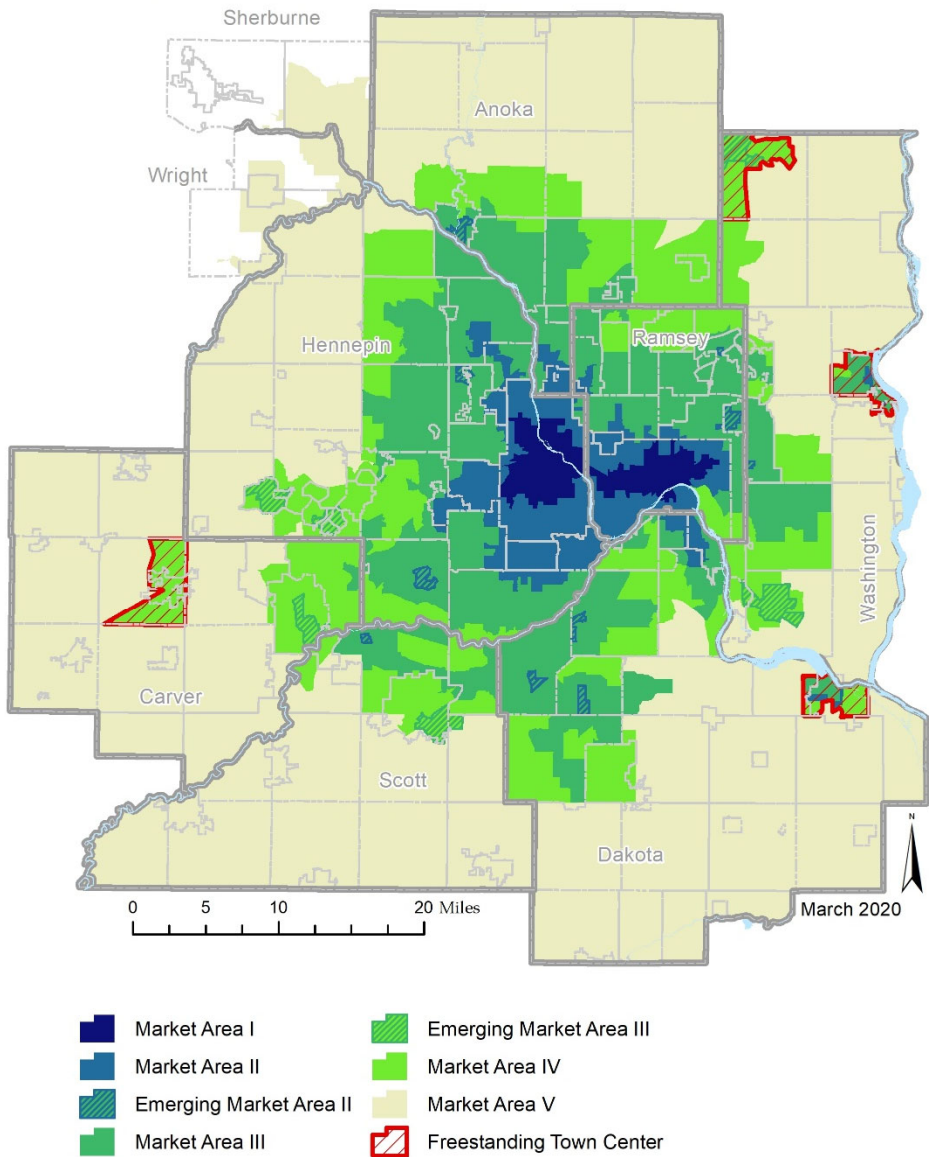
Transit Market Areas

To account for differences in the planning and evaluation of transit service, the Met Council divided the region into five distinct Transit Market Areas representing different levels of potential transit demand in its 2040 Transportation Policy Plan. A map of the Transit Market Areas can be seen in Figure **Error! No text of specified style in document.**-1. The differences between Transit Market Areas are related to population, employment, automobile availability, and block size and urban form. For example, Transit Market Area I has the highest densities, includes Urban Center communities, has a gridded street network, and has high potential transit ridership necessary to support intensive fixed-route transit service. Transit Market Area V has low

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densities, is made up of mostly rural land uses, and only has enough potential ridership to support demand-response services. Transit Market Areas are a gross tool used to guide transit planning decisions. They help ensure that the types and levels of transit service provided, particularly fixed-route bus service, match the expected demand in each area. These Transit Market Areas are used to in the route type definitions below.

Figure Error! No text of specified style in document.-1 Transit Market Areas



Source: The Met Council, 2040 Transportation Policy Plan, Appendix G: Regional Transit Design Guidelines and Performance Standards

Existing Met Council Defined Fixed-Route Transit Types

Light Rail

Light rail operates using electrically powered passenger rail cars operating on fixed rails in dedicated right-of-way. It provides frequent, all-day service stopping at stations with high levels of customer amenities and waiting facilities. Design guidelines for light rail can be found in the Regional Transitway Guidelines.

Commuter Rail

Commuter rail operates using diesel-power locomotives and passenger coaches on traditional railroad track. These trains typically only operate during the morning and evening peak period to serve work commuters. Design guidelines for commuter rail can be found in the Regional Transitway Guidelines.

Bus Rapid Transit (BRT)

The Met Council's 2040 Transportation Policy Plan includes 3 separate route classifications for bus rapid transit service. For the purposes of this analysis, we have grouped the three classifications into one unifying route type, bus rapid transit (BRT).

Arterial Bus Rapid Transit

Arterial bus rapid transit (BRT) lines operate in high demand urban arterial corridors with service, facility, and technology improvements that enable faster travel speeds, greater frequency, an improved passenger experience, and better reliability. Design guidelines for arterial BRT can be found in the Regional Transitway Guidelines.

Highway Bus Rapid Transit

Highway bus rapid transit (BRT) lines operate in high demand highway corridors with service, facility, and technology improvements providing faster travel speeds, all-day service, greater frequency, an improved passenger experience, and better reliability. Design guidelines for highway BRT can be found in the Regional Transitway Guidelines.

Dedicated Bus Rapid Transit

Dedicated bus rapid transit (BRT) lines operate in dedicated right-of-way for the exclusive use of buses in high demand corridors. Service, facility and technology improvements are similar to light rail. It provides faster travel speeds, all-day service, greater frequency, an improved passenger experience, and better reliability. Design guidelines for dedicated BRT have not yet been developed. The Regional Transitway Guidelines will be updated to address dedicated BRT when the appropriate data and best practices are available

Commuter and Express Bus

Commuter and express bus routes primarily operate during peak periods to serve commuters to downtown or a major employment center. These routes typically operate non-stop on highways for portions of the route between picking up passengers in residential areas or at park-and-ride facilities and dropping them off at a major destination.

Core Local

Bus core local routes typically serve the denser urban areas of Market Areas I and II, usually providing access to a downtown or major activity center along important commercial corridors. They form the base of the core bus network and are typically some of the most productive routes in the system. Some core local bus routes are supplemented with a limited stop route designed to serve customers wishing to travel farther distances along the corridor. Limited stop routes make fewer stops and provide faster service than the core local routes.

Supporting Local Bus

Supporting local routes are typically designed to provide crosstown connections within Market Areas I and II. Typically, these routes do not serve a downtown but play an important role connecting to core local routes and ensuring transit access for those not traveling downtown.

Suburban Local Bus

Suburban local routes typically operate in Market Areas II and III in a suburban context and are often less productive than core local routes. These routes serve an important role in providing a basic level of transit coverage throughout the region. Provider-specific variations on suburban local bus include community routes and feeder routes.

Proposed Fixed-Route Family of Services

To quantify the approximate quality of service different population, employment, and socioeconomic groups were receiving in the planning area, a revised family of services was used for this study. The purpose of this route classification is not to supplant the Met Council's definitions, but to allow for a common understanding of how much of the region is served by very high-quality service all the way to no transit service. The four (4) new service level classifications look primarily at the frequency of service for the purpose of measuring existing service distribution.

High-Frequency Transit

High-frequency transit provides riders with 15-minute or better frequencies throughout most of the day on weekdays and Saturdays. High-frequency service every 15-minutes or better is convenient enough for users to ride without depending on a schedule. Moreover, all-day high-frequency service caters to all trip types, including work, shopping, medical, and social trips, and facilitates mobility without the need for a car. The transit corridor segments in this category match those identified in Metro Transit's High Frequency Service Network, but also include light rail routes and bus rapid transit (BRT), including the Red Line, which does not operate as frequently.

Local Service

Local service provides riders with 30-minute or better frequencies throughout the day on weekdays. While service every 30-minutes does require a schedule, it is convenient enough to support most trips types, albeit with less flexibility. Market research has consistently shown that 30-minute service is the minimum frequency needed to attract discretionary trips. This service level includes many existing Core Local and Supporting Local bus routes.

Basic Service

Basic service includes corridors and flex services with more than 30-minute frequencies throughout the day. Basic services are designed for areas where there is a basic need for transportation, but demand levels are not high. These services serve generally as a means of transportation in automobile-oriented environments for those that are unable to or choose not to travel via private automobile. Frequencies are not conducive to convenient trip-making. This service level corresponds with many of the Suburban Local bus routes, which provide a basic level of transit coverage.

Commuter & Express Service

Commuter and express type services are designed to address longer-distance trips, and typically operate non-stop over longer distances to offer competitive travel times. Commuter and express services encompass 1) peak-only service into the two central business districts, 2) reverse commute service that targets suburban employers, and 3) all-day service with long-non-stop segments. Commuter and express trips may have a different fare structure.

Service Types Not Included in This Analysis

The analysis presented in this report only accounts for fixed-route service. Multiple service providers throughout the region operate on-demand type services for the general public, including dial-a-ride, vanpool, microtransit, and flex services. These on-demand type services provide mobility to people in areas and between origin-destination pairs that do not have sufficient demand to support fixed-route transit, as well as first/last mile service. Definitions for the below services have been adapted from a recent update of the 2040 Transportation Policy Plan¹.

Dial-A-Ride

Dial-a-ride service provides a public transit option for travel that is not served by the regular-route transit network. There are two types of dial-a-ride service in the region: general public dial-a-ride and Metro Mobility paratransit service mandated by state and federal law. The Met Council contracts with local governments and private companies to provide county-based general public dial-a-ride service, known as Transit Link. Although Transit Link is available to the general public, typical users are the elderly, people who do not own a car, people too young to drive, and persons with disabilities traveling outside the Metro Mobility service area. Some suburban transit providers also provide citywide dial-a-ride services with non-regional funds in place of regular-route service that would not be effective.

Vanpool

Commuter vanpools are made up of five or more people, including a volunteer driver, commuting to and from work at destinations throughout the region on a regular basis. The Metro Vanpool program provides financial assistance for vans serving locations or times not well served by the regular-route transit network.

¹ Thrive MSP 2040: Transportation Policy Plan, Chapter 6: Transit Investment Direction and Plan, <https://metrocouncil.org/Council-Meetings/Committees/Transportation-Advisory-Board-TAB/TAB-Technical-Advisory-Committee/TAC-Planning-Committee/2020/TAC-Planning-4-09-20/Chapter-6.aspx>

Emerging Shared Mobility Technology

Recent advances in shared mobility technology provide new alternatives and complements to the regular route transit network. Shared mobility services such as ridesharing services and microtransit have been defined by their ability to leverage smart phone technology (though they are not needed to access service), providing on-demand service, and being dynamically routed to efficiently serve demand in real time. On-demand shared mobility services have the potential to more effectively serve low-density, auto-oriented areas that have proven difficult to serve with fixed-route service. Examples from regional transit providers include SouthWest Transit's SouthWest Prime, Plymouth Metrolink Dial-a-Ride, Maple Grove My Ride, and MVTA Connect.

HIGH-LEVEL ASSESSMENT OF EXISTING SERVICE

One of the first steps in identifying potential opportunities to improve the current service network is to understand how existing services are operating, who is currently riding transit, and how the existing network matches the potential socioeconomic and density service characteristics. This section provides a high-level overview of the level of passengers being carried by existing services, existing service allocation by service type and by day of week, and how well the existing network serves jobs, residential markets, and potential higher-need socioeconomic groups.

Ridership Production (Service Productivity)

Productivity looks at how efficient transit service is at serving the most rides, often measured as boardings per hour or boardings per trip. Currently, the Met Council measures productivity with the number of passengers per in-service hour. In the 2040 Transportation Policy Plan, the Met Council sets minimum productivity thresholds by route type, as well as a minimum boardings per service hour per trip. (Figure 2).

This analysis documented the current service productivity by segment for Metro Transit routes² and by route for non-Metro Transit and Commuter and Express routes. For high frequency, local, and basic routes, productivity was measured using the Met Council measure of boardings per in-service hour. For commuter and express routes, productivity was measured using boardings per trip, in order to look at how the route performs on a trip level. This is consistent with national best practices.

Figure 3 and Figure 4 show 2018 service productivity throughout the region for all day service and commuter & express service, respectively. The most productive (more than 60 boardings per in-service hour) all day transit corridors are centered in downtown Minneapolis and along arterial corridors to the north and south of the city, as well as some corridors in St. Paul. In general, all-day service segments are more productive the closer one is to the St. Paul and Minneapolis urban centers, which is consistent with the definitions and expectations developed for the Met Council's five market areas. For commuter and express routes, the majority of routes carry over 20 boardings per trip.

² Productivity for Metro Transit routes is not measured on a route level. Metro Transit has calculated the productivity of over 900 different route segments, which allows for a more refined assessment of where productivity levels vary. It also allows for seeing productivity on route branches.

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Figure 2 Passengers per In-Service Hour

Route Type	Route Average*	Minimum per Trip**
Core Local Bus	≥ 20	≥ 15
Supporting Local Bus	≥ 15	≥ 10
Suburban Local Bus	≥ 10	≥ 5
Arterial BRT	≥ 25	≥ 5
Highway BRT	≥ 25	≥ 5
Light Rail	≥ 70	≥ 50
Commuter Express Bus	Peak ≥ 20; Off-peak ≥ 10	Peak ≥ 15; Off-peak ≥ 5
Commuter Rail	≥ 70	≥ 50
General Public Dial-a-Ride	≥ 2	N/A

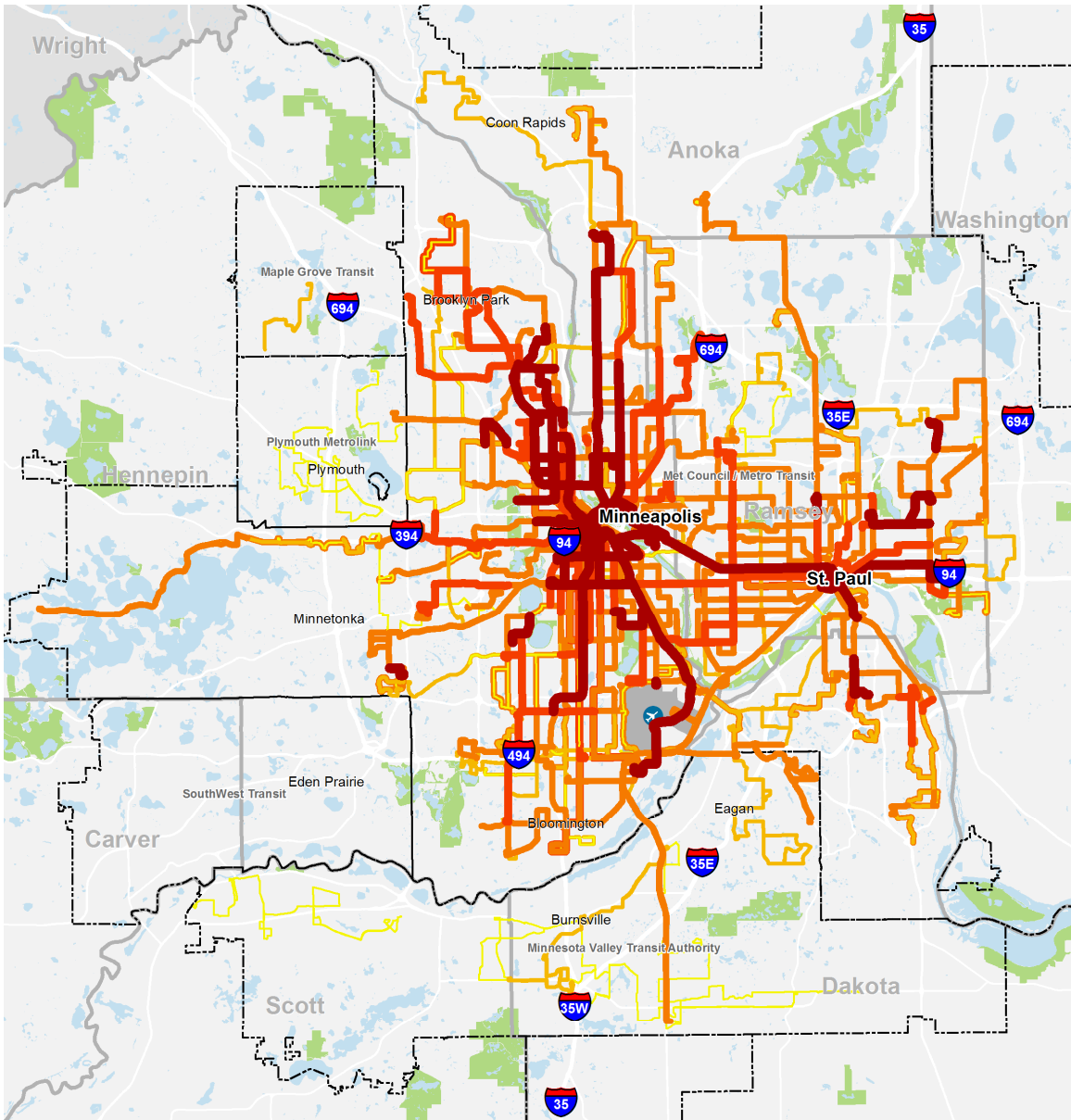
* Route average represents the average passengers per in service hour over the entire day. Individual hours may fall below standard.

** Minimum per trip represents the minimum passengers per in service hour for individual trips on a route. Multivehicle trips, such as three-car trains, will be treated as a single trip.

Source: The Met Council, 2040 Transportation Policy Plan, Appendix G: Transit Design Guidelines

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Figure 3 Productivity for High Frequency Transit (HFT), Local, and Basic Service



Productivity by Segment for High Frequency Transit, Local, and Basic Transit Service

Boardings per In Service Hour

- 10 or Less
- 11 - 20
- 21 - 40
- 41 - 60
- More than 60

- Transit Authority Service Areas
- County Boundary

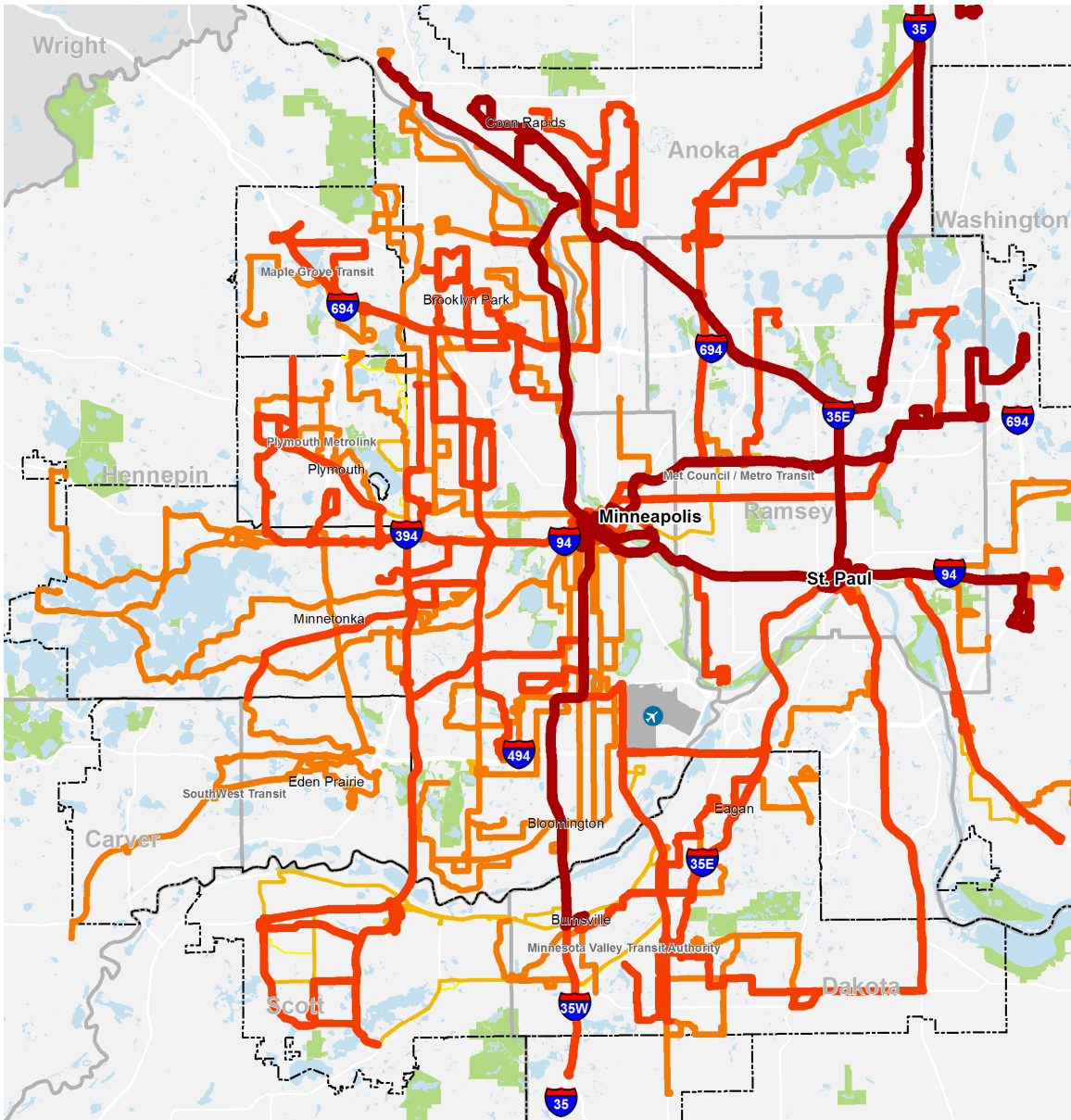
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Source: 2018 Segment- and Route-Level Ridership and Operations Data, The Met Council

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Figure 4 Commuter and Express Service Productivity



Productivity by Route for Commuter & Express Transit

Boardings per Trip

- 10 or Less
- 11 - 20
- 21 - 40
- 41 - 60
- More than 60

- Transit Authority Service Areas
- County Boundary

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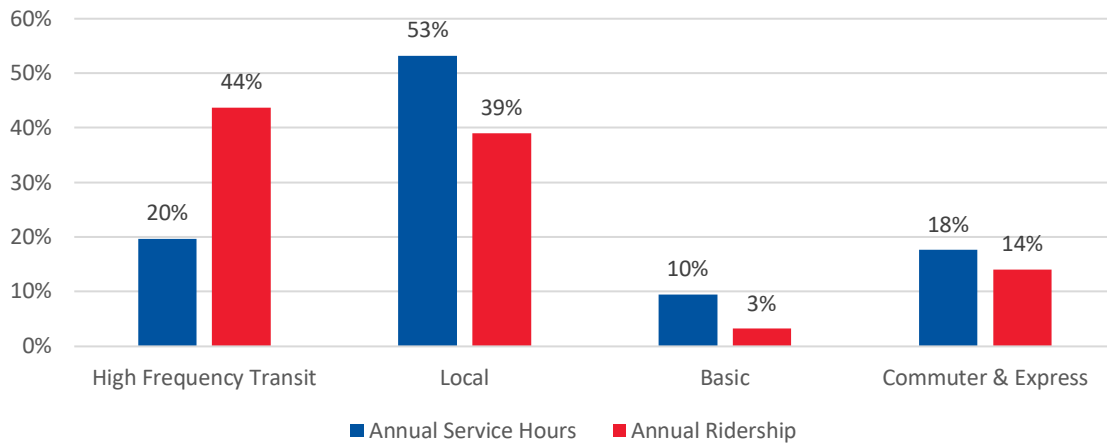
Source: 2018 Segment- and Route-Level Ridership and Operations Data, The Met Council

Existing Resource Allocation

This section looks at regional service priorities by analyzing how resources are currently allocated across the transit network. Figure 5 shows how service hours are distributed across the analysis service types, as well as the corresponding ridership. Over half of all service hours are dedicated to local transit routes, which generates about 40% of all regional transit riders. Meanwhile, 20% of operating resources are spent on the high frequency transit network, which results in 44% of ridership. On the other hand, 10% of resources are spent on basic bus service, which generates only 3% of the region’s ridership.

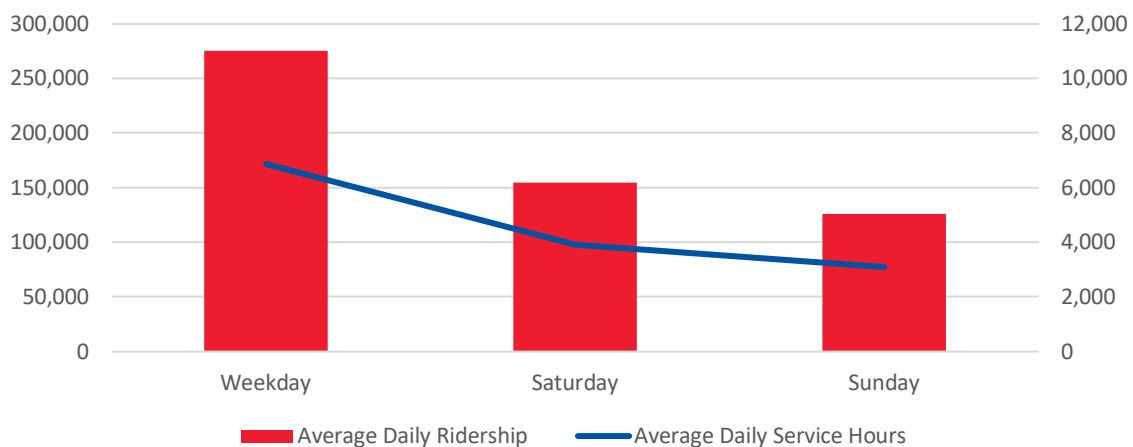
Figure 6 shows how region-wide service hours are allocated across weekdays, Saturdays, and Sundays and the resulting service performance. Saturday ridership is 44% less than weekday ridership, while the number of hours operated are 43% less. On Sundays, 55% fewer hours are operated, and ridership is 64% less than on weekdays. Productivity for all day types is about equal at 40 boardings per service hour.

Figure 5 Annual Service Hours and Ridership by Proposed Family of Services



Source: 2018 Route-Level Ridership and Operations Data, The Met Council

Figure 6 Average Daily Service Hours and Ridership by Day Type



Source: 2018 Route-Level Ridership and Operations Data, The Met Council

Who is Riding Transit?

An analysis of who is currently riding transit in the Twin Cities region provides insight into how well the transit agencies are serving the region’s residents. To do this, rider profiles were developed for high capacity transit riders (light rail and BRT routes), local transit riders (core local, supporting local, and suburban local) and commuter & express riders (commuter and express bus and commuter rail). The data points and charts in this section were pulled from a 2016 On-Board Survey done by the Met Council as part of their Travel Behavior Inventory (TBI)³.

Figure 7 On-Board Survey Rider Profile Comparison by Service Type

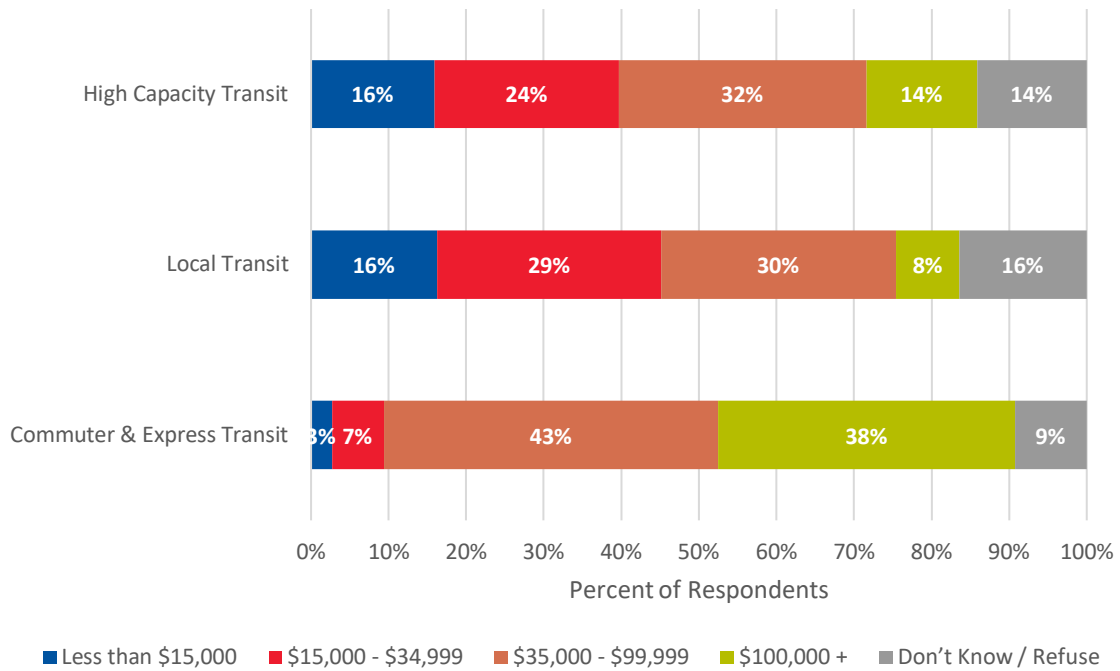
Data	High Capacity Transit Users	Local Transit Users	Commuter & Express Transit Users
Income (Figure 8)	About 40% of high capacity transit riders earned less than \$35,000.	About 50% of local riders earn less than \$35,000 per year Error! Reference source not found..	Nearly 40% of Commuter & Express riders earn more than \$100,000 per year Error! Reference source not found..
Race/Ethnicity (Figure 9)	More than half (57%) of the riders were White and one-quarter were African American Error! Reference source not found..	Half of all local riders are non-white. Nearly one-third are Black/African American Error! Reference source not found..	A large majority (78%) of Commuter & Express riders are White Error! Reference source not found..
Access to a Vehicle (Figure 10)	Majority of the riders (66%) have access to a vehicle that they could have used for their transit trip.	About 50% of local riders have access to a vehicle that they could have used for their transit trip Error! Reference source not found..	An overwhelming majority (87%) of the riders have access to a vehicle that they could have used for their transit trip Error! Reference source not found..
Trip Purpose (Figure 11)	Less than half (45%) of riders were making a trip to or from work. Other top trip purposes include social and personal trips (16%), as well as trips to or from school (13%) Error! Reference source not found..	45% of riders were taking a trip to or from work. Social, personal, and school trips were also common trip purposes Error! Reference source not found..	About 90% of Commuter & Express riders were traveling for work or school (6%) Error! Reference source not found..

Source: 2016 On-Board Survey, The Met Council

³ Travel Behavior Inventory On-Board Survey 2016, <https://metrotransitm.shinyapps.io/TravelBehaviorInventory/>

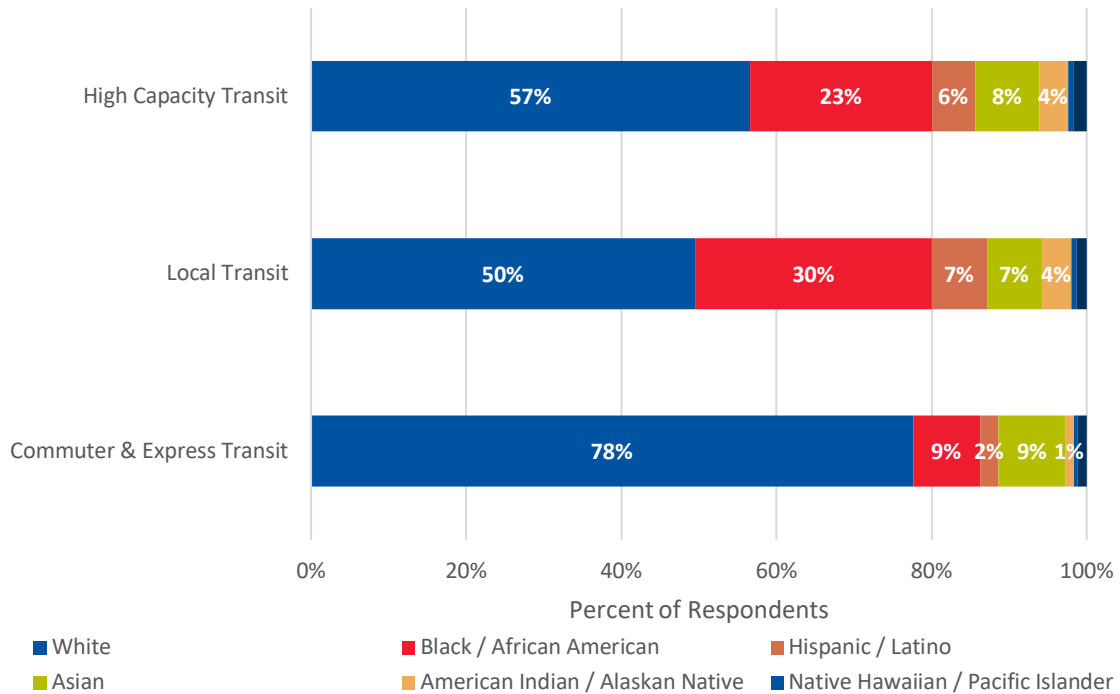
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Figure 8 On-Board Survey Rider Income by Service Type



Source: 2016 On-Board Survey, The Met Council

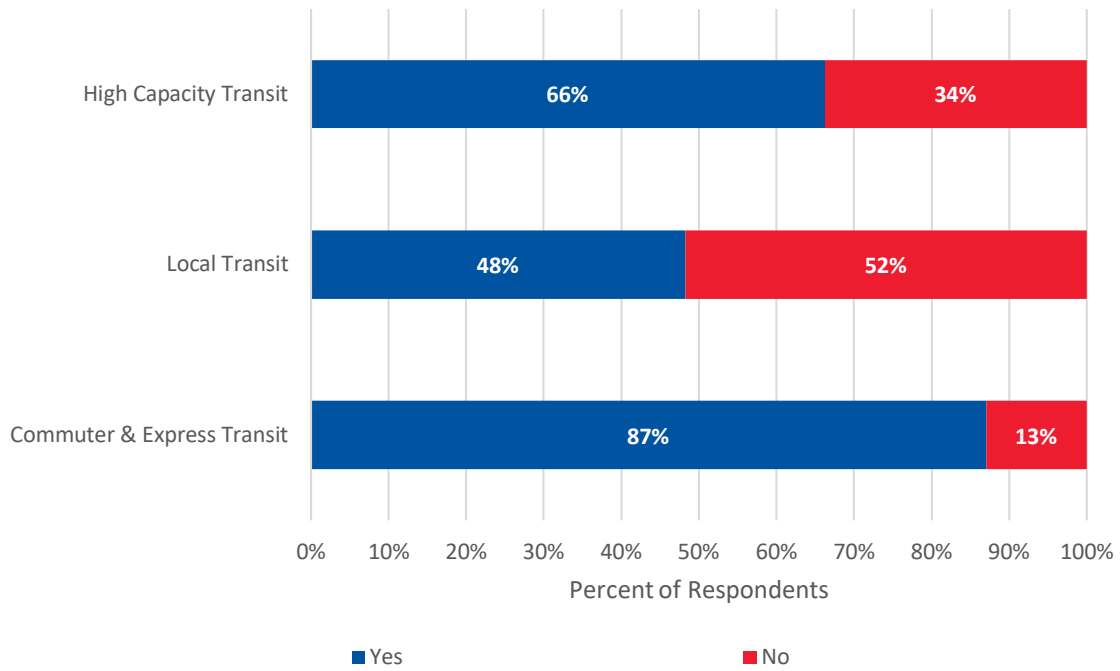
Figure 9 On-Board Survey Rider Race/Ethnicity by Service Type



Source: 2016 On-Board Survey, The Met Council

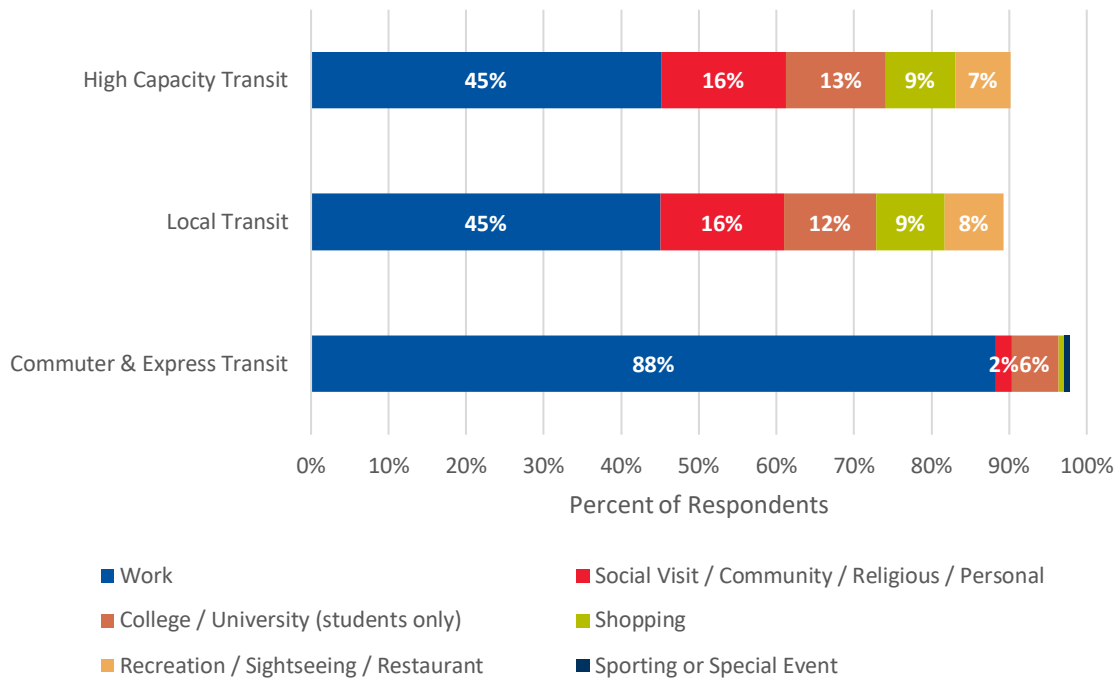
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Figure 10 On Board Survey Rider Vehicle Availability by Service Type



Source: 2016 On-Board Survey, The Met Council

Figure 11 On-Board Survey Trip Purpose by Service Type



Source: 2016 On-Board Survey, The Met Council

Existing Service Distribution

This section examines how the region's current service network serves various portions of the travel market and begins to identify areas of opportunity for potential service expansion. Areas of opportunity are areas that may show a higher propensity for supporting transit use based on measurable demographic or density characteristics. It should be noted that the results of the service distribution analysis do not implicitly suggest that there is a sustainable market for transit in any given area. Any results should be considered in context of other demand estimating tools. An area that has higher concentrations of a potential higher need population may have land use characteristics or a road network that is unsuited for cost-effective service provision.

Methodology

For this analysis, the proportion of regional population and employment served by the current transit network was measured across a variety of socioeconomic and demographic variables. Overall population and employment were considered, along with disadvantaged and transportation marginalized population groups.

Specific population and employment groups included in this analysis include:

1. **Combined population and employment**
2. **Total population**
3. **Total employment**
4. **Low-income population** (individuals with an individual or family income below 185% of the federal poverty threshold)
5. **Low-income population within Areas of Concentrated Poverty (ACPs)** (census tracts where 40% or more of the residents have family or individual incomes that are less than 185% of the federal poverty threshold⁴)
6. **Non-white population** (non-white or Hispanic population)
7. **Low vehicle-access population** (individuals aged 16 or older without access to an automobile)
8. **Senior population** (individuals aged 65 or older)
9. **Low-wage employment** (jobs earning less than \$40,000 per year)

Census tract data was pulled from data provided by the Met Council, the 2017 American Community Survey (ACS) 5-Year Estimates, and Longitudinal Employer-Household Dynamics (LEHD).

Access to transit for each population and employment variable was measured using a 10-minute (800m) walkshed from each bus/rail stop⁵. Walksheds were created for each level of service from the proposed family of services: high frequency transit, local transit, basic transit, and commuter

⁴ Metropolitan Council, Areas of Concentrated Poverty, 2017. <https://gisdata.mn.gov/dataset/us-mn-state-metc-society-areas-of-concntrtd-pvrtv>

⁵ While park-and-rides provide expanded access to transit for those with access to an automobile, drivesheds for park-and-rides were not calculated for this analysis. This study focuses on service distribution to transportation marginalized populations; therefore, population and jobs within walking distance of transit were used as the measure.

& express transit. Each walkshed is cumulative based on the minimum level of service a resident or employee has access to. For example, if an individual has access to the high frequency transit network, they were also included as having access to the local, basic, and commuter and express networks. Each walkshed was intersected with the regional census tract boundaries to determine the proportion of the population that was within a reasonable walking distance of each level of service. For the purposes of this analysis, the population of each census tract was assumed to be evenly distributed throughout the area of the census tract. Water bodies were excluded from the area calculation of the census tracts. The proportion of area within the walkshed was applied to the total of population or employment variable to calculate the proportion served. The census tracts were then divided into their respective Transit Market Areas (TMAs). The population and employment groups that have access to the various service levels within each market area were summed in order to determine the percentage of the groups that are served by the four service levels and what percentage are not served by any transit.

Geographic Distribution Results

The proportion of the population and employment groups served by each of the four route types within each market is shown in this section. Overall, the existing transit network covers the large majority of Market Areas 1 and 2. In Market Area 1, about 95% of the population and employment groups are covered by at least local, 30-minute weekday service. In Market Area 2, about 85% of all population and employment groups are served by local transit service. In the more suburban areas of the region (Market Areas 3, 4, and 5), because only stop walksheds were calculated, it can be assumed that a greater proportion of residents and jobs would have access to commuter and express transit if drivesheds from park-and-rides had been used.

For each socioeconomic group, this analysis shows the geographic distribution of the areas of opportunity within the region. Four maps are included for each of the population and employment groups⁶, showing: the densest areas within the region, the areas not served by high-frequency transit, the areas not served by local transit, the areas not served by basic transit.

Employment and Population Density

For fixed-route transit to be the most productive, it must be direct, frequent, easy to access, reliable, and available when people need it. More than any other factors, population, and employment density determines whether this is possible. Transit needs to serve sufficiently high volumes of travelers to be cost-effective, and the density of development in an area determines the overall size of the travel market. The reach of transit is generally limited to within one-quarter to one-half mile of the transit line or station; therefore, the size of the travel market is directly related to the density of development in that area. Transit service frequencies are closely related to market size. Bigger markets support more frequent service, while smaller markets support less frequent service. To attract travelers who have other options, such as automobiles, transit must be relatively frequent—at least every 30 minutes. Below that, transit can be expected to serve only those who do not or cannot drive. Suggested transit service frequency in relation to population and employment densities is shown in Figure 12 and Figure 13⁷.

⁶ Maps were not created to exclusively show the distribution of population density throughout the region, but instead the data is presented along with employment density in Figure 13.

⁷ Suggested transit frequencies may not account for every single major employment node in a large block group. They should be used as guidelines.

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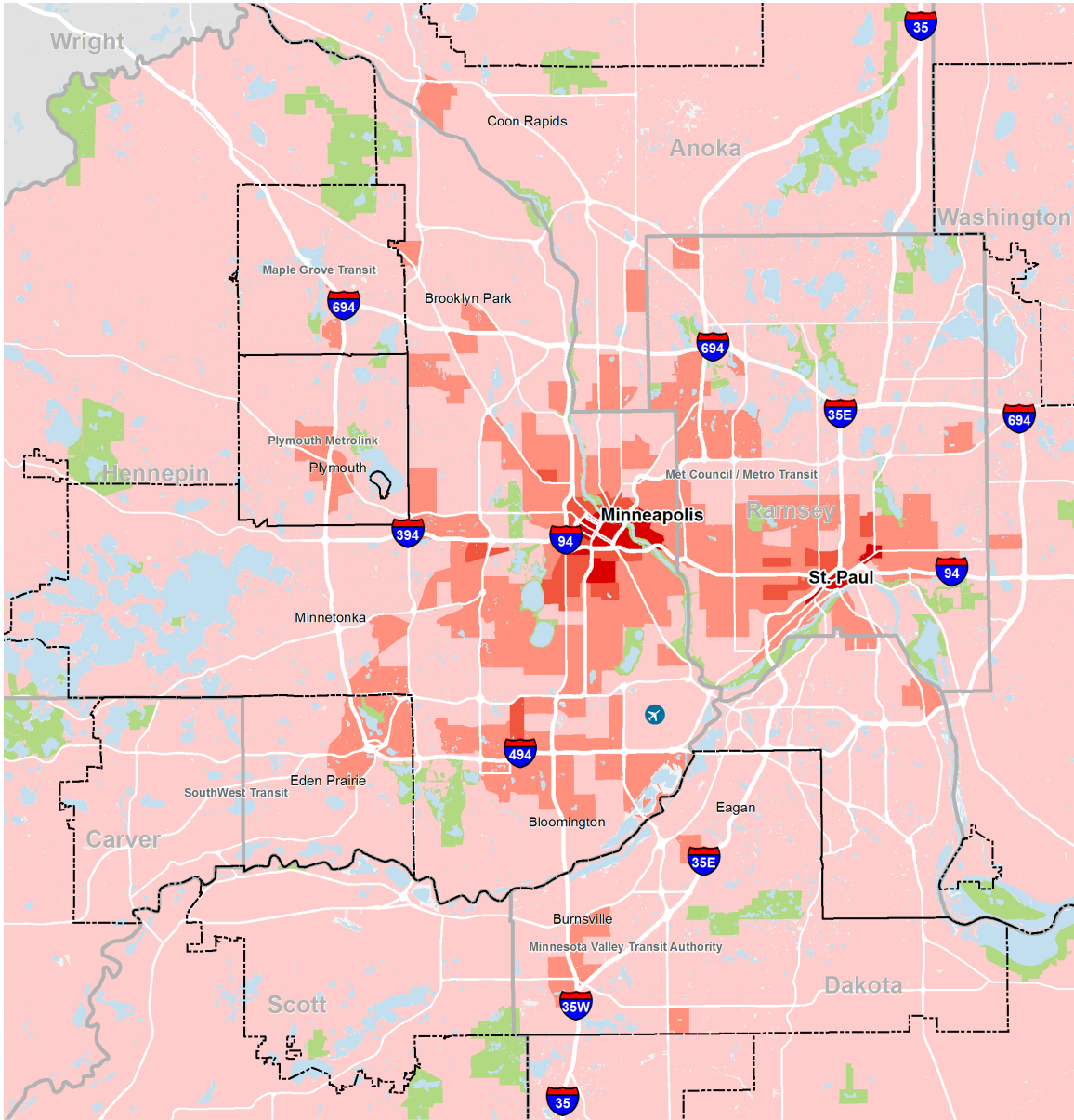
Figure 12 Land Use and Transit Demand



Source: Thresholds are based on research by Nelson\Nygaard.

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Figure 13 Population and Employment Density



Population and Employment Density

Residents and jobs per acre (service frequency supported)

- Less than 10 (flexible and demand response services)
- 10 - 25 (service every 30 - 60 minutes)
- 25 - 45 (service every 15 - 30 minutes)
- More than 45 (service every 15 minutes or better)

- Transit Authority Service Areas
- County Boundary

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Source: The Met Council, 2018 ACS 5-year estimates, 2017 LEHD

Total Population

One of the primary drivers of demand for transit service is the population base of an area. The population density of a place can indicate what kind of transit service may be appropriate and how frequently it should operate; an area with higher population density can support more frequent transit service.

Geographic Coverage

A large majority of the total population in both Market Areas 1 and 2 have access to 30-minute transit service or better. In Market Area 1, two-thirds of the area’s population have access to high frequency transit and just short of 100% have access to local service. The population in Market Area 2 has less access to high frequency transit, but over three-quarters can reach local service. In areas of the region where there is less population density, just over 40% of the population in Market Area 3 and about 15% in Market Area 4 have access to at least basic transit services. Market Area 4’s population densities are too low to support all day transit service but can support commuter and express services to the region’s largest employment centers.

Areas of Opportunity

Figure 13 details the overall combined population and employment densities. It shows that the highest density areas, where ridership potential is the highest, are in Market Areas 1 and 2, which have excellent coverage by high frequency transit and service every 30-minutes or better.

Figure 14 Total Population Served by Transit Service Level and Market Area

Service Level	Market Area 1	Market Area 2	Market Area 3	Market Area 4	Market Area 5
High Frequency and High Capacity Transit (<15-min frequency)	72%	25%	1%	0%	0%
Local Service (<30-min frequency)	97%	86%	25%	<1%	0%
Basic Service (>30-min frequency)	97%	87%	41%	6%	<1%
Commuter & Express Transit	97%	89%	57%	16%	1%
No Transit Access	3%	11%	43%	84%	99%

Source: The Met Council, ACS 2018 5-Year Estimates

Total Employment

The concentration of jobs in an area is also an indication of the level of transit service that may be demanded. Like population density, generally, the underlying demand for transit grows with an increase in employment density. Understanding where there is a concentration of jobs is important when thinking about transit service because in many places, transit services are largely supporting trips to and from work.

Geographic Coverage

In Market Area 1, over three-quarters of all jobs are within walking distance of high frequency transit and nearly 100% within access of local service. A large majority of jobs in Market Area 2 are within reach of local service, while less than half of those within Market Area 3 are within range of basic service.

Along with concentrations in Minneapolis and St. Paul, there are concentrations employment with high enough densities to support frequencies of 30-minute or better along the I-494 corridor near Plymouth, Eden Prairie, and Bloomington, as well as along the I-394 corridor towards Plymouth. While most employment centers have some service, they are mostly unserved by the high frequency network. The local transit network reaches Bloomington, but still leaves most of the western and southern suburban jobs without better than 30-minute service. Eden Prairie, which is the future terminus of the Green Line extension, appears to be the biggest unserved employment area.

Areas of Opportunity

Areas to the west and south of the Twin Cities are currently without high frequency and local transit that could benefit from increased frequencies to the all-day transit network to better serve employment sites.

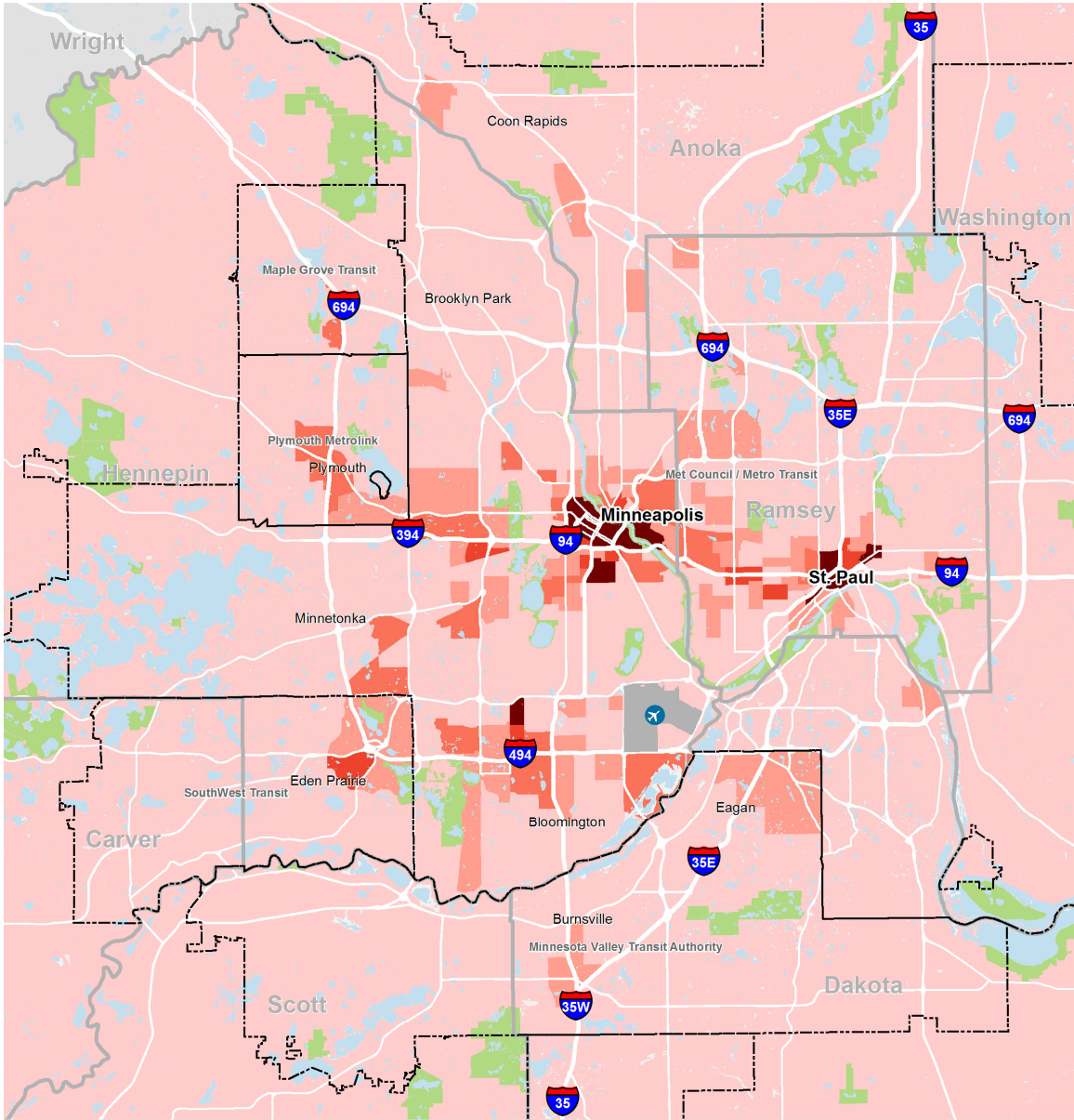
Figure 15 Total Employment Served by Transit Service Level and Market Area

Service Level	Market Area 1	Market Area 2	Market Area 3	Market Area 4	Market Area 5
High Frequency and High Capacity Transit (<15-min frequency)	80%	21%	2%	0%	0%
Local Service (<30-min frequency)	96%	81%	24%	<1%	0%
Basic Service (>30-min frequency)	96%	82%	43%	14%	1%
Commuter & Express Transit	97%	85%	59%	23%	3%
No Transit Access	3%	15%	41%	77%	97%

Source: The Met Council, 2017 LEHD

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Figure 16 Employment Density



Employment Density

Jobs per acre

- Less than 5
- 5 - 10
- 10 - 15
- 15 - 25
- More than 25

- Transit Authority Service Areas
- County Boundary

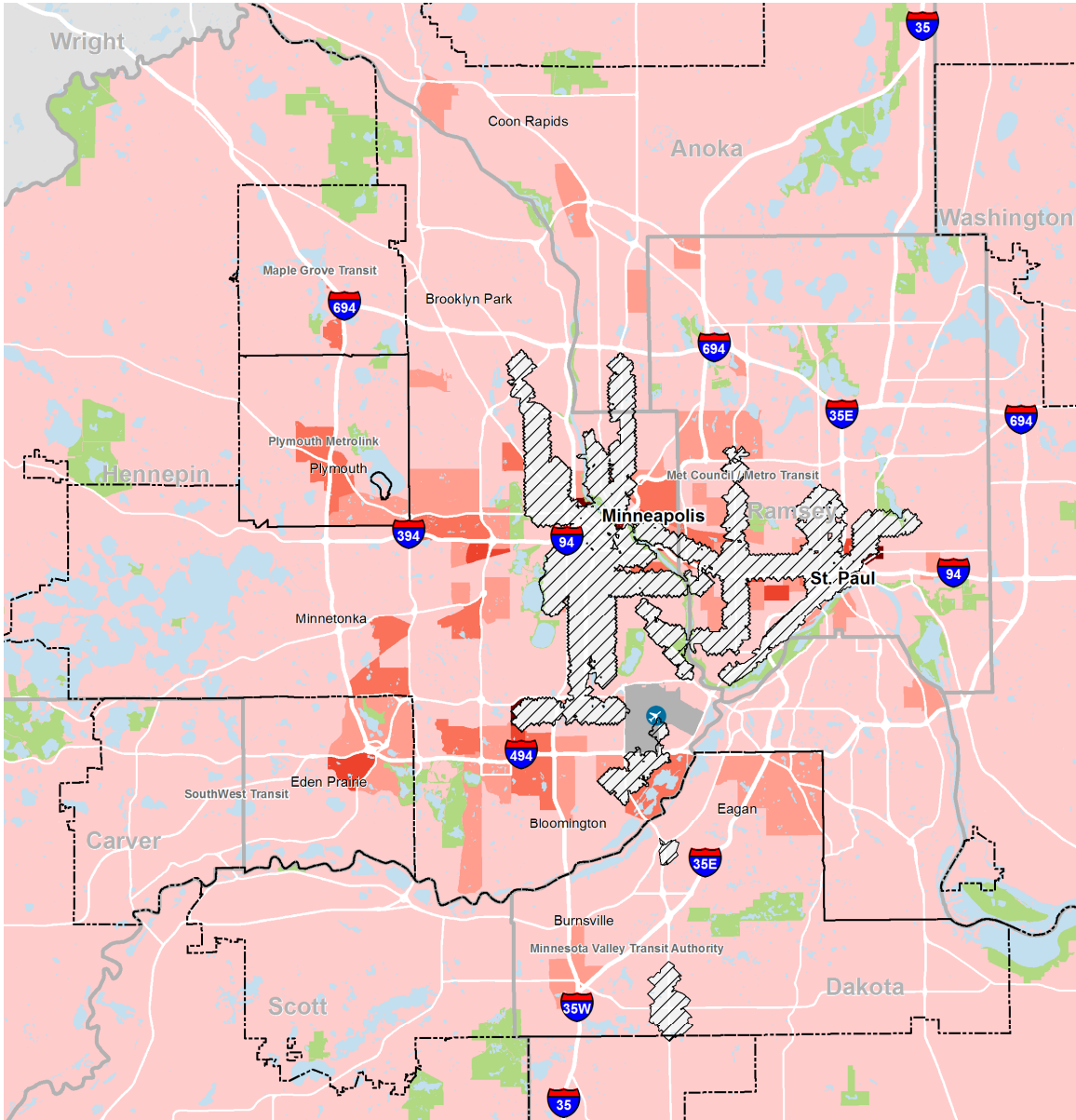
Miles 0 2 4



Source: The Met Council, 2017 LEHD

EXISTING CONDITIONS AND METHODOLOGY MEMO
Metropolitan Council

Figure 17 Employment Not Served by High Frequency Transit Network



Areas Not Served by High Frequency Service Network

Jobs per acre

- Less than 5
- 5 - 10
- 10 - 15
- 15 - 25
- More than 25

- High Frequency Network 10-Minute (800m) Walkshed
- Transit Authority Service Areas
- County Boundary

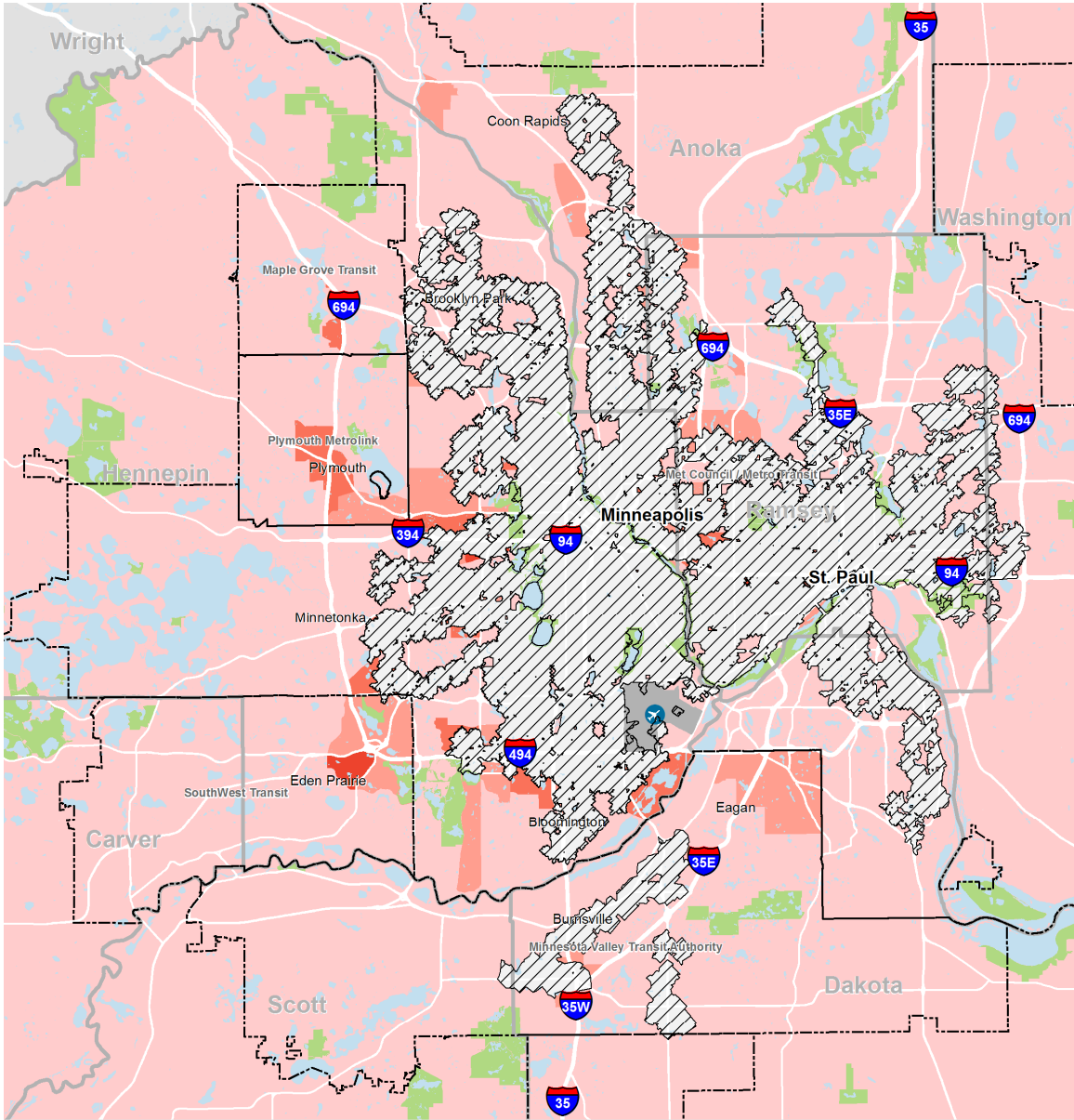
Miles 0 2 4



Source: The Met Council, 2017 LEHD

EXISTING CONDITIONS AND METHODOLOGY MEMO
Metropolitan Council

Figure 18 Employment Not Served by Local Transit Network



Areas Not Served by Local Service Network

Jobs per acre

- Less than 5
- 5 - 10
- 10 - 15
- 15 - 25
- More than 25

- Local Network 10-Minute (800m) Walkshed
- Transit Authority Service Areas
- County Boundary

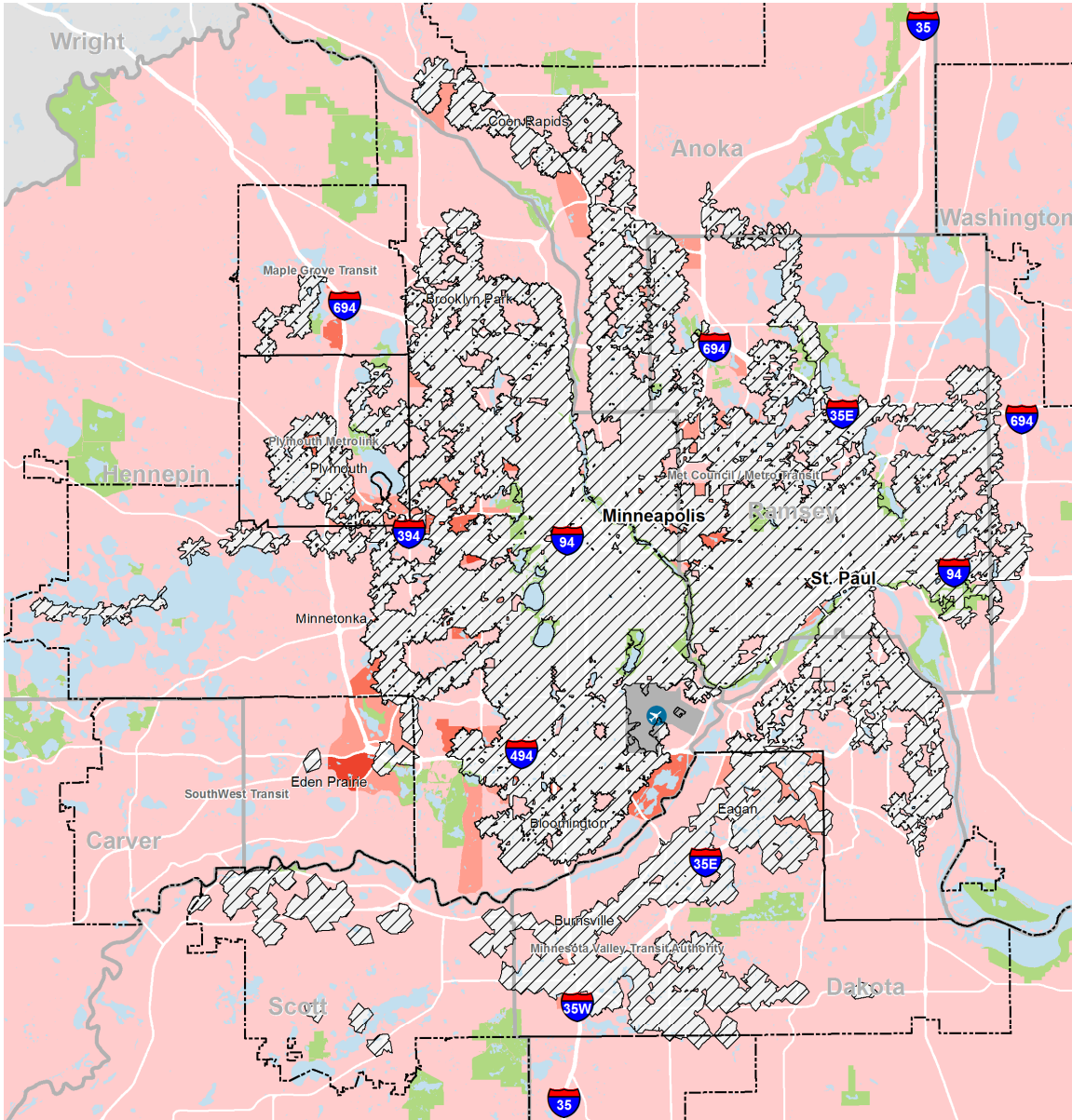
Miles 0 2 4



Source: The Met Council, 2017 LEHD

EXISTING CONDITIONS AND METHODOLOGY MEMO
Metropolitan Council

Figure 19 Employment Not Served by Basic Transit Network



Areas Not Served by Basic Service Network

Jobs per acre

- Less than 5
- 5 - 10
- 10 - 15
- 15 - 25
- More than 25

- Basic Network 10-Minute (800m) Walkshed
- Transit Authority Service Areas
- County Boundary

Miles 0 2 4



Source: The Met Council, 2017 LEHD

Low-Income Population

Geographic Coverage

Transit access for those earning less than 185% of the federal poverty threshold in Market Areas 1 and 2 is similar to that of the total population. In Market Area 3, the low-income population benefits from slightly better access to at least basic services than the general population.

The geographic areas with the highest low-income population density are located mostly within Minneapolis and St. Paul. A significant portion of these tracts are served by high frequency transit. Local transit service in the region serves nearly all areas with higher than average density.

Areas of Opportunity

There are a number of areas in St. Paul, including parts of the East Side, West Side, and North end, as well as southern Minneapolis with above average and much higher than average low-income residents that are just out of reach of the high frequency transit network. There may be an opportunity to increase frequencies on some of the local routes that serve these areas to better serve this population.

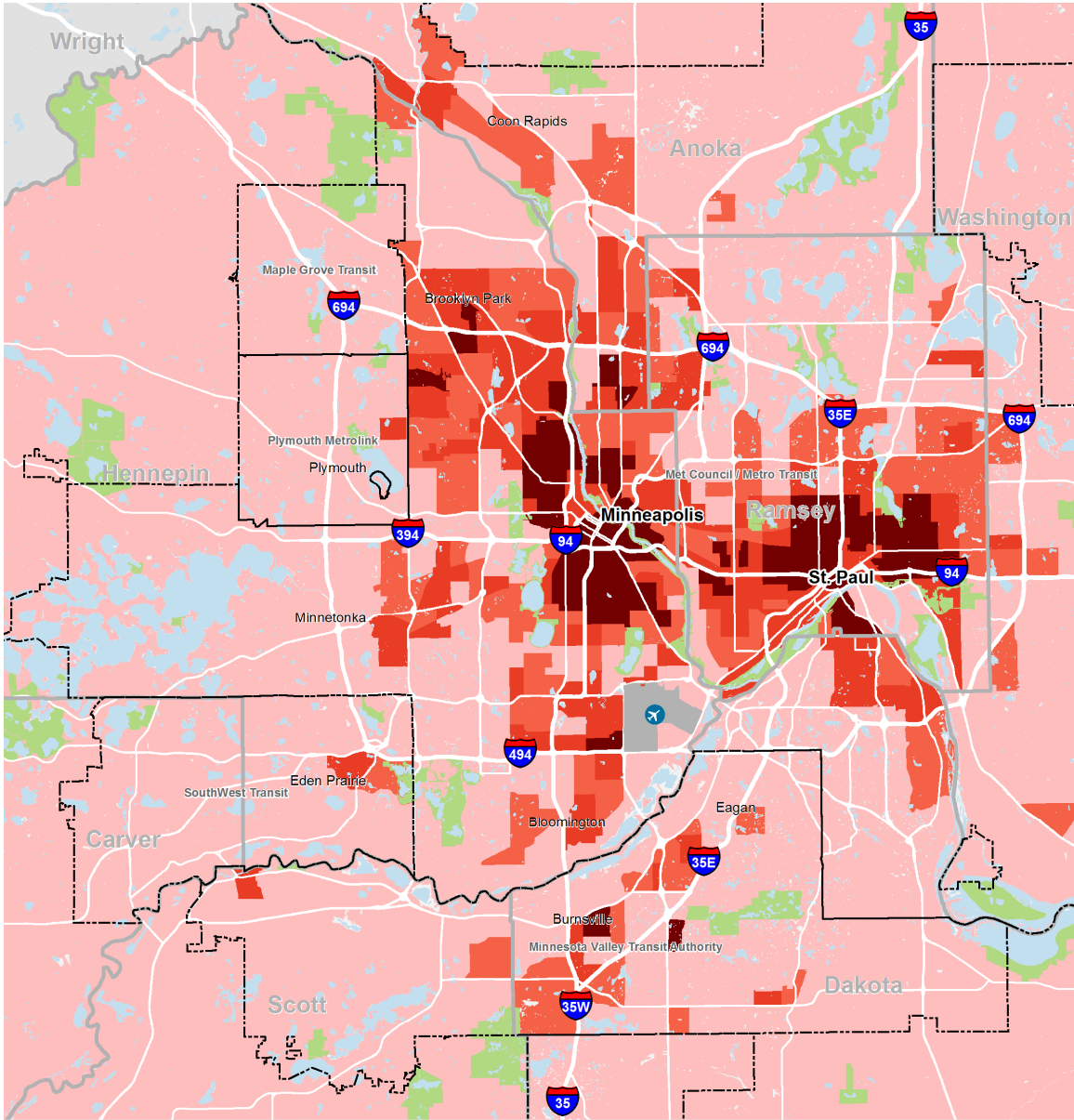
Figure 20 Low-Income Population Served by Transit Service Level and Market Area

Service Level	Market Area 1	Market Area 2	Market Area 3	Market Area 4	Market Area 5
High Frequency and High Capacity Transit (<15-min frequency)	74%	26%	1%	0%	0%
Local Service (<30-min frequency)	97%	87%	33%	<1%	0%
Basic Service (>30-min frequency)	97%	87%	49%	7%	<1%
Commuter & Express Transit	98%	89%	63%	16%	2%
No Transit Access	2%	11%	27%	84%	98%

Source: The Met Council, ACS 2018 5-Year Estimates

EXISTING CONDITIONS AND METHODOLOGY MEMO
Metropolitan Council

Figure 21 Low-Income Population Density



Low-Income Population Density

Low-income population per square mile

- Below average
- Average
- Above average
- Much higher than average

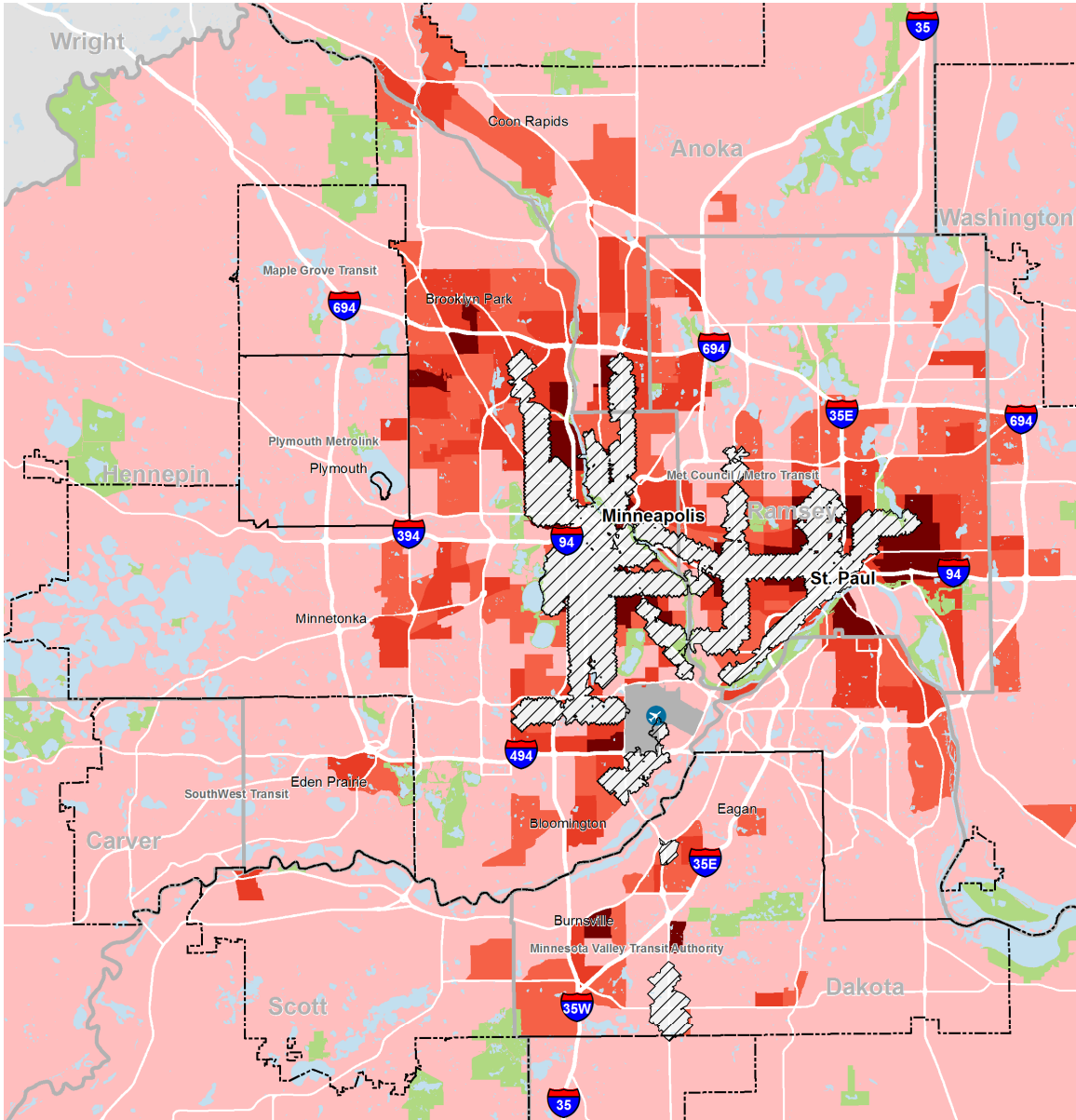
- Transit Authority Service Areas
- County Boundary



Source: The Met Council, ACS 2018 5-Year Estimates





EXISTING CONDITIONS AND METHODOLOGY MEMO
Metropolitan Council

Figure 22 Low-Income Population Not Served by High Frequency Transit Network



Areas Not Served by High Frequency Service Network

Low-income population per square mile

- | | |
|--|--|
|  Below average |  High Frequency Network 10-Minute (800m) Walkshed |
|  Average |  Transit Authority Service Areas |
|  Above average |  County Boundary |
|  Much higher than average | |

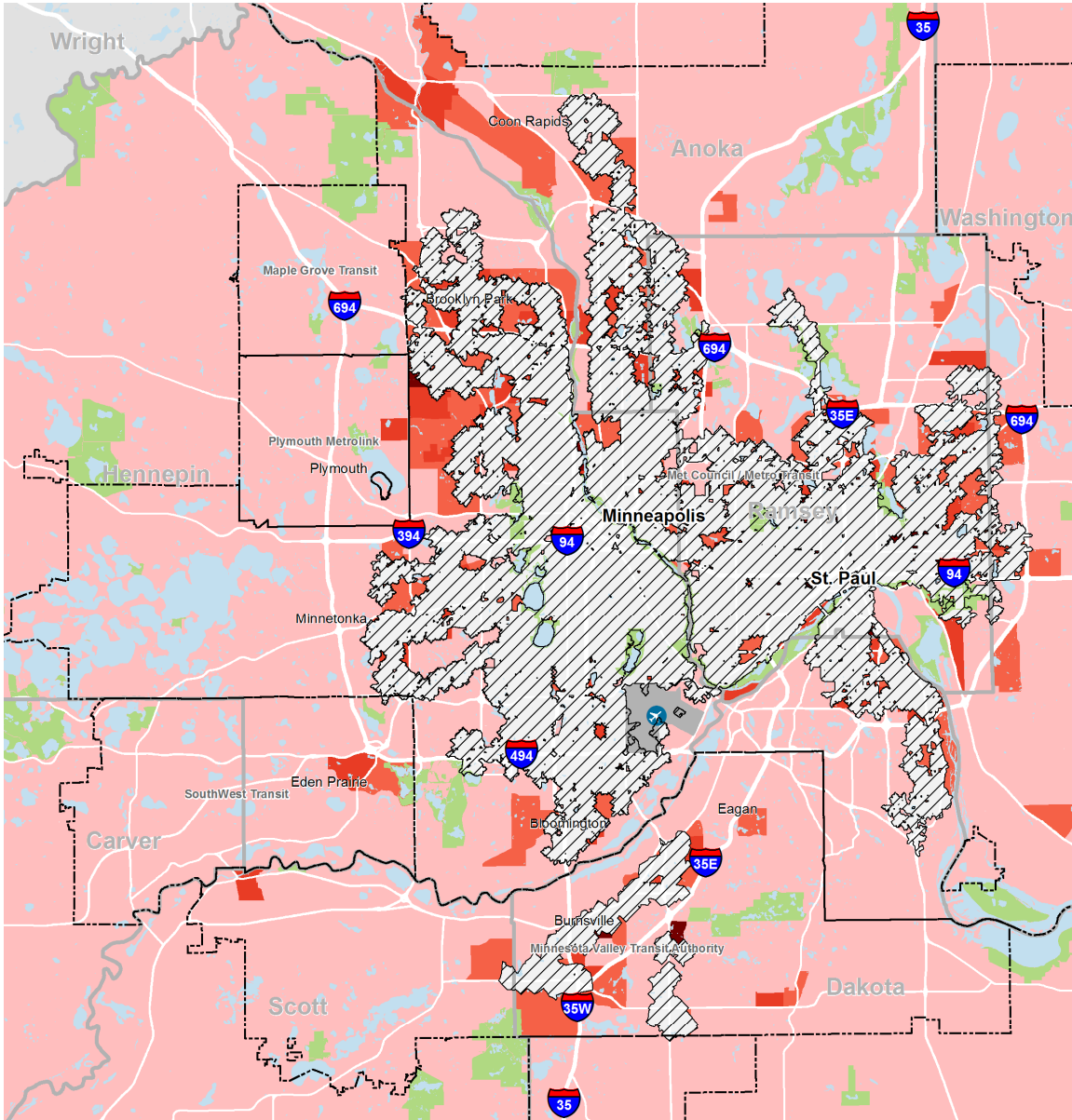
Miles 0 2 4



Source: The Met Council, ACS 2018 5-Year Estimates








EXISTING CONDITIONS AND METHODOLOGY MEMO
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Figure 23 Low-Income Population Not Served by Local Transit Network



Areas Not Served by Local Service Network

Low-income population per square mile

- | | |
|--|---|
|  Below average |  Local Network 10-Minute (800m) Walkshed |
|  Average |  Transit Authority Service Areas |
|  Above average |  County Boundary |
|  Much higher than average | |

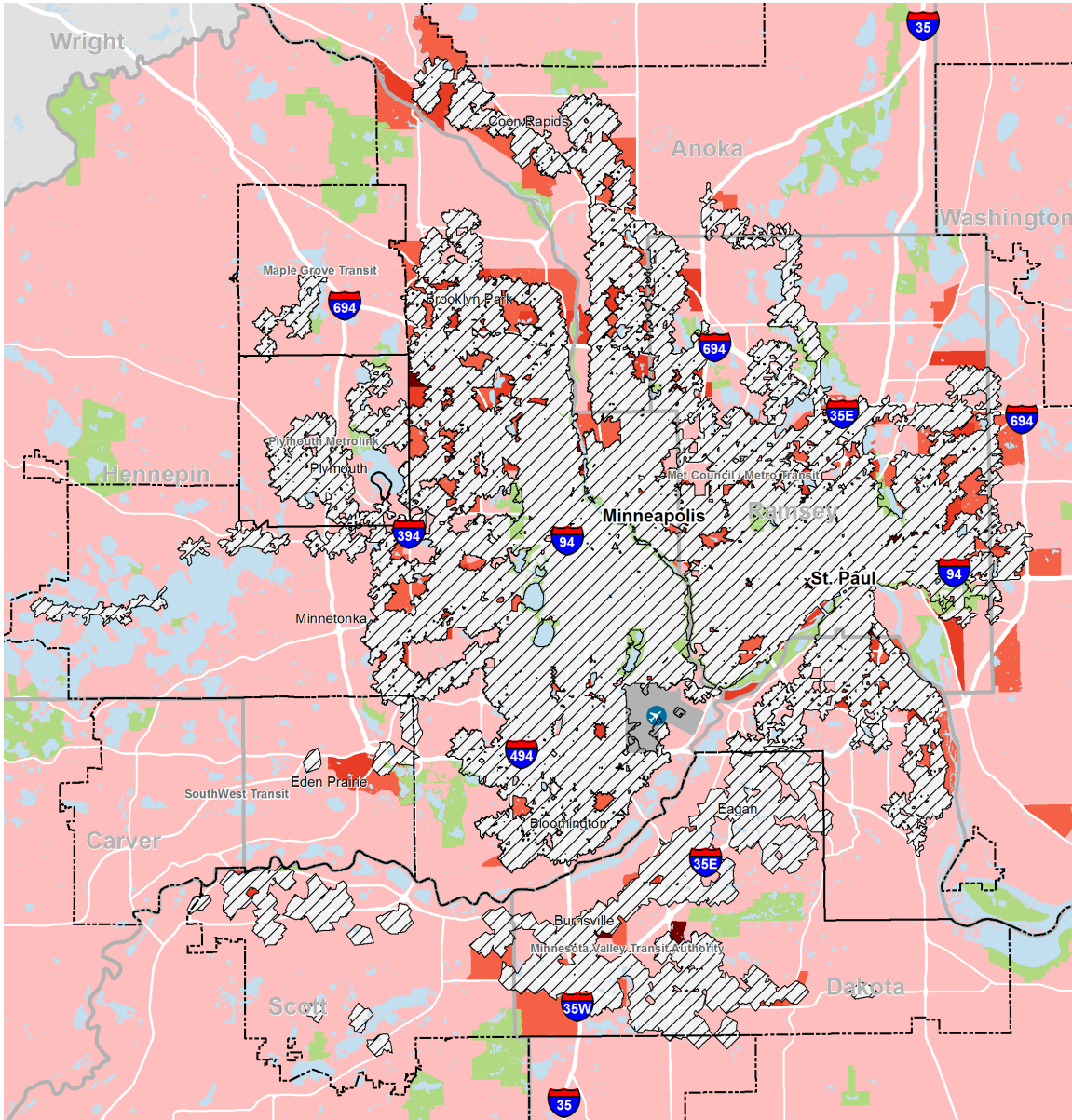
Miles 0 2 4



Source: The Met Council, ACS 2018 5-Year Estimates

EXISTING CONDITIONS AND METHODOLOGY MEMO
Metropolitan Council

Figure 24 Low-Income Population Not Served by Basic Transit Network



Areas Not Served by Basic Service Network

Low-income population per square mile

- | | |
|---|--|
| Below average | Basic Network 10-Minute (800m) Walkshed |
| Average | Transit Authority Service Areas |
| Above average | County Boundary |
| Much higher than average | |

Miles 0 2 4



Source: The Met Council, ACS 2018 5-Year Estimates

Low-Income Population in ACPs

Geographic Coverage

The average census tract in the region has 577 low-income individuals per square mile. The existing transit network supports many of the most disadvantaged communities in the region. In Market Area 1, three-quarters of the low-income population in areas of concentrated poverty have access to high frequency transit. Nearly 90% in Market Area 2 and over 50% in Market Area 3 have access to at least 30-minute service. Of the few ACPs that lie within Market Area 4, one-third of residents have access to basic and commuter & express services, leaving two-thirds without any access to transit.

Geographically, the majority of ACPs fall within the boundaries of Minneapolis and St. Paul. High frequency transit serves the more centrally located ACPs but leaves many in northern Minneapolis and in the non-central areas of St. Paul without frequent transit. Most ACPs are within reach of at least local transit and nearly all of the remaining are touched by basic transit.

Areas of Opportunity

Many ACPs in Market Area 1 and 2 are without access to high frequency transit. Like with the low-income population, there is opportunity to increase frequencies on the local routes that serve the areas outside of the current network. There may be an opportunity to increase the frequencies on the basic routes in the suburban areas in order to provide those disadvantaged communities with a reliable form of transportation.

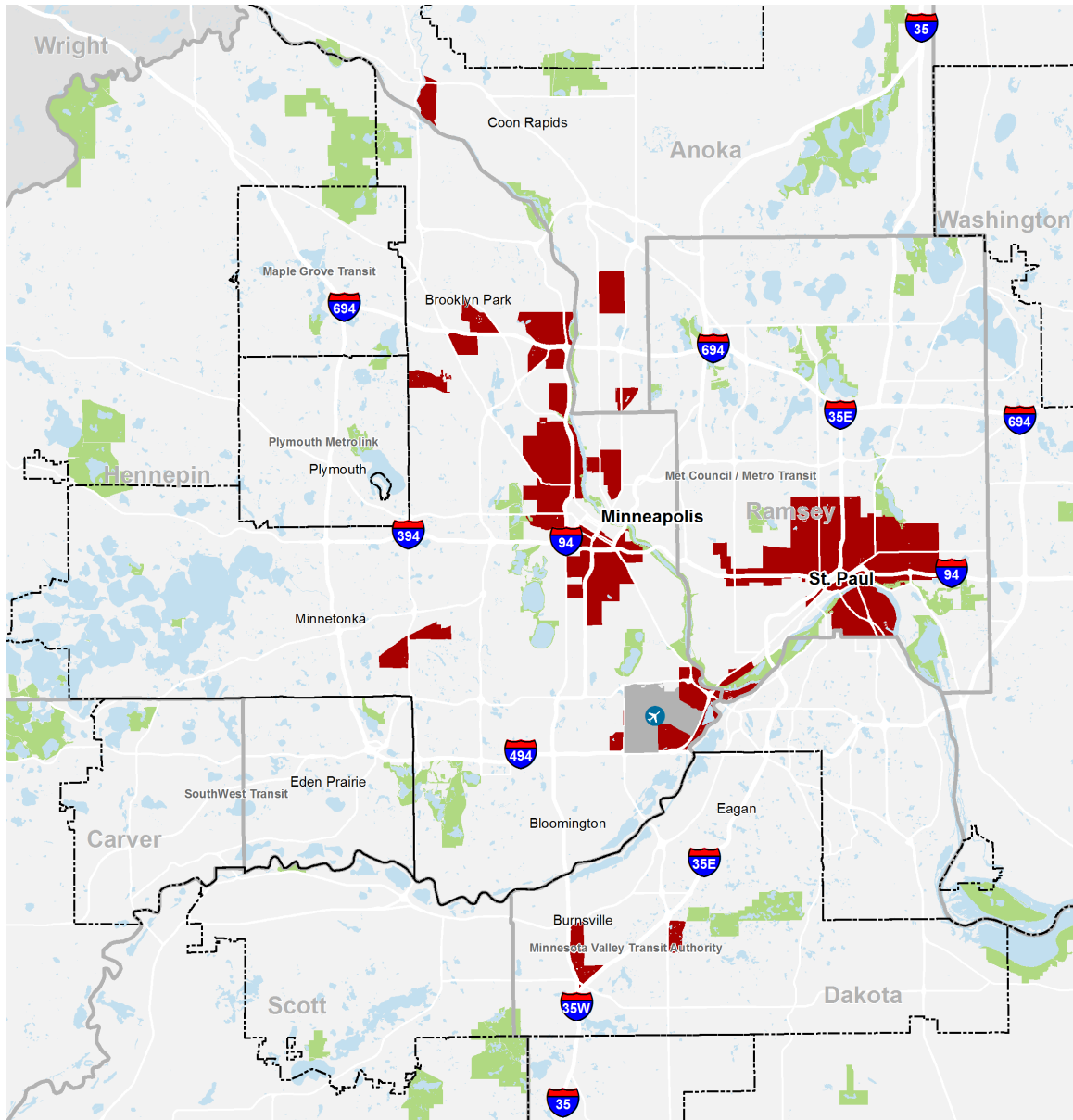
Figure 25 Low-Income Population within ACPs Served by Transit Service Level and Market Area

Service Level	Market Area 1	Market Area 2	Market Area 3	Market Area 4	Market Area 5
High Frequency and High Capacity Transit (<15-min frequency)	79%	23%	1%	0%	N/A
Local Service (<30-min frequency)	98%	87%	68%	37%	N/A
Basic Service (>30-min frequency)	98%	89%	79%	37%	N/A
Commuter & Express Transit	98%	89%	87%	37%	N/A
No Transit Access	2%	11%	23%	63%	N/A

Source: The Met Council, ACS 2018 5-Year Estimates

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Metropolitan Council

Figure 26 Areas of Concentrated Poverty (ACPs)



Areas of Concentrated Poverty

■ Areas of Concentrated Poverty

▭ Transit Authority Service Areas

▭ County Boundary

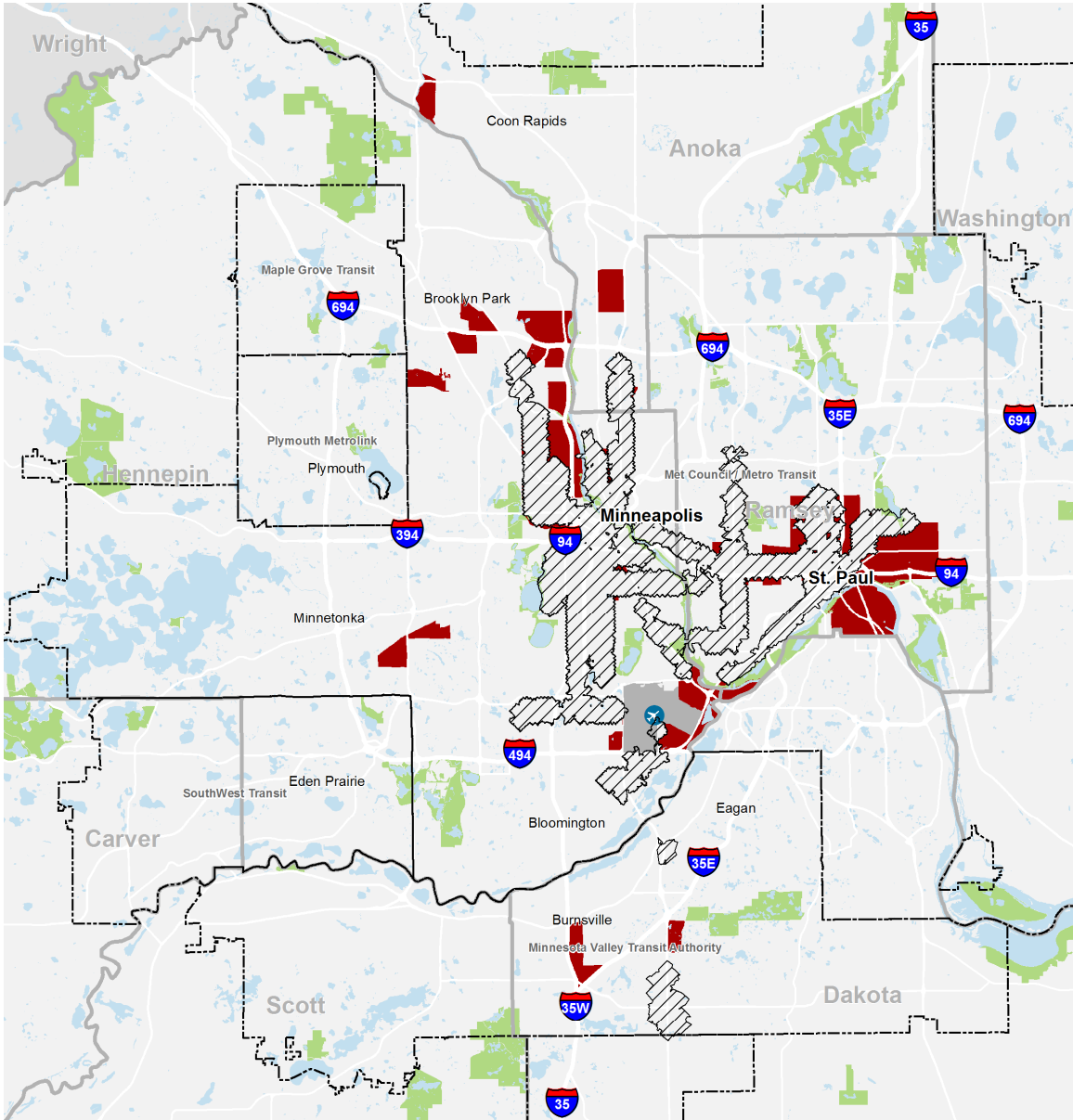
Miles 0 2 4



Source: The Met Council, ACS 2018 5-Year Estimates

EXISTING CONDITIONS AND METHODOLOGY MEMO
Metropolitan Council

Figure 27 Areas of Concentrated Poverty (ACPs) Not Served by High Frequency Transit Network



ACPs Not Served by High Frequency Service Network

- ACPs Not Served by High Frequency Service Network
- High Frequency Network 10-Minute (800m) Walkshed
- Transit Authority Service Areas
- County Boundary

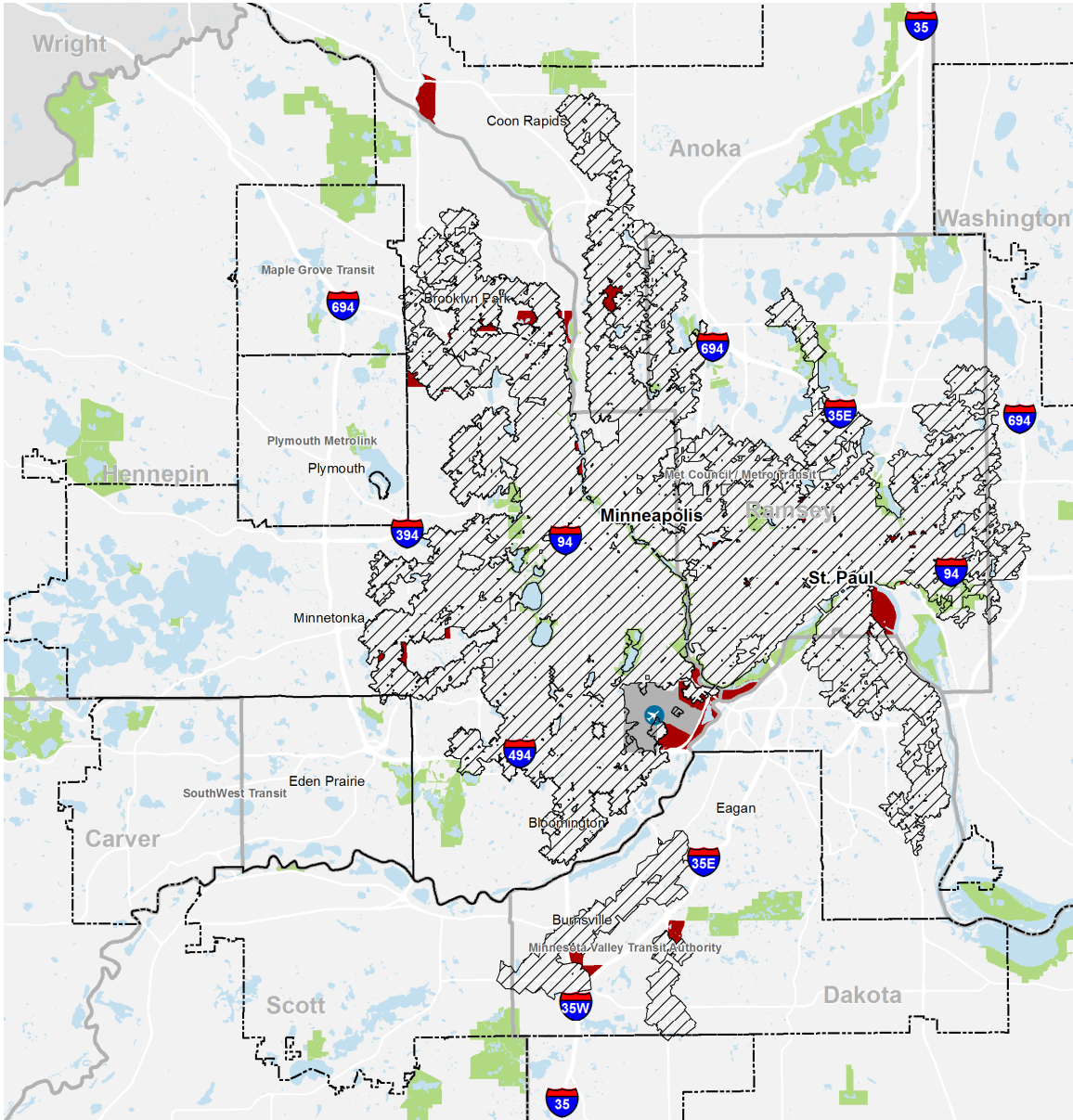
Miles 0 2 4



Source: The Met Council, ACS 2018 5-Year Estimates

EXISTING CONDITIONS AND METHODOLOGY MEMO
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Figure 28 Areas of Concentrated Poverty (ACPs) Not Served by Local Transit Network



ACPs Not Served by Local Service

- ACPs Not Served by Local Service Network
- Local Network 10-Minute (800m) Walkshed
- Transit Authority Service Areas
- County Boundary

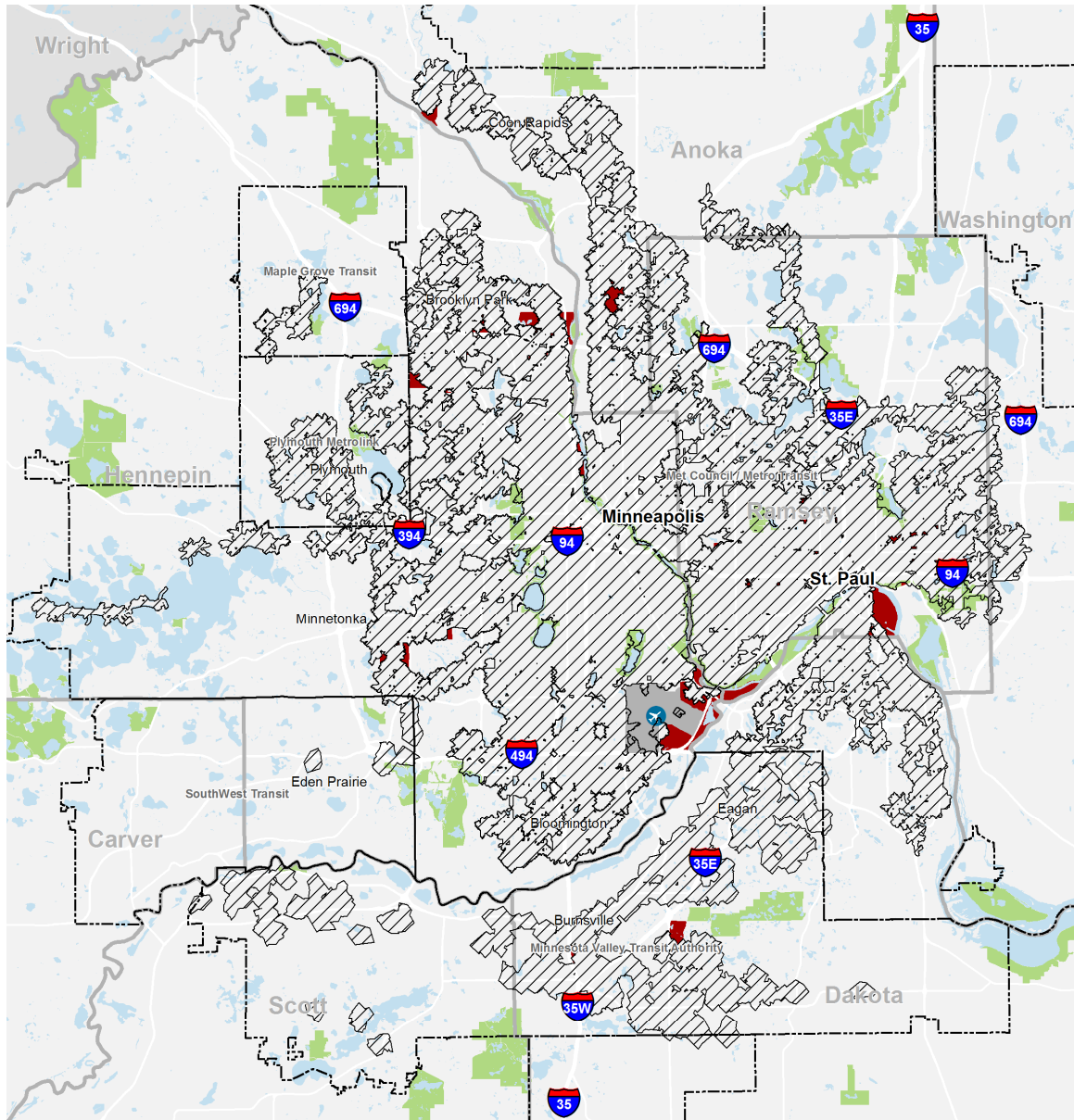
Miles 0 2 4



Source: The Met Council, ACS 2018 5-Year Estimates

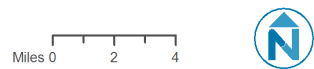
EXISTING CONDITIONS AND METHODOLOGY MEMO
Metropolitan Council

Figure 29 Areas of Concentrated Poverty (ACPs) Not Served by Basic Transit Network



ACPs Not Served by Basic Service Network

- ACPs Not Served by Basic Service Network
- Lifeline Network 10-Minute (800m) Walkshed
- Transit Authority Service Areas
- County Boundary



Source: The Met Council, ACS 2018 5-Year Estimates

Non-White Population

Geographic Coverage

The average census tract in the region has 667 people of colors per square mile. Like the region’s low-income population, the large majority of non-white residents in Market Areas 1, 2 and 3, the majority have access to transit with 30-minute frequencies. Meanwhile, about one-quarter of the non-white population living within Market Area 3 only have access to basic services.

Of the densest areas of regional non-white population, those in Minneapolis are well covered by the high frequency network. The local transit network covers most of the high-density non-white areas, with the exception of a few areas to the northwest of Minneapolis. Basic service serves most of the remaining areas.

Areas of Opportunity

In addition to the areas of opportunity identified for region’s low-income population, there are areas of above average non-white population density in northwest and south Minneapolis, as well as in northern and eastern St. Paul, that are out of reach of the current high capacity and local transit networks.

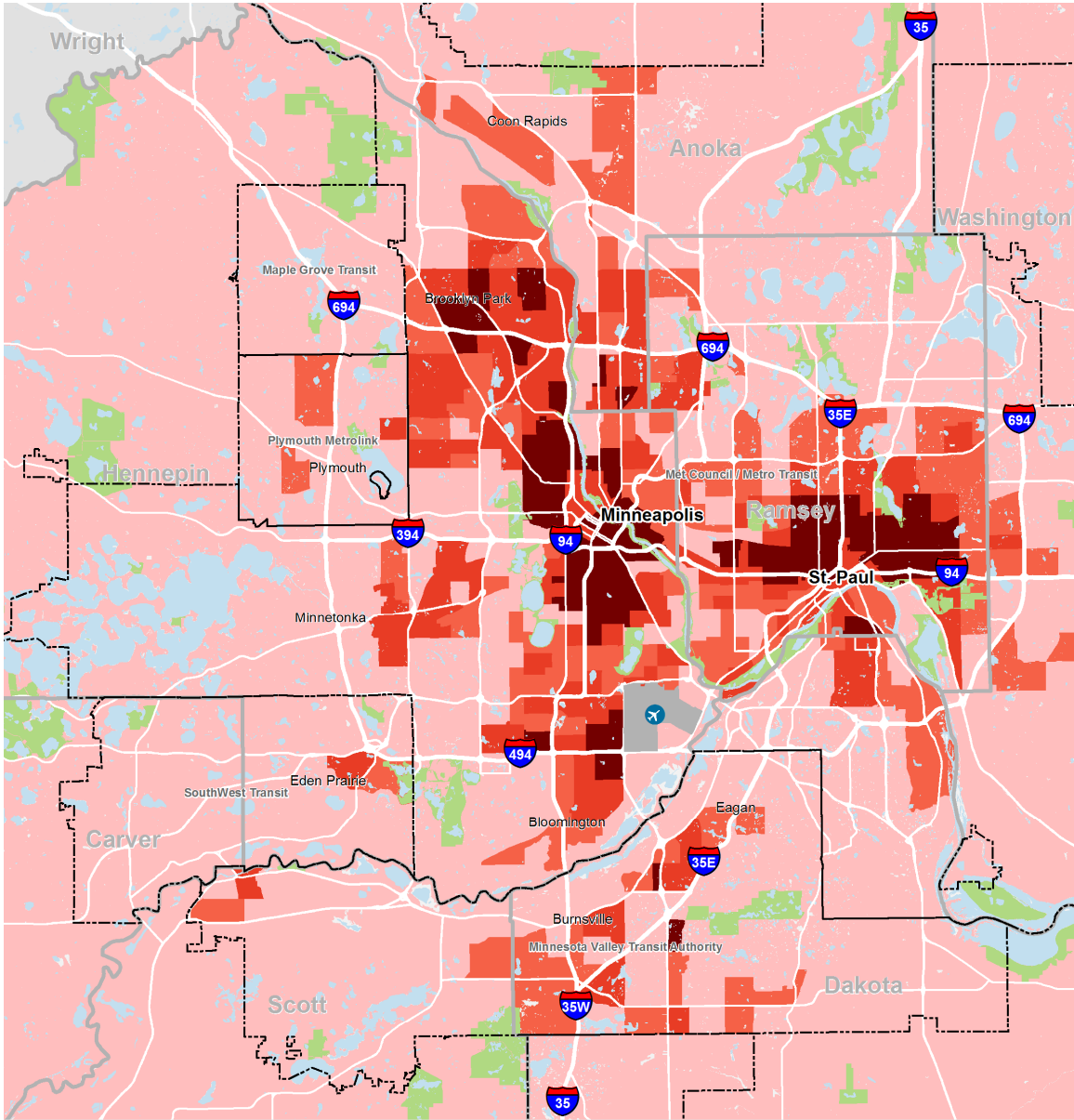
Figure 30 Non-White Population Served by Transit Service Level and Market Area

Service Level	Market Area 1	Market Area 2	Market Area 3	Market Area 4	Market Area 5
High Frequency and High Capacity Transit (<15-min frequency)	76%	25%	2%	0%	0%
Local Service (<30-min frequency)	98%	87%	32%	<1%	0%
Basic Service (>30-min frequency)	98%	88%	48%	7%	<1%
Commuter & Express Transit	98%	90%	62%	17%	1%
No Transit Access	2%	10%	28%	83%	99%

Source: The Met Council, ACS 2018 5-Year Estimates

EXISTING CONDITIONS AND METHODOLOGY MEMO
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Figure 31 Non-White Population Density



Non-White Population Density

Non-white population per square mile

- Below average
- Average
- Above average
- Much higher than average

- Transit Authority Service Areas
- County Boundary

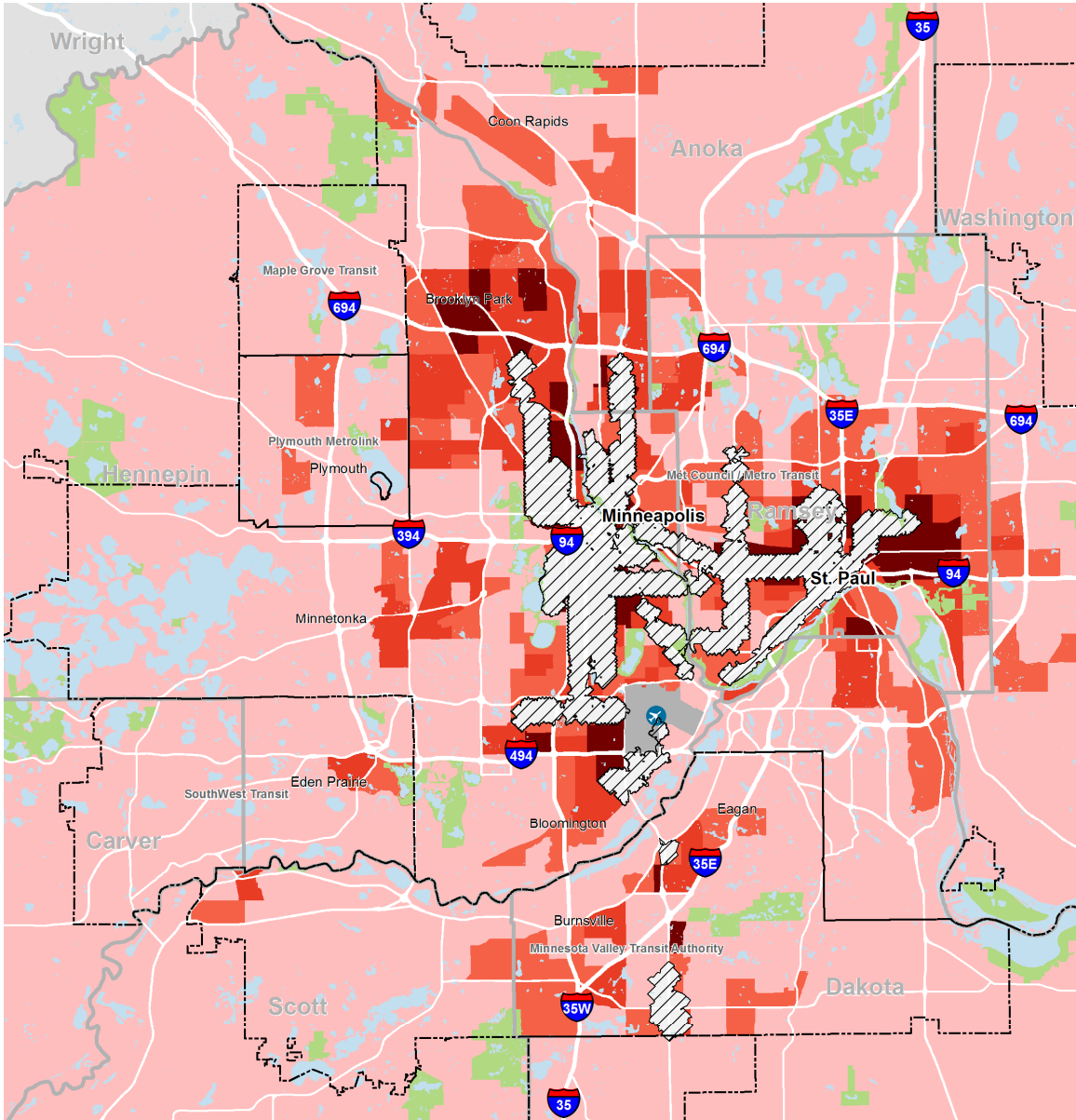
Miles 0 2 4






Source: The Met Council, ACS 2018 5-Year Estimates

EXISTING CONDITIONS AND METHODOLOGY MEMO
Metropolitan Council

Figure 32 Non-White Population Not Served by High Frequency Transit Network



Areas Not Served by High Frequency Service Network
Non-white population per square mile

- | | |
|--|--|
|  Below average |  High Frequency Network 10-Minute (800m) Walkshed |
|  Average |  Transit Authority Service Areas |
|  Above average |  County Boundary |
|  Much higher than average | |

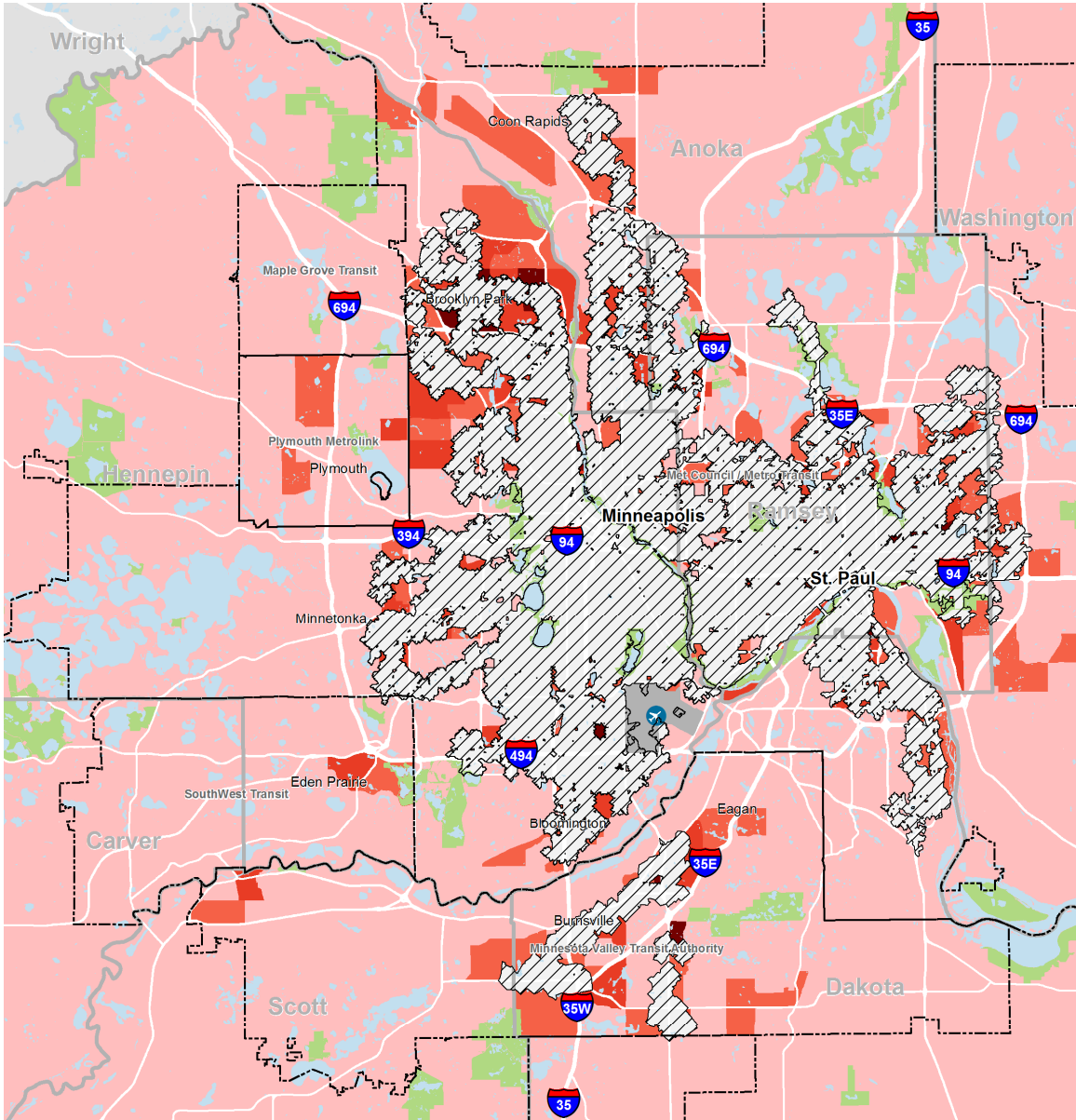
Miles 0 2 4



Source: The Met Council, ACS 2018 5-Year Estimates








EXISTING CONDITIONS AND METHODOLOGY MEMO
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Figure 33 Non-White Population Not Served by Local Transit Network



Areas Not Served by Local Service Network

Non-white population per square mile

- | | | | |
|---|--------------------------|---|---|
|  | Below average |  | Local Network 10-Minute (800m) Walkshed |
|  | Average |  | Transit Authority Service Areas |
|  | Above average |  | County Boundary |
|  | Much higher than average | | |

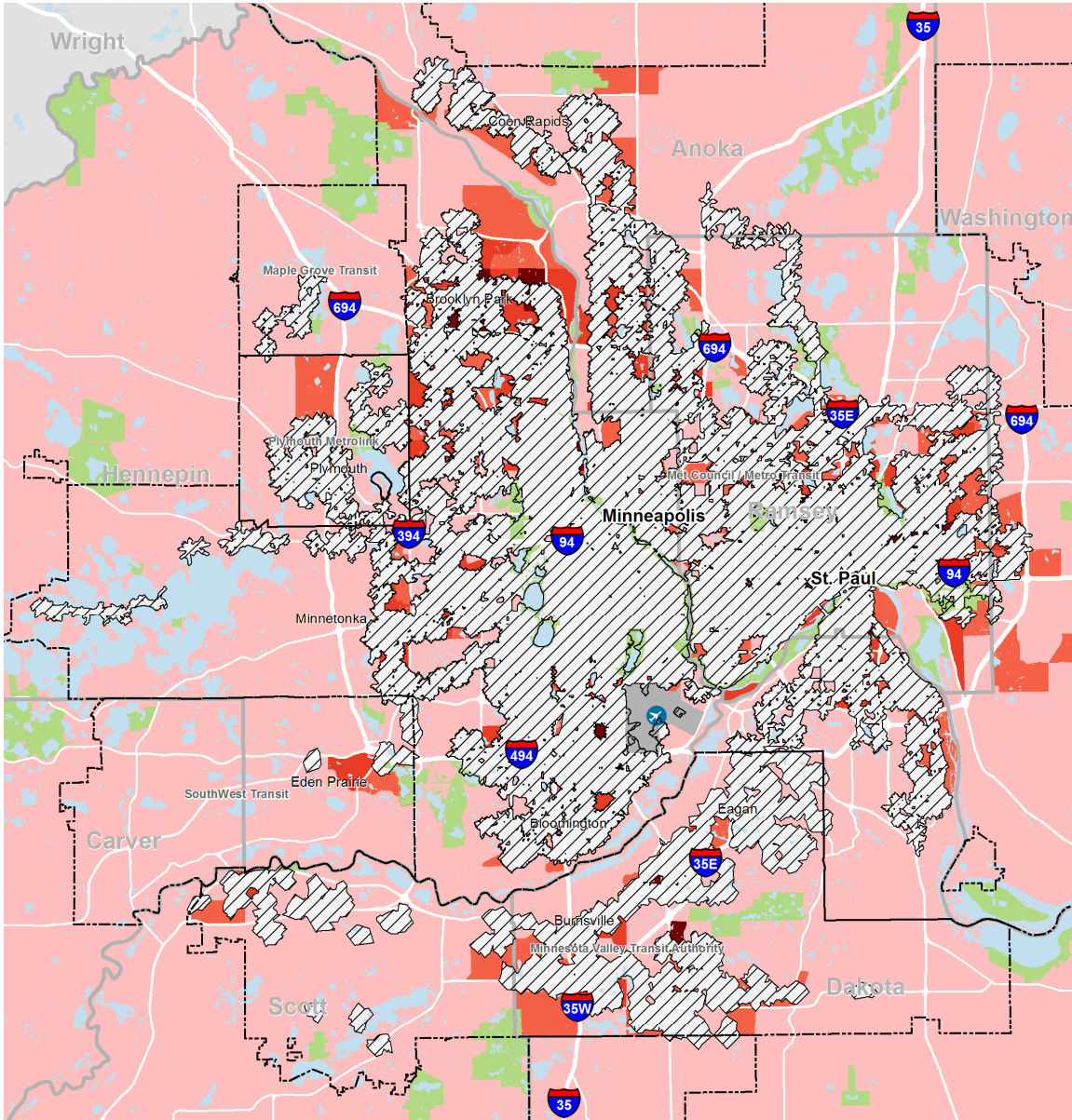
Miles 0 2 4



Source: The Met Council, ACS 2018 5-Year Estimates








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Figure 34 Non-White Population Not Served by Basic Transit Network



Areas Not Served by Basic Service Network

Non-white population per square mile

- | | | | |
|---|--------------------------|---|---|
|  | Below average |  | Basic Network 10-Minute (800m) Walkshed |
|  | Average |  | Transit Authority Service Areas |
|  | Above average |  | County Boundary |
|  | Much higher than average | | |

Source: The Met Council, ACS 2018 5-Year Estimates

Low Vehicle Access Population

Geographic Coverage

The average census tract in the region has 26 individuals without access to a vehicle per square mile. Of those living without access to a personal vehicle in Market Areas 1 and 2, the majority have access to transit with 30-minute frequencies. Into Market Area 3, only one-quarter have access to local transit and less than half have access to basic services.

Areas with the highest concentrations of low vehicle access are centered in Minneapolis and St. Paul. The high frequency network serves a majority of these areas. Most of the remaining areas are served by at least 30-minute transit frequencies.

Areas of Opportunity

The areas of opportunity to better serve communities with above average densities of people without access to personal vehicles are similar to those discussed above, with some additional concentrations to the west of Minneapolis.

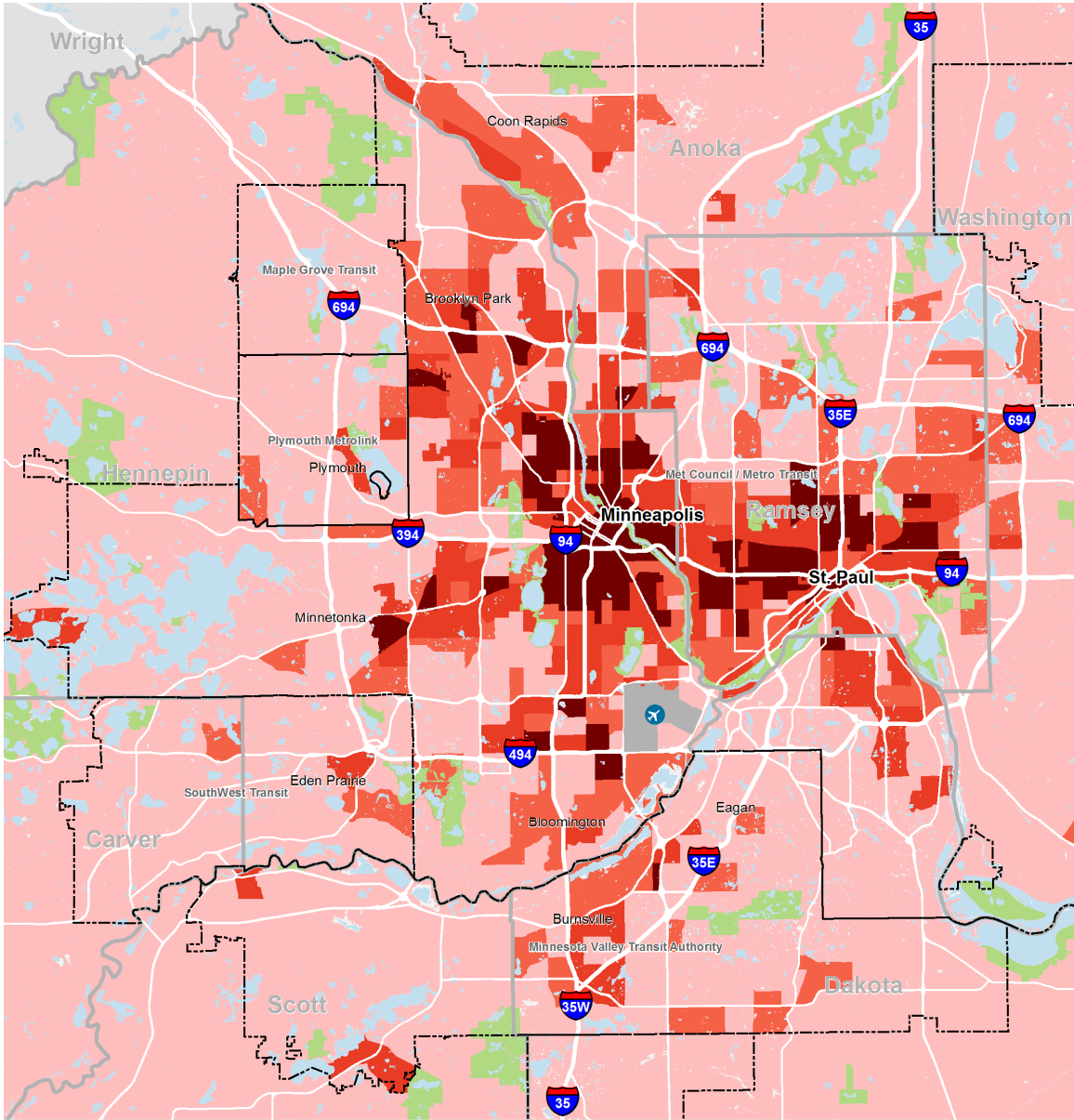
Figure 35 Low Vehicle Access Population Served by Transit Service Level and Market Area

Service Level	Market Area 1	Market Area 2	Market Area 3	Market Area 4	Market Area 5
High Frequency and High Capacity Transit (<15-min frequency)	79%	28%	1%	0%	0%
Local Service (<30-min frequency)	97%	88%	34%	<1%	0%
Basic Service (>30-min frequency)	98%	88%	49%	7%	<1%
Commuter & Express Transit	98%	90%	63%	16%	1%
No Transit Access	2%	10%	37%	84%	99%

Source: The Met Council, ACS 2018 5-Year Estimates

EXISTING CONDITIONS AND METHODOLOGY MEMO
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Figure 36 Limited Auto Access Density



Limited Auto Access

Individuals without auto access per square mile

- Below average
- Average
- Above average
- Much higher than average

- Transit Authority Service Areas
- County Boundary

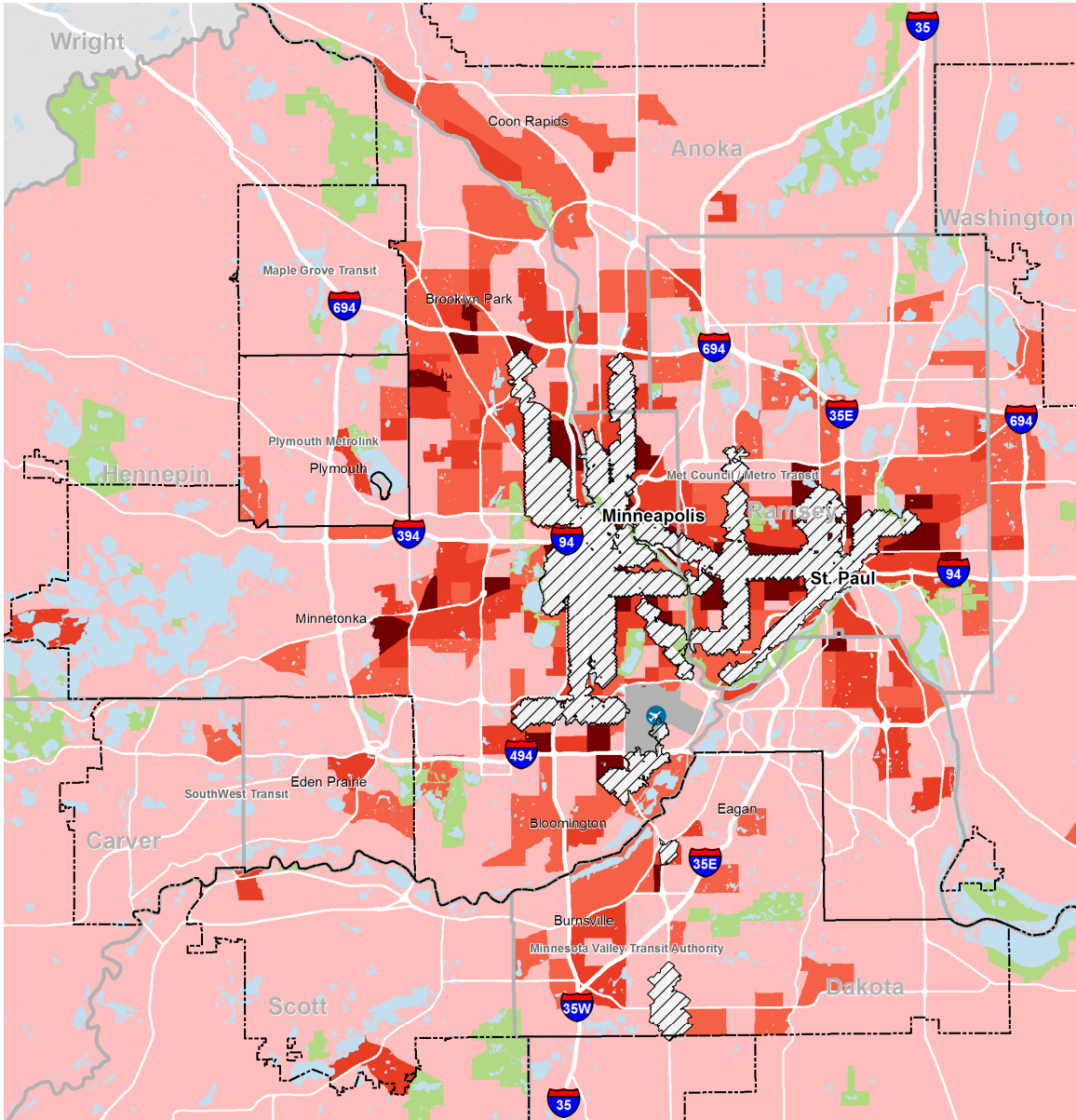
Miles 0 2 4



Source: The Met Council, ACS 2018 5-Year Estimates

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Figure 37 Limited Auto Access Population Not Served by High Frequency Transit Network



Areas Not Served by High Frequency Service Network

Individuals without auto access per square mile

- Below average
- Average
- Above average
- Much higher than average

- High Frequency Network 10-Minute (800m) Walkshed
- Transit Authority Service Areas
- County Boundary

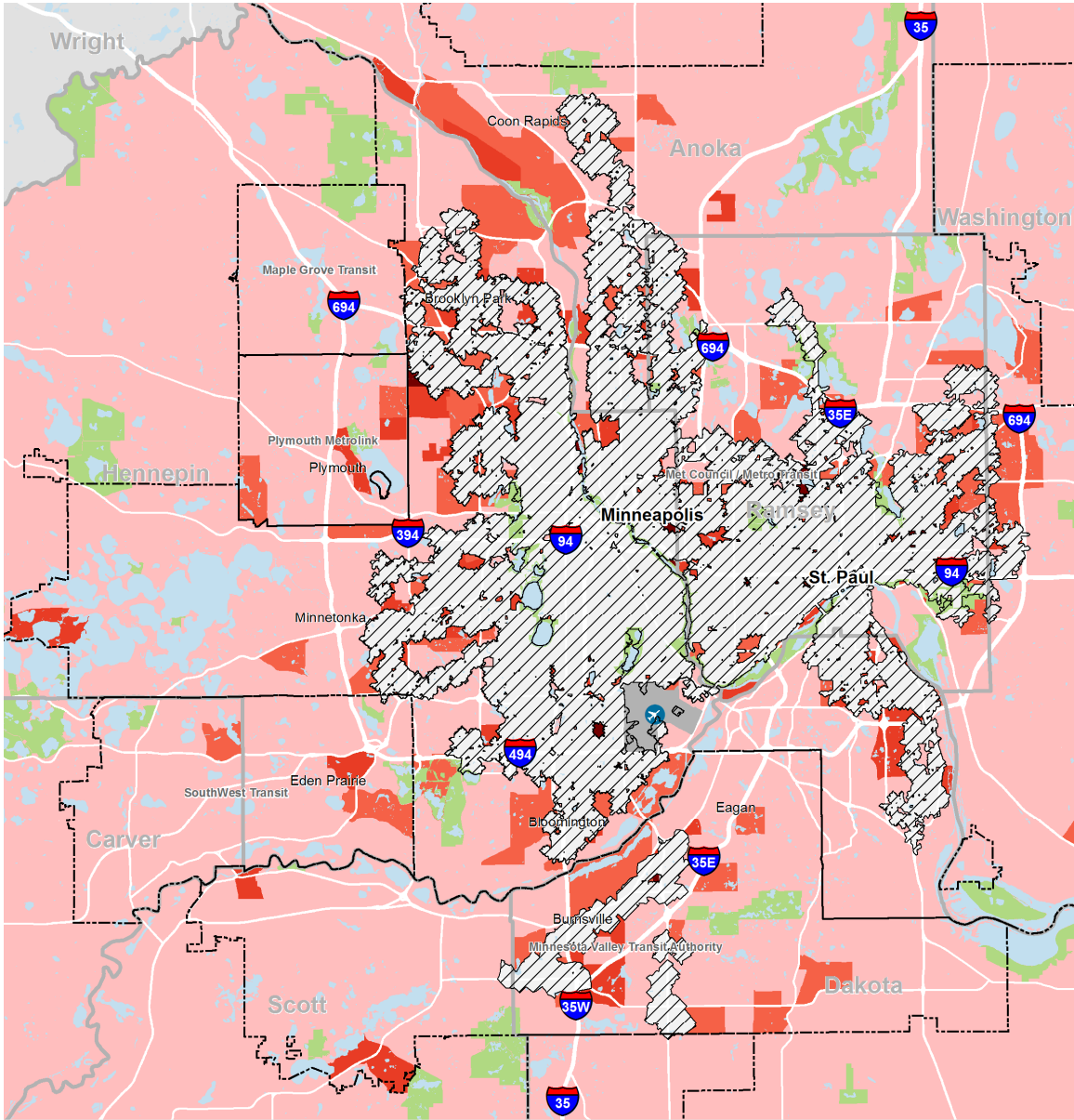
Miles 0 2 4



Source: The Met Council, ACS 2018 5-Year Estimates








EXISTING CONDITIONS AND METHODOLOGY MEMO
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Figure 38 Limited Auto Access Population Not Served by Local Transit Network



Areas Not Served by Local Service Network

Individuals without auto access per square mile

- | | |
|--|---|
|  Below average |  Local Network 10-Minute (800m) Walkshed |
|  Average |  Transit Authority Service Areas |
|  Above average |  County Boundary |
|  Much higher than average | |

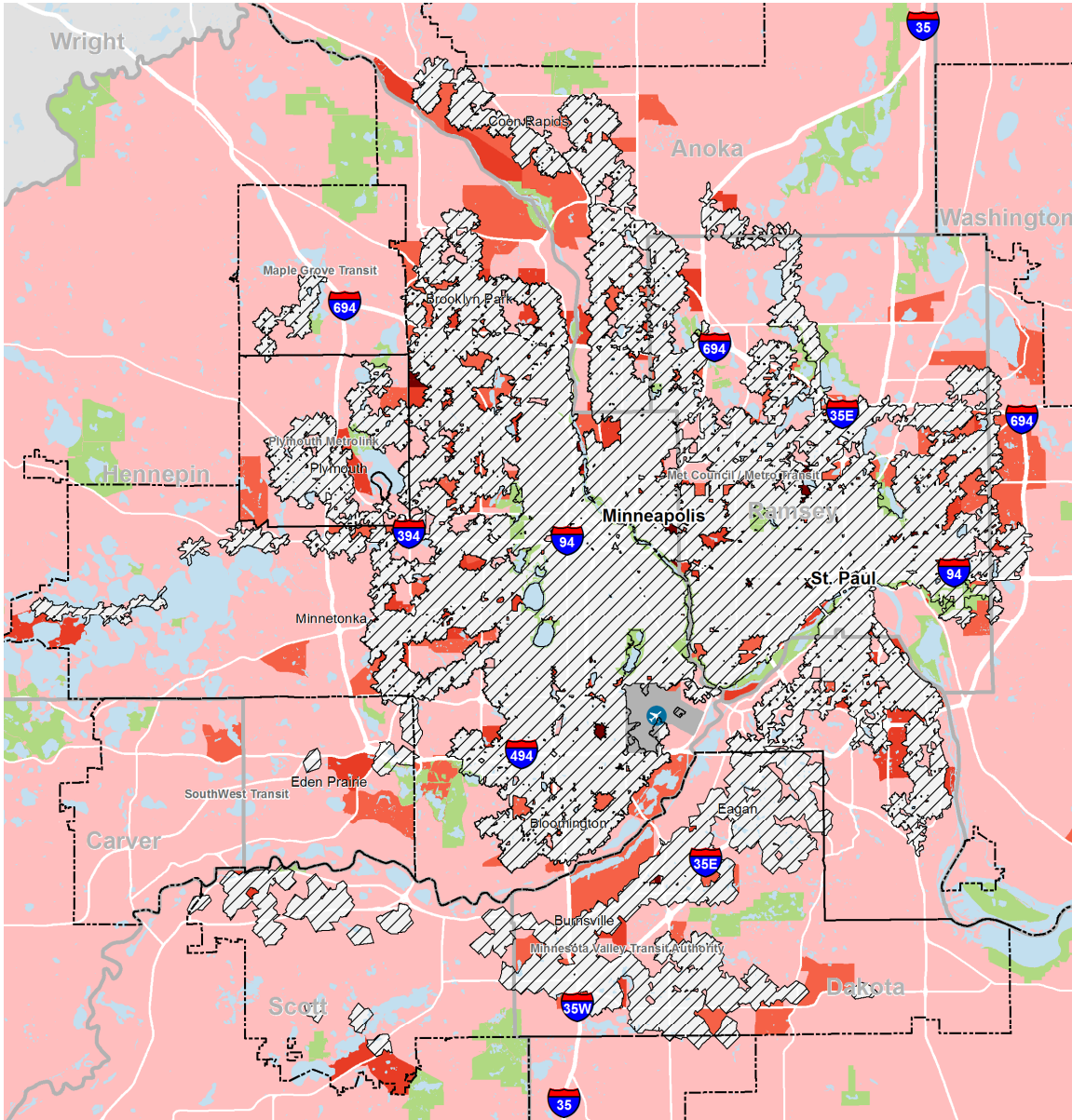
Miles 0 2 4



Source: The Met Council, ACS 2018 5-Year Estimates

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Figure 39 Limited Auto Access Population Not Served by Basic Transit Network



Areas Not Served by Basic Service Network

Individuals without auto access per square mile

- Below average
- Average
- Above average
- Much higher than average
- Basic Network 10-Minute (800m) Walkshed
- Transit Authority Service Areas
- County Boundary

Miles 0 2 4



Source: The Met Council, ACS 2018 5-Year Estimates

Senior Population

Geographic Coverage

The average census tract in the region has 460 seniors per square mile. Local transit service reaches the large majority of the senior population in Market Areas 1 and 2. In Market Area 3, less than half of seniors have access to at least basic service.

The areas with the highest concentrations of senior populations are more scattered throughout the region than the other population and employment groups. The high frequency network leaves many of these areas without frequent transit, while the local transit network serves the majority of areas with the highest densities of senior residents. However, it should be noted that there is not a significant relationship between seniors and transit ridership in the Twin Cities region. According to a 2019 Household Travel Survey done by the Met Council, less than 5% of those 65 or older use transit⁸.

Areas of Opportunity

There are concentrations of areas of opportunity on the southern end of the Twin Cities that could benefit from increased frequencies to the local transit network. Areas with much higher than average densities of seniors to the northwest of St. Paul and west of Minneapolis are currently not served by transit. While seniors are a growing demographic group, nationwide experience has shown there is no longer a strong correlation between senior populations and transit ridership. The Met Council’s Travel Behavior Inventory 2019 Household Travel Survey confirms this trend, as it shows those aged 65 and over have the highest percentage of driving of any age group.

Figure 40 Senior Population Served by Transit Service Level and Market Area

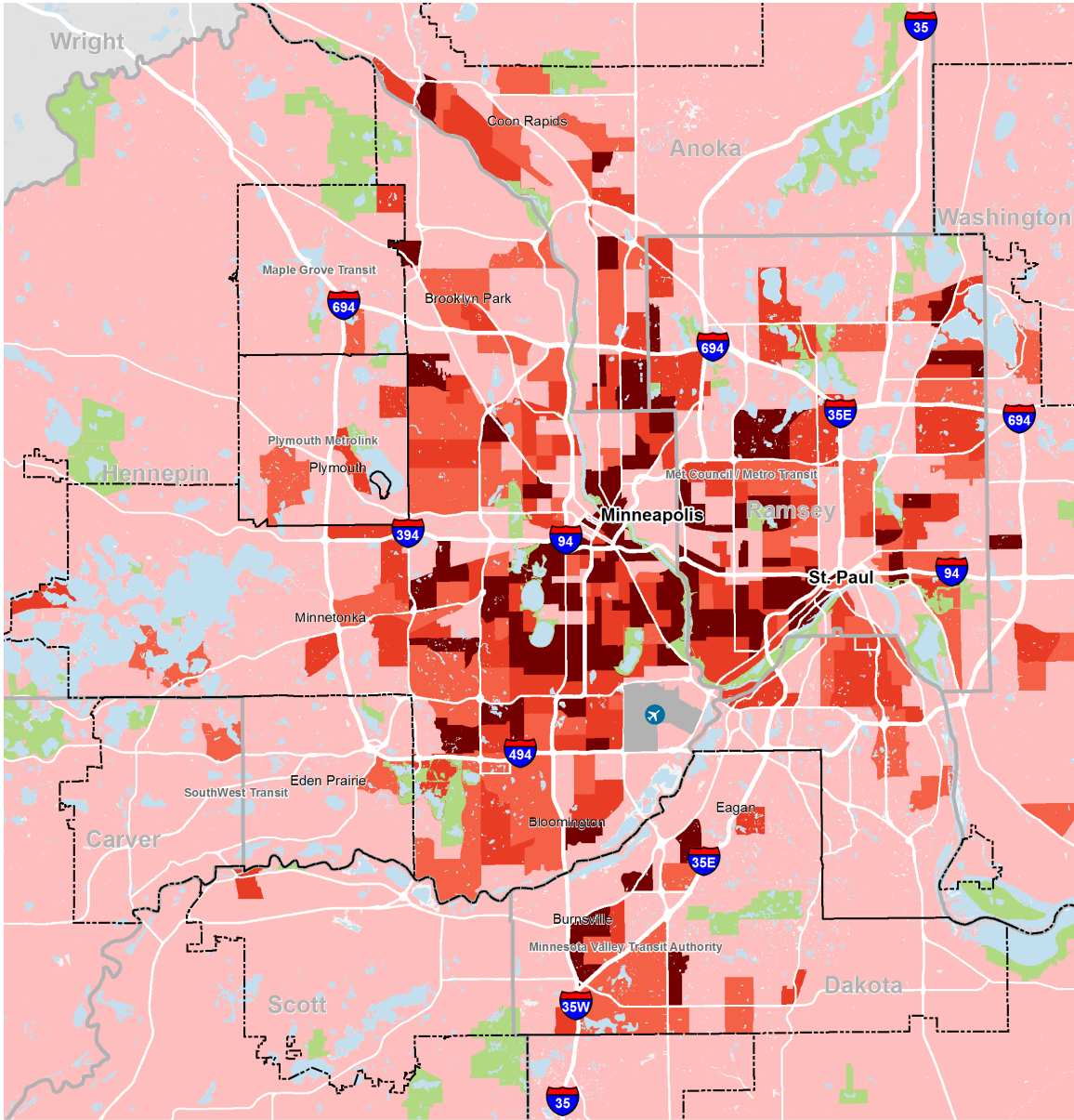
Service Level	Market Area 1	Market Area 2	Market Area 3	Market Area 4	Market Area 5
High Frequency and High Capacity Transit (<15-min frequency)	71%	25%	2%	0%	0%
Local Service (<30-min frequency)	95%	84%	26%	<1%	0%
Basic Service (>30-min frequency)	95%	86%	43%	7%	1%
Commuter & Express Transit	96%	88%	59%	18%	2%
No Transit Access	4%	12%	41%	82%	98%

Source: The Met Council, ACS 2018 5-Year Estimates

⁸ Travel Behavior Inventory 2019 Household Travel Survey, Metropolitan Council

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Figure 41 Senior Population Density



Senior Population Density

Senior population per square mile

- Below average
- Average
- Above average
- Much higher than average

- Transit Authority Service Areas
- County Boundary

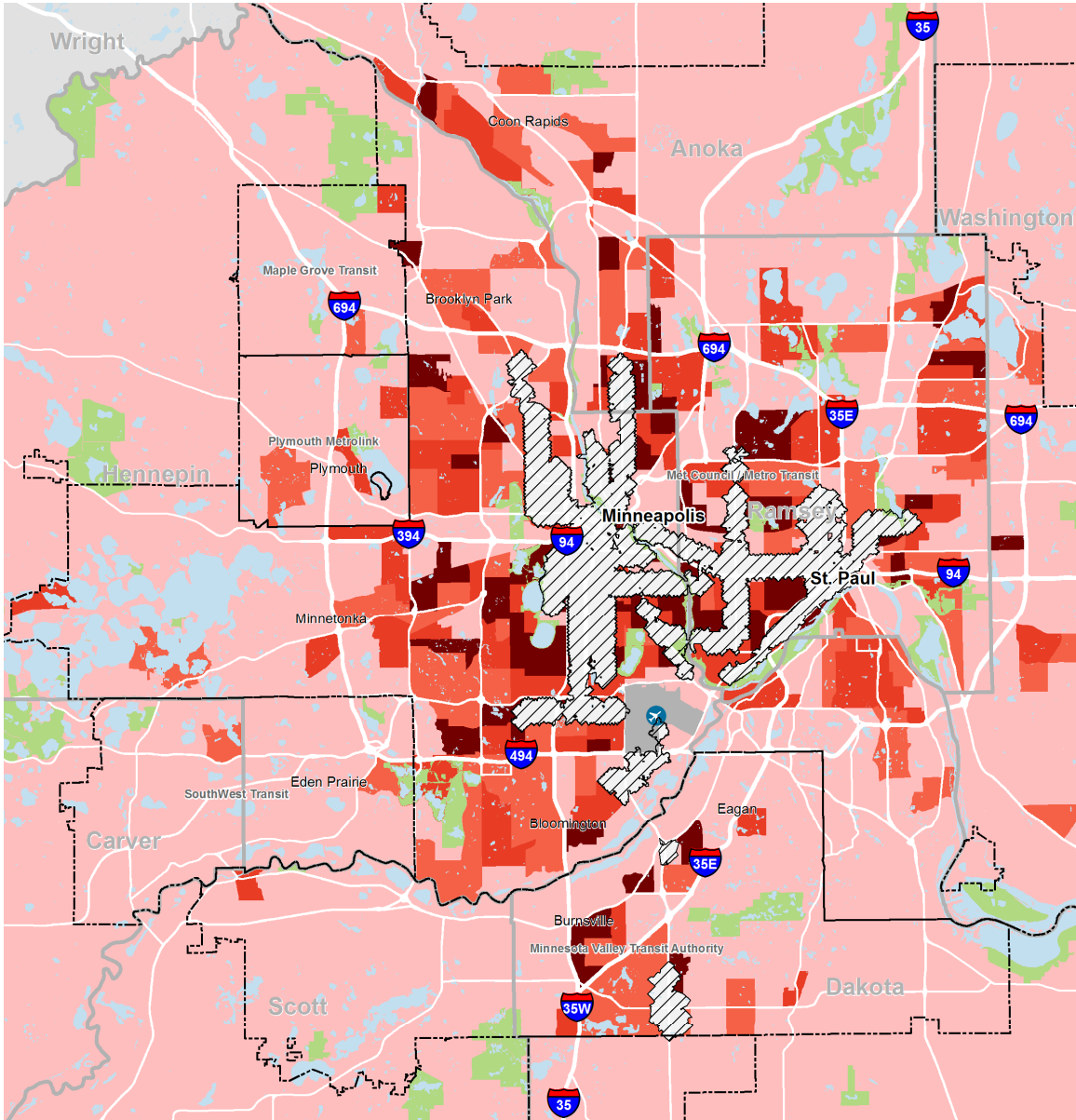
Miles 0 2 4



Source: The Met Council, ACS 2018 5-Year Estimates



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Figure 42 Senior Population Not Served by High Frequency Transit Network



Areas Not Served by High Frequency Service Network

Senior population per square mile

- | | |
|--|--|
|  Below average |  High Frequency Network 10-Minute (800m) Walkshed |
|  Average |  Transit Authority Service Areas |
|  Above average |  County Boundary |
|  Much higher than average | |

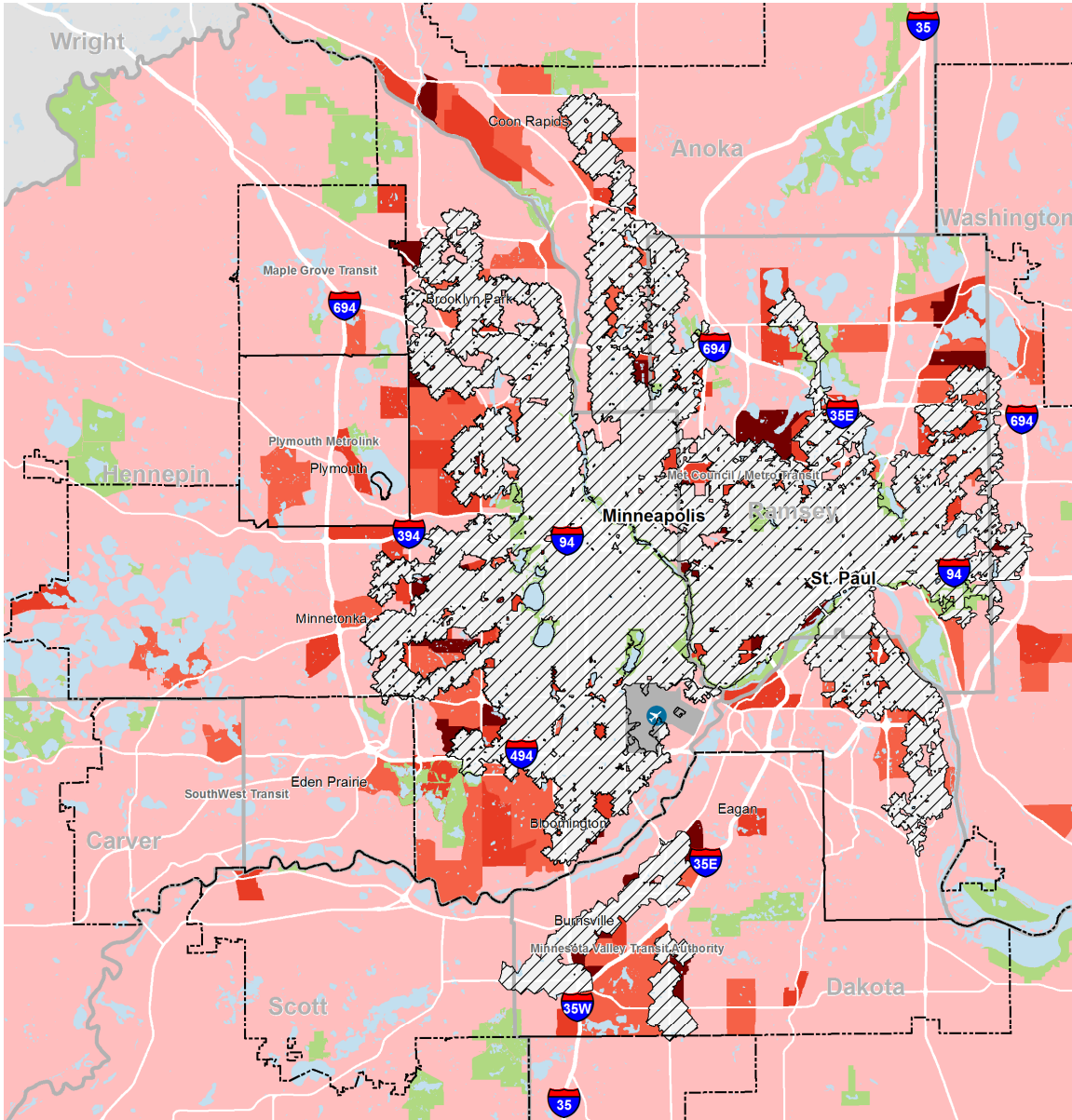
Miles 0 2 4



Source: The Met Council, ACS 2018 5-Year Estimates

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Figure 43 Senior Population Not Served by Local Transit Network



Areas Not Served by Local Service Network

Senior population per square mile

- Below average
- Average
- Above average
- Much higher than average

- Local Network 10-Minute (800m) Walkshed
- Transit Authority Service Areas
- County Boundary

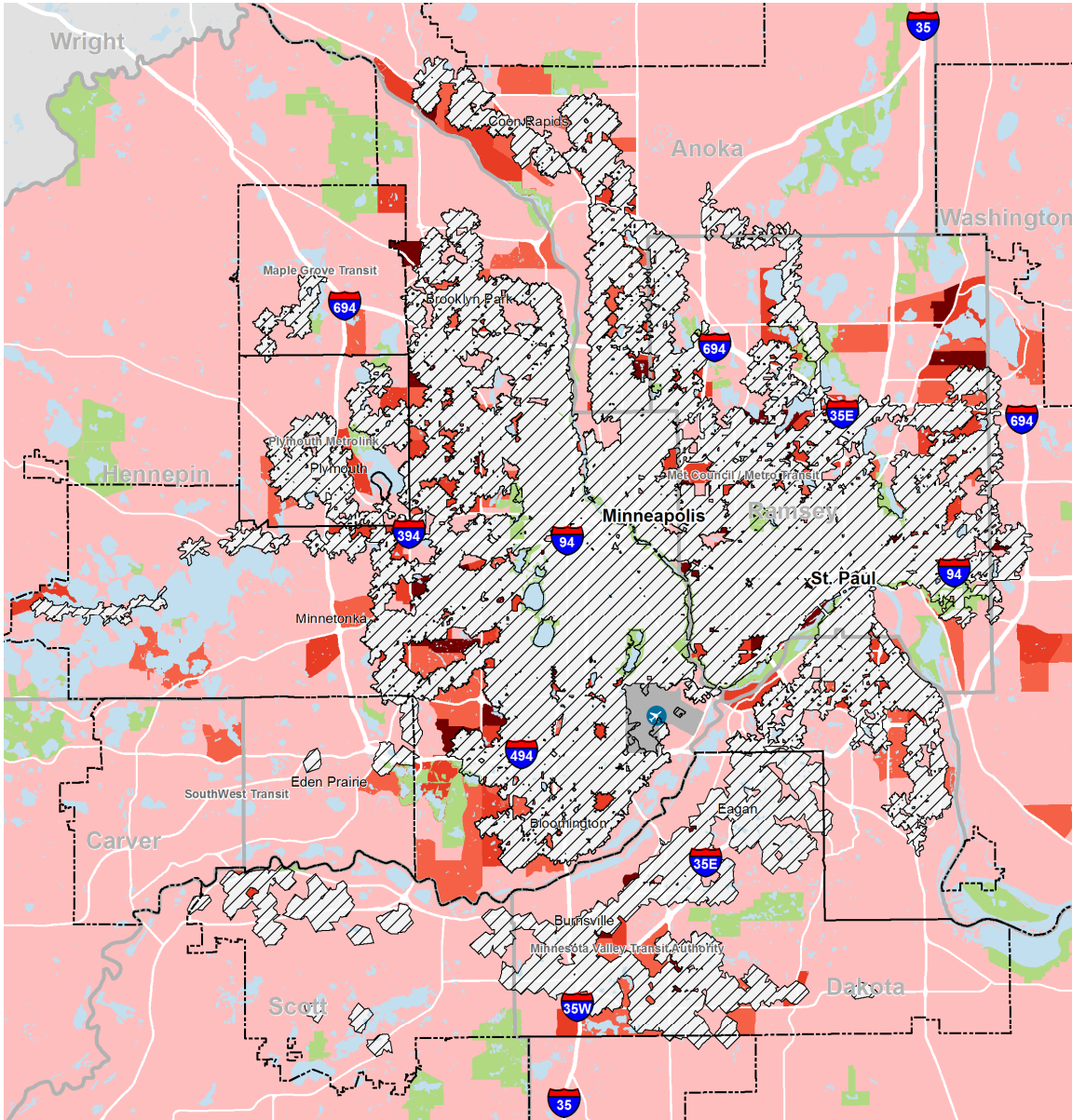
Miles 0 2 4



Source: The Met Council, ACS 2018 5-Year Estimates

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Figure 44 Senior Population Not Served by Basic Transit Network

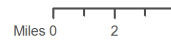


Areas Not Served by Basic Service Network

Senior population per square mile

- Below average
- Average
- Above average
- Much higher than average

- Basic Network 10-Minute (800m) Walkshed
- Transit Authority Service Areas
- County Boundary



Source: The Met Council, ACS 2018 5-Year Estimates

Low-Wage Employment

Geographic Coverage

The average census tract in the region has 531 low-wage jobs per square mile. The strongest concentrations of low-wage employment fall within the highest density areas of Minneapolis and St. Paul, as well as along the I-494 and I-395 corridors. The areas with the highest density are well served by the high frequency transit network. Like total employment, low-wage jobs are well served by the high frequency network in Market Area 1 and by the local network in Market Area 2. Between the local and basic transit networks, nearly all areas with high densities of low-wage employment have all day service.

Areas of Opportunity

Similar to the areas of opportunity for low-income and non-white populations, there are areas within Market Area 1 that have above average densities of low-income jobs that could benefit from increased frequencies to the current local network in St. Paul.

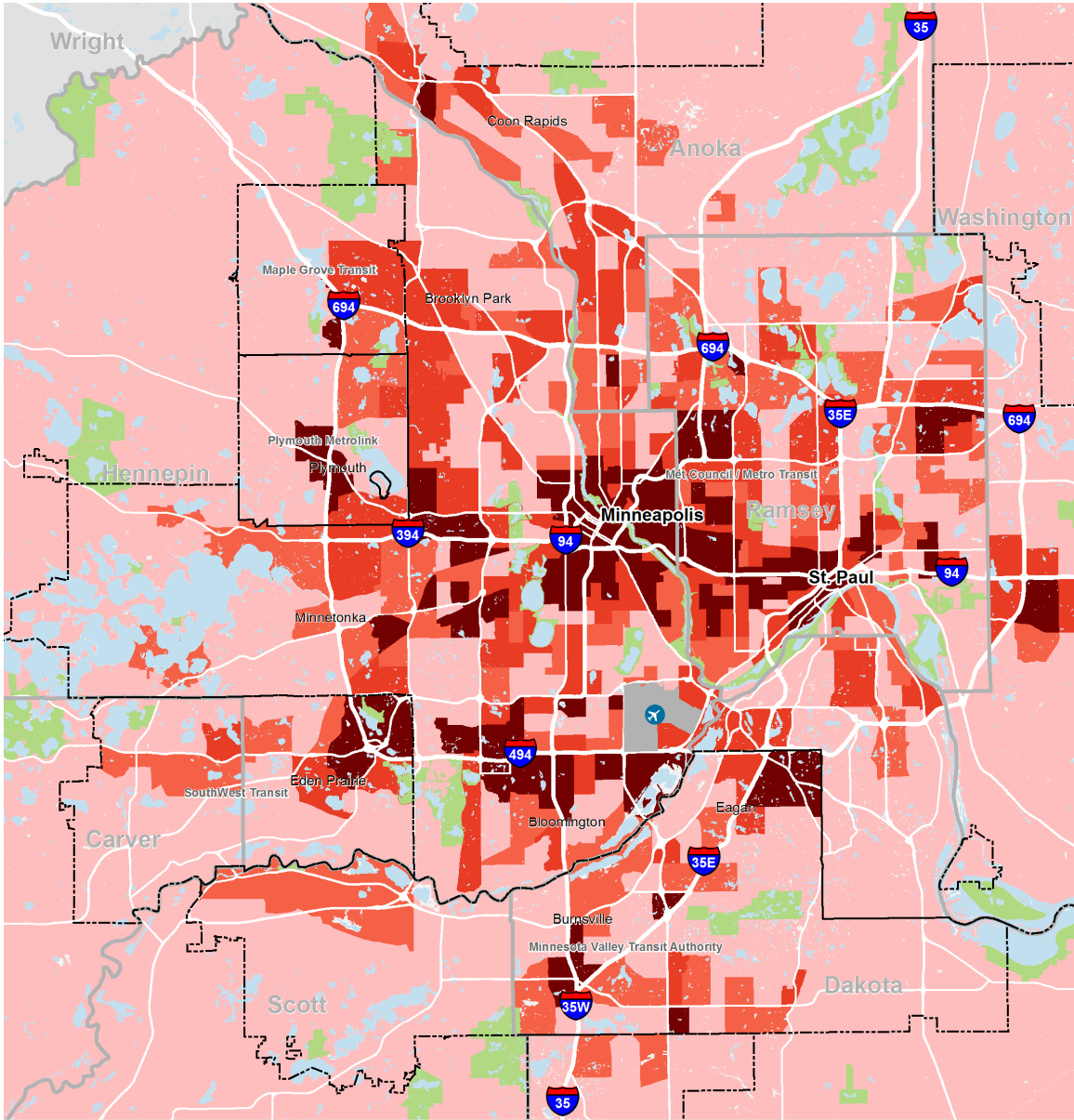
Figure 45 Low-Wage Employment Served by Transit Service Level and Market Area

Service Level	Market Area 1	Market Area 2	Market Area 3	Market Area 4	Market Area 5
High Frequency and High Capacity Transit (<15-min frequency)	79%	24%	2%	0%	0%
Local Service (<30-min frequency)	96%	82%	25%	<1%	0%
Basic Service (>30-min frequency)	96%	83%	43%	14%	1%
Commuter & Express Transit	97%	85%	58%	23%	3%
No Transit Access	3%	15%	42%	77%	97%

Source: The Met Council, 2017 LEHD

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Figure 46 Low-Wage Employment Density



Low-Wage Employment Density

Low-wage jobs per square mile

- Below average
- Average
- Above average
- Much higher than average

- Transit Authority Service Areas
- County Boundary

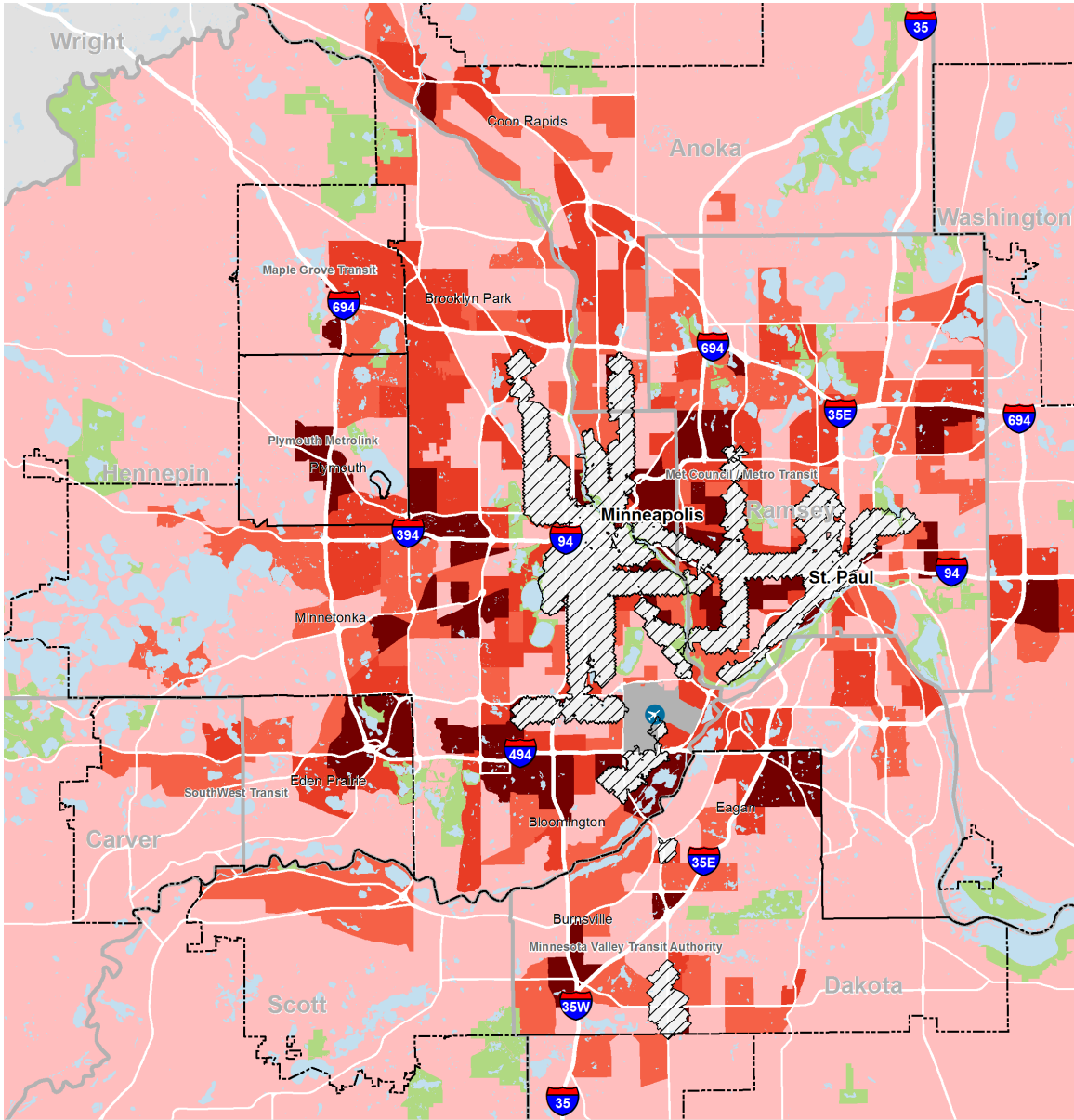
Miles 0 2 4



Source: The Met Council, 2017 LEHD

EXISTING CONDITIONS AND METHODOLOGY MEMO
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Figure 47 Low-Wage Employment Not Served by High Frequency Transit Network



Areas Not Served by High Frequency Service Network

Low-wage jobs per square mile

- Below average
- Average
- Above average
- Much higher than average

- High Frequency Network 10-Minute (800m) Walkshed
- Transit Authority Service Areas
- County Boundary

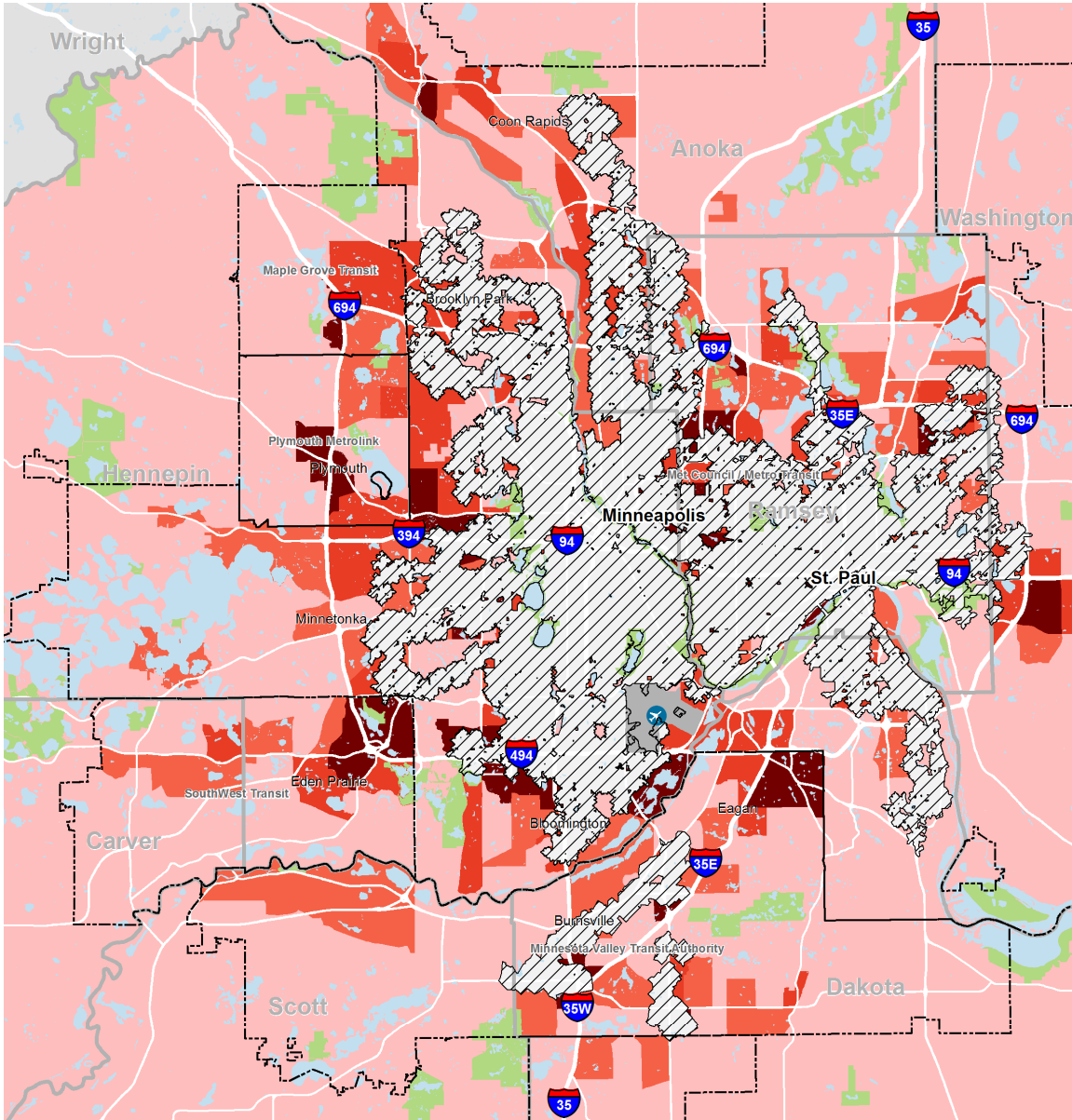
Miles 0 2 4



Source: The Met Council, 2017 LEHD

EXISTING CONDITIONS AND METHODOLOGY MEMO
Metropolitan Council

Figure 48 Low-Wage Employment Not Served by Local Transit Network



Areas Not Served by Local Service Network

Low-wage jobs per square mile

- Below average
- Average
- Above average
- Much higher than average

- Local Network 10-Minute (800m) Walkshed
- Transit Authority Service Areas
- County Boundary

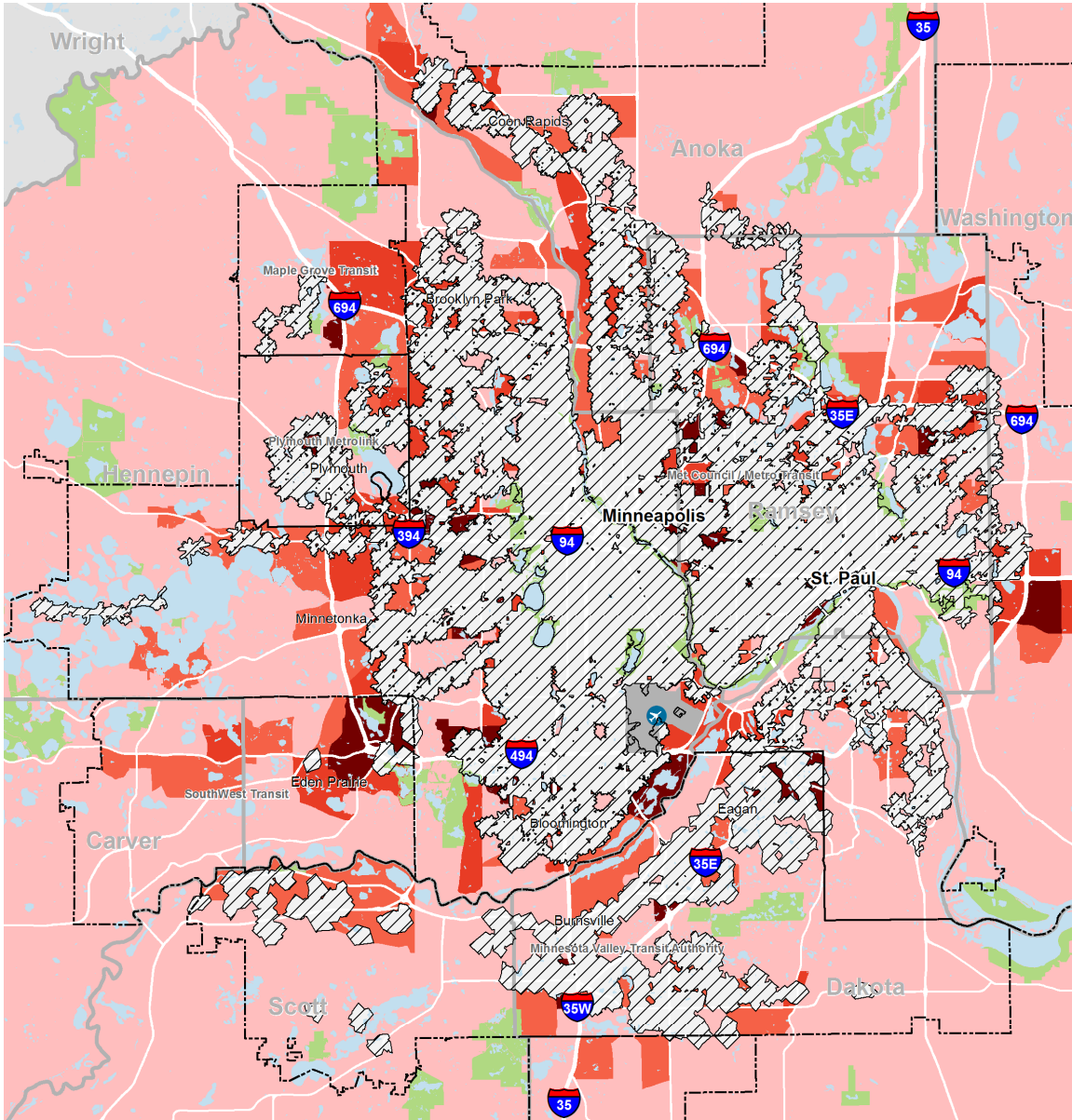
Miles 0 2 4



Source: The Met Council, 2017 LEHD

EXISTING CONDITIONS AND METHODOLOGY MEMO
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Figure 49 Low-Wage Employment Not Served by Basic Transit Network



Areas Not Served by Basic Service Network

Low-wage jobs per square mile

- Below average
- Average
- Above average
- Much higher than average

- Basic Network 10-Minute (800m) Walkshed
- Transit Authority Service Areas
- County Boundary

Miles 0 2 4



Source: The Met Council, 2017 LEHD