

METRO Orange Line Connecting Bus Service Study

Bloomington, Edina, Minneapolis, Richfield
Existing Conditions Report 2019

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1 INTRODUCTION, PURPOSE AND SCOPE

This report provides an evaluation of current transit service provided in the METRO Orange Line Corridor to determine its effectiveness and efficiency. It examines existing conditions and sets the foundation for exploring potential new connecting service with the Orange Line, transit market opportunities and facility needs.

Improvement and expansion of the public transit system is a central element of the Metropolitan Council's 2040 Transportation Policy Plan's (TPP) approach to accommodating the population and employment growth forecast for the region. The TPP calls for development of a network of transitways consisting of bus-only shoulders, high-occupancy vehicle lanes, Bus Rapid Transit (BRT), exclusive busways, Light Rail Transit (LRT) and commuter rail service.

As part of this transitway plan, the Orange Line BRT is scheduled to open in late 2021 between Minneapolis and Burnsville. The 17-mile Orange Line will replace Route 535 Minneapolis – Bloomington with frequent (every 10-15 minutes), all-day service between downtown Minneapolis and Burnsville. Service frequency will be improved most significantly in Bloomington and Burnsville. South of downtown Minneapolis, stations are planned at Lake Street, 46th Street (existing), 66th Street, 76th Street, American Boulevard, 98th Street (South Bloomington Transit Center), and in Burnsville, at Heart of the City and Burnsville Parkway. High-capacity, three-door 60-foot articulated buses will be assigned to the Orange Line. Off-vehicle fare collection, like that on light-rail lines, will be employed to speed up service. Travel time end to end is projected to average 40 minutes, resulting in average speeds over 25 miles per hour.

Ridership models project that a majority of Orange Line riders will transfer from bus or rail service to reach a BRT station, so high-quality connecting bus service will be essential. By 2030, the Orange Line is projected to carry double the weekday rides now carried by Route 535.

SERVICE DAY:	WEEKDAY	SATURDAY	SUNDAY/HOLIDAY
Estimated Rides/Day:	3,000	2,400	1,900
Days /Year:	255	52	58
Estimated Rides/Year:	765,000	124,800	110,200
ANNUAL RIDERSHIP:	1,000,000		

Metro Transit periodically reviews service in a sector or sub-regional area in response to changing travel patterns and significant updates in the transit landscape, such as the opening of a new transitway. The Orange Line Connecting Bus Service Study will revisit transit needs in this study area as well as effectively coordinate local and express bus routes with the new BRT line.

The study area and route map, shown in Figure 1, is bounded by the Mississippi River on the east, I-394 on the north, Highway 169 on the west, and the Minnesota River on the south. The Study Area is urban in the northern half, including downtown Minneapolis, and covering many neighborhoods in south Minneapolis, and suburban in the southern half, covering Bloomington, Edina and Richfield. Although the Orange Line extends to Burnsville, this study will not include areas south of the Minnesota River because this area is served by a separate transit provider, Minnesota Valley Transit Authority (MVTA).

There are 21 bus routes operating in the study area that are likely to complement the Orange Line outside of downtown: Routes 4, 6, 11, 18, 21, 27, 46, 53, 146, 156, 515, 535, 537, 538, 539, 540, 542, 553, 554, 558 and 597. These routes are indicated in bold lines on Figure 1. The routes are included because they connect with the Orange Line at a station, can be modified to connect with the Orange Line at a station, or may have service improvements to enhance the network of routes in the corridor, even without a direct connection.

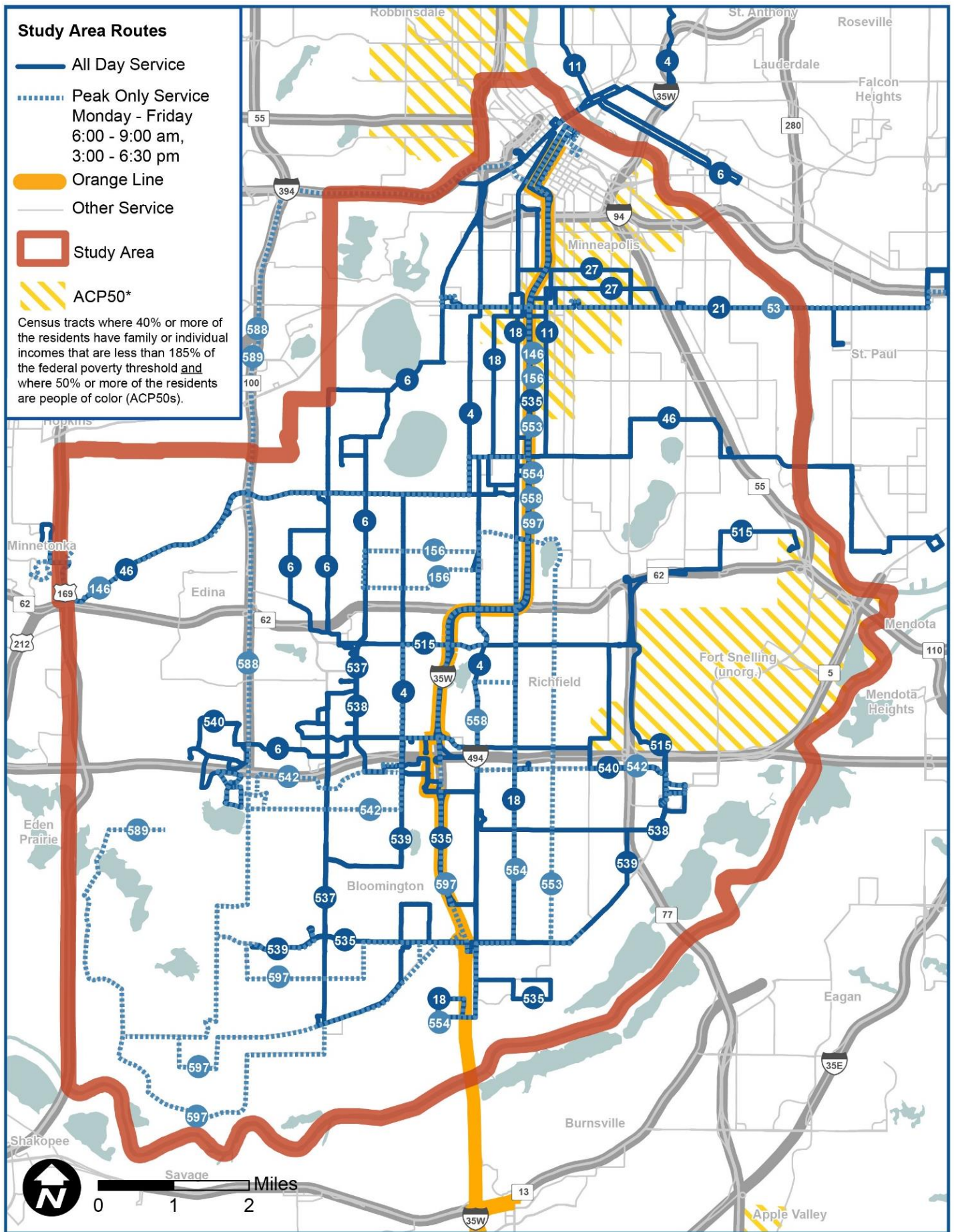
The existing bus routes that may have the most significant changes due to the Orange Line:

- Route 535, because the Orange Line will replace it,
- Route 539, because it will make a direct connection between I-35W and Normandale Community College
- Route 542, because it is best positioned to provide a direct cross-town connection at Knox/American Station for access along the entire corridor south of I-494 in Bloomington.

Several other routes serve the study area but do not provide direct connections to the Orange Line: routes 2, 5, 12, 14, 17, 22, 23, 39, 111, 113, 114, 115, 552 and 579. These routes are not included in the study, but they are included on maps and other materials in the study, as appropriate, for reference.

This report will address the existing conditions of the routes in the study, examining the markets and unmet opportunities that exist for the current transit service being provided. It will also document the development patterns, major attractions and destinations in the study area as well as current and potential future travel patterns. The Orange Line Corridor Transit Service Study will provide a review of the performance and structure of existing transit service and examine the integration and expansion of that transit service to connect with the Orange Line beginning in late 2021.

Figure 1 - Map of the METRO Orange Line Corridor - Existing Bus Service Network and Study Area



2 EXISTING ROUTE STRUCTURE AND FACILITIES

In the Study Area, as in most of the transit network, there are two distinct route structures. The ‘base’ service structure operates throughout the day and is the foundation of the transit network, whereas the ‘peak’ service structure operates as supplemental service during the rush hour periods of Monday thru Friday (6 – 9 a.m. and 3 - 6:30 p.m.).

Base Route Structure

The base route structure in the Study Area is designed to meet a variety of transportation needs. The overall structure is both oriented to downtown St. Paul and/or Minneapolis and a grid of crosstown routes.

Peak Route Structure

During peak hours, the base network remains, often with improved service levels, and is overlaid by additional peak-only commuter routes. Peak-only routes from the southern suburbs and in south Minneapolis offer local pick-up from the neighborhoods, then operate express to/from the University of Minnesota, downtown Minneapolis and St. Paul. These routes operate in addition to base local routes, either on the same street or on close parallel streets. For example, on Nicollet Avenue, Route 18 provides base local service and Route 554 provides peak commuter service.

Off-Street Facilities

Regionally, major off-street transit facilities consist of transit centers and park-and-ride facilities. The METRO Orange Line will serve two park-and-rides in the Study Area : ***Knox Avenue Park & Ride (near 76th/Knox Station)*** and the ***South Bloomington Transit Center (98th Street Station)***. Key off-street facilities are shown in Figure 1. The study will consider how to best integrate park-and-ride services and facilities with the Orange Line and connecting bus routes.

Transit Centers

There are three major transit centers in the suburban part of the Study Area.

- ***South Bloomington Transit Center*** – Located on the east side of I-35W, just south of 98th Street in Bloomington. It is served by routes 18, 465, 535, 539, 554 and 597.
- ***Mall of America Transit Center*** – Located on the east side of the shopping center, just southwest of 24th Ave and East 82nd Street in Bloomington. It is served by routes 5, 54, 415, 444, 495, 515, 538, 539, 540, 542 and the METRO Blue and Red lines.
- ***Southdale Transit Center*** – Located on the northeast corner of the shopping center, just southwest of West 66th Street and York Avenue South in Edina. It is served by routes 6, 515, 537, 538, 578, 579 and SouthWest Flex.

Minneapolis has two BRT stations that are also transit centers:

- ***I-35W and Lake St*** – (under construction) This station, located in the median of I-35W, will be an Orange Line station and be served by existing routes 21, 27, 53, 146, 156, 460, 464, 465, 467, 470, 472, 475, 476, 477, 478, 479, 491, 552, 553, 554, 558, 579 and 597.
- ***I-35W and 46th St*** – (existing) This site will be an Orange Line station served by routes 11, 46, 578, 579, 597.

Park & Ride lots

There are five park-and-ride lots in the Study Area with more than 100 spaces each. Park-and-rides are appropriate in suburban areas, given the current and expected future transit service density and land uses. Sites include:

- ***Fort Snelling Station***– Highway 62 and Minnehaha Avenue South; there are two separate lots, the North Lot and the South Lot. 984 total parking spaces, 2018 usage = 935
- ***28th Avenue Station*** – 28th Avenue South & Lindau Lane; 1,585 parking spaces, 2018 usage = 693
- ***Knox Ave***– West 76th Street & Knox Avenue South in a shared facility with Best Buy; 525 parking spaces (about 200 spaces during 2019-21 construction), usage = 182
- ***Southdale Transit Center*** – West 66th Street & York Avenue South; 161 parking spaces, usage = 57
- ***South Bloomington Transit Center*** – I-35W and West 98th Street; 195 parking spaces, usage = 192

On-Street Facilities

Major on-street transit facilities consist of large shelters with amenities such as benches, lighting and transit information, as well as dedicated right-of-way for transit vehicles.

Transit Shelters

The Study Area has 487 transit shelters, 131 with heat. There are 14 major facilities, defined as locations with more than three all-day routes converging, in the Study Area. All these major locations have shelters. Sites include Marquette/2nd Avenue South, all LRT stations, Uptown Transit Station, I-35W & 46th Street, South Bloomington Transit Center, Normandale College, 76th Street & Newton Avenue and Southdale Transit Center.

Dedicated Transit Right-of-Way

There are segments of dedicated transit right-of-way in the Study Area, in downtown Minneapolis and under I-494. Bus lanes are in place on Marquette and 2nd Avenue South in downtown, the METRO Blue Line is on exclusive right-of-way, and there is a new busway under construction connecting American Boulevard and West 76th Street on the alignment of Knox Avenue which will be used by the METRO Orange Line.

3 REGIONAL TRANSIT DESIGN AND PERFORMANCE STANDARDS

While several factors influence the propensity to use transit, the primary predictor of transit ridership is the density of development at the origin and destination of trips. Transit markets in the Twin Cities region are identified using the Transit Market Index (TMI), which is included in the TPP and calculated using four primary factors: 1) population density, 2) employment density, 3) automobile availability and 4) intersection density/ pedestrian connectivity. The TMI measures the potential market for transit in a certain area. Different types and levels of transit services are appropriate for each transit market area.

The region has five distinct Transit Market Areas, three of which are present within the Study Area in Figure 2, that are determined based on the TMI for a given location and nearby areas. Transit Market Area I, with the highest density of population, employment, and people without access to automobiles, will support the most intensive transit service. Transit Market Area II has high to moderately high population and employment densities, yielding a market area that is conducive to fixed-route transit operations, but not as intensively as in Market Area I. Transit Market Area III has overall lower density and less transit-supportive urban form along with some pockets of denser development. The primary emphasis of transit service in this area is express and commuter service with some suburban local routes and dial-a-ride service providing basic access.

In the Orange Line Connecting Bus Study:

- The area north of 38th Street is in Market Area I
- The area between 38th and 86th streets and east of France Avenue is in Transit Market Area II
- Most of the remainder of the study area south of 86th Street and east of France Avenue lies in Transit Market Area III

Appendix G of the 2040 TPP outlines service design standards for routes based on the market area they serve. The following table shows how they apply to the Transit Market Areas in the Study Area.

METRO Orange Line/I-35W Design and Performance Standards.

The following standards are compiled from the Metropolitan Council Transportation Policy Plan - Appendix G.

Study Area in Minneapolis, Edina, Richfield, Bloomington has Transit Market Areas I, II, III.					Passengers / In-Service Hour (PPISH)+
In TRANSIT MARKET AREA I by ROUTE TYPE:	Minimum Frequency (Minutes)	Service Span/Day	Route Spacing	Stop Spacing	
Core Local Bus	15 Peak, 30 Off-peak	Peak, Off-peak, Nite, Daily	1/2 mile	1/8 to 1/4 mile	20+
Supporting Local Bus	30 Peak, 30 Off-peak	Peak, Off-peak, Nite, Wkdy#	1 mile	1/8 to 1/4 mile	15+
Suburban Local Bus		Peak, Off-peak, Nite, Wkdy#		1/8 to 1/4 mile	10+
Commuter Express Bus	30 Peak	Peak, Off-peak as warranted		Specific*	20+ Peak
					Passengers / In-Service Hour (PPISH)+
In TRANSIT MARKET AREA II by ROUTE TYPE:	Minimum Frequency (Minutes)	Service Span/Day	Route Spacing	Stop Spacing	
Core Local Bus	30 Peak, 60 Off-peak	Peak, Off-peak, Nite, Daily	1 mile	1/8 to 1/4 mile	20+
Supporting Local Bus	30 Peak, 60 Off-peak	Peak, Off-peak, Nite, Wkdy#	1 to 2 mile	1/8 to 1/4 mile	15+
Suburban Local Bus	30 Peak, 60 Off-peak	Peak, Off-peak, Nite, Wkdy#	2 miles	1/8 to 1/4 mile	10+
Commuter Express Bus	30 Peak	Peak, Off-peak as warranted		Specific*	20+ Peak
					Passengers / In-Service Hour (PPISH)+
In TRANSIT MARKET AREA III by ROUTE TYPE:	Minimum Frequency (Minutes)	Service Span/Day	Route Spacing	Stop Spacing	
Core Local Bus	60 Peak, 60 Off-peak	Peak, Off-peak, Nite, Daily	Specific **	1/8 to 1/4 mile	20+
Supporting Local Bus	60 Peak, 60 Off-peak	Peak, Off-peak, Nite, Wkdy#	Specific **	1/8 to 1/4 mile	15+
Suburban Local Bus	60 Peak, 60 Off-peak	Peak, Off-peak, Nite, Wkdy#	Specific **	1/8 to 1/4 mile	10+
Commuter Express Bus	3 trips per peak	Peak, Off-peak as warranted		Specific*	20+ Peak
Information Source:	Table G-6	Table G-5	Table G-4	Table G-3	Table G-9

Peak - 6:00 am to 9:00 am and 3:00 pm to 6:30 pm; Midday - 9:00 am to 3:00 pm; and 6:30 pm to 10:00 pm,

Nite - about 10:00 pm to 1:30 am

Service Span #, Supporting Local service may be more limited on weekends.

Suburban Local weekend service more limited, provided as warranted.

Specific Stop Spacing*, since in downtown and local pick up areas, local standards apply, but non-stop segments, stop spacing can be much greater.

Passengers / In-Service Hour+ minimums listed are for the entire route. Individual hours may fall below the standard.

Specific Route Spacing **, variable by area due to geography, land use, demographics.

4 STUDY AREA ROUTE COVERAGE AND LEVEL OF SERVICE

There are 21 bus routes operating in the study area that are likely to complement the Orange Line outside of downtown: Routes 4, 6, 11, 18, 21, 27, 46, 53, 146, 156, 515, 535, 537, 538, 539, 540, 542, 553, 554, 558 and 597. These routes are indicated in bold lines on Figure 1. The routes are included because they connect with the Orange Line at a station, can be modified to connect with the Orange Line at a station, or may have service improvements to enhance the network of routes in the corridor, even without a direct connection. There are other routes in the study area that are not included in the study. The routes mapped with bold lines on Figure 1 are discussed below.

Route coverage and hours of service in the Study Area on weekdays generally meet service standards defined in the 2040 TPP Appendix G, summarized on the previous page, with a few exceptions. Routes 6, 11, 18, 21 and 515 are included in Metro Transit's High Frequency Network. During peak periods local coverage is very good and time-saving commuter express, or limited stop, routes overlay or closely parallel local routes. In the middle of the day, coverage is essentially the same as during peak periods in most of the area north of American Boulevard and east of France Avenue but is more limited in the areas south of American Boulevard and west of France Avenue. Lyndale Avenue South and Penn Avenue South between 90th and 98th Street in Bloomington has no off-peak service. Most urban routes except Route 18 on Grand Avenue operate into the evening.

On weekends, coverage provided by local lines in the Study Area's urban northern section is the same as on weekdays. However, there is less coverage in the suburban southern areas on Saturdays. Coverage is less on Sunday evenings than during Saturday evenings, leaving longer gaps in some areas.

Core Local Routes

Route 4 has two main branches in the study area-one via Bryant/Lyndale and one via Penn Avenue. Most trips will serve the Orange Line American Boulevard station near Southtown Mall. On Sunday, the route meets standard minimum service, but only operates every 30 minutes on Lyndale Avenue in an area where parallel lines are operating every 10 or 15 minutes.

Route 6 has two main branches in the study area-one via France Ave and one via Xerxes Ave. Half of Route 6 will be replaced by METRO E Line Arterial BRT, scheduled to open in 2023. Route 6 is part of Metro Transit's High Frequency Network between Hennepin Avenue and 36th Street and 1st Street - Downtown.

Route 11 operates just east of I-35W in south Minneapolis on 4th Avenue South and most trips serve the Orange Line 46th Street Station. Route 11 is part of Metro Transit's High Frequency Network between 46th Street and Grand Street and 29th Avenue NE. The route could easily provide added rides to Orange Line via transfers.

Route 18 service is just west of I-35W on Nicollet Avenue, although select trips do serve Grand Avenue between 31st and 48th streets instead. The route is two blocks west from the Orange Line 46th Street Station and directly serves at the Orange Line 98th Street Station. It provides the only overnight service in the Study Area via Nicollet Ave north of 48th Street, with hourly service between 1 a.m. and 5 a.m. Route 18 is part of Metro Transit's High Frequency Network between Nicollet Avenue and 66th Street and Downtown. Route 18 could provide added rides to Orange Line via transfers.

Exception: Service on the Grand Avenue branch does not meet Transit Market Area I frequency or span standards since it is every 60 minutes and generally does not operate after 7 p.m. (10 p.m. southbound on weekdays). However, Route 135 also serves Grand Avenue, providing limited stop service during rush hour.

Route 21 operates as a crosstown route between Uptown and downtown St. Paul via Lake Street in Minneapolis and Marshall/Selby Avenue in St. Paul. Route 21 is part of Metro Transit's High Frequency Network between Uptown and Marshall Ave at Cretin Avenue in St. Paul. The route will serve the Orange Line Lake Street station, also connects with METRO Blue Line at Hiawatha and Lake Street, A Line and Green Line at Snelling Ave. Much of Route 21 will be replaced by METRO B Line BRT, scheduled to open in 2022. The route could easily provide added rides to Orange Line via transfers.

Route 535 provides all-day weekday service along I-35W, making stops at future Orange Line stations at Lake Street, 46th Street and 66th Street. This route will to be replaced largely by the Orange Line. It currently does not operate on weekends, although the Orange Line will do so. Route 535 provides local service to key destinations that won't be served by the Orange Line including VEAP on Lyndale Avenue, sections of Penn Avenue and Normandale Community College. Local connecting buses will be required to connect the Orange Line with these destinations.

Supporting Local Routes

Route 27 connects employees working in the Midtown area at Wells Fargo Home Mortgage and Allina hospitals with the Blue Line at Hiawatha and Lake Street. Before I-35W construction began, the route also connected at I-35W and Lake St. Route 27 could easily provide added rides to Orange Line via transfers at the new I-35W and Lake Street Station.

Route 46 is a crosstown route between Edina, 46th and 50th streets in south Minneapolis and St. Paul. The route will serve the Orange Line I-35W & 46th Street station, also connects with METRO Blue Line and A lines at 46th Street Station. Route 46 could easily provide added rides to Orange Line via transfers.

Suburban Local Routes

Route 515 is a crosstown route serving 66th Street between Mall of America and Southdale. Some trips serve the VA Medical Center. Route 515 is part of Metro Transit's High Frequency Network between Southdale and Bloomington Avenue and could easily provide added rides to Orange Line via transfers.

Route 537 travels along France Ave between Southdale Transit Center, Normandale Community College and France Avenue/Old Shakopee Road on weekdays only.

Route 538 is a crosstown route serving 86th Street, Lyndale Avenue, 82nd Street, Knox Avenue, American Boulevard, Xerxes Avenue, 76th Street and York Avenue between Mall of America and Southdale. Rush hour trips serve Best Buy Headquarters on Penn Avenue at 76th Street. Service is limited during off-peak hours at the minimum 60-minute frequency, but route could provide some added rides to Orange Line via transfers.

Route 539 is a crosstown route serving 24th Avenue South, 86th Street, Cedar Avenue, Old Shakopee Road, 98th Street, Normandale Community College, France Avenue, 90th Street, Penn Avenue between Mall of America and Best Buy Headquarters on 76th Street. Limited service extends to Normandale Village and the neighboring apartment complexes near Normandale Boulevard. The route could easily provide added rides to Orange Line via transfers.

Route 540 is a crosstown route serving 24th Avenue South, American Boulevard, 12th Avenue, 77th Street, 76th Street, Best Buy Headquarters, Minnesota Drive, Edina Industrial Park, East Bush Lake Road between Mall of America and on weekdays, Normandale Lake Area of Bloomington. Route 540 could provide added rides to Orange Line via transfers daily at 76th Street.

Route 542 travels on American Boulevard. An exception in Transit Market Area II, route has minimal service during the midday, with no night or weekend service. Service ends by 6:30 p.m., leaving the retail centers and hotels along the

route with no service for their evening or weekend shifts. The route could add rides to Orange Line via transfers at Knox Avenue and American Boulevard.

Commuter and Express Routes

Route 53 provides limited-stop service to downtown St. Paul for commuters living along Lake Street, Marshall Avenue, and Snelling Avenue. It provides a faster alternative to Route 21.

There are several express routes that operate non-stop on I-35W. Most of these routes serve commuters for the 7 through 9 a.m. work start times and the 3:30 through 5:30 or 6 p.m. work end times in downtown Minneapolis. Travel times per trip via I-35W are 5 to 12 minutes faster than via the local alternatives.

- **Route 135** provides limited-stop service to downtown St. Minneapolis along W 48th Street, Grand Avenue, 31st Street and 1st Avenue South/Blaisdell Avenue. Alternate service is provided by Route 18G, mainly during off-peak hours.
- **Route 146** provides limited-stop service to downtown Minneapolis along W 50th and 46th streets. Alternate service via Route 46 transfers with Orange Line take 5-10 minutes longer.
- **Route 156** provides express service between W 60th and 56th streets – east of Xerxes Avenue and downtown Minneapolis via I-35W north of Diamond Lake Road.
- **Routes 552, 553, 554 and 558** provides express service between Bloomington – Richfield and downtown Minneapolis via I-35W north of Diamond Lake Road.
- **Route 578 and 579** are express routes via Southdale Park & Ride, Highway 62 and I-35W. Route 578 serves downtown Minneapolis and Route 579 serves the U of M. Routes will serve the Orange Line 46th Street Station and could add rides to Orange Line via transfers there.
- **Route 588** provides limited express service via I-394 and Highway 100 for commuters traveling from downtown Minneapolis to the businesses in the Normandale Lake Area of Bloomington. Alternatively, Route 542 could serve these commuters via transfers with the Orange Line.
- **Route 589** provides limited express service via Highway 100 and I-394 for residents of western Bloomington commuting to downtown Minneapolis.
- **Route 597** provides express service from southwestern Bloomington via I-35W between 98th Street/South Bloomington Transit Center and downtown Minneapolis. Travel times between 98th Street - downtown Minneapolis are about 20 minutes vs. a projected 27 minutes via the Orange Line.

Figure 2 - Map of the METRO Orange Line Corridor's Transit Market Areas

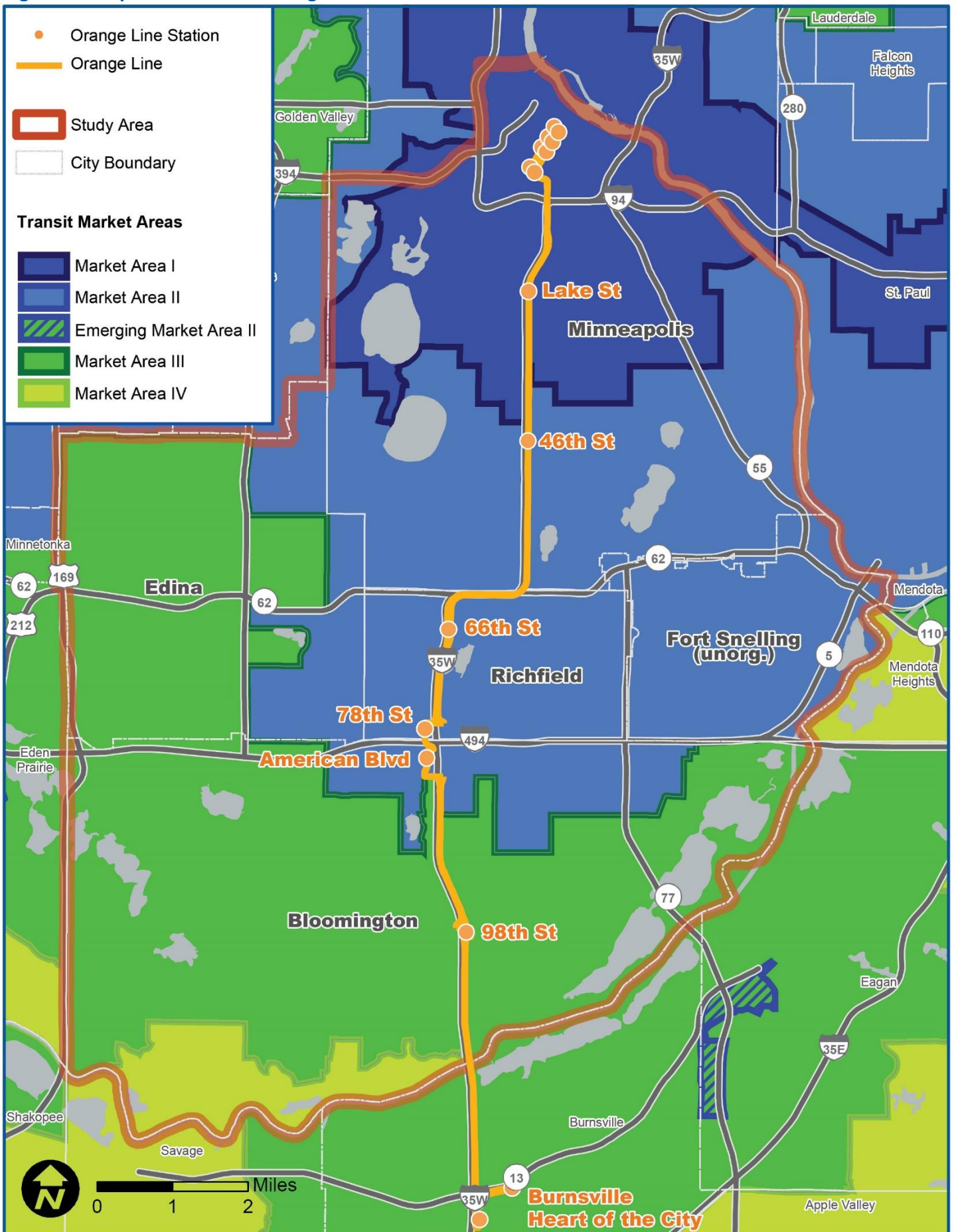


Figure 3 – Table of Service Frequencies

The trunk service frequencies for Study Area routes are summarized in the following table.

FREQUENCIES

Route	AM Peak	Midday	PM Peak	Evening	Owl	Saturday	Saturday Evening	Sunday	Sunday Evening
4	6-10	15	8-10	15-30	4 trips	15	15-30	30	30
6	5-12	10	5-10	15	4 trips	15	15	15	15-20
11	15	15	15	20-30	3 trips	15	30	30	30-40
18	7-8	7-8	6-8	12	60	7-8	10-15	10	15
21	8-15	6-10	6-8	10	5 trips	7-8	10-15	10	15
27	30	30	30	na	na	na	na	na	na
46	15-20	30	20	30-60	na	30	60	30	2 trips
53	15-30	na	15-30	na	na	na	na	na	na
135	15-30	na	30	na	na	na	na	na	na
146	15-20	na	15-30	na	na	na	na	na	na
156	15-20	na	15-20	na	na	na	na	na	na
515	15	15	15	20	na	15	20	20	30
535	10-15	15	10-15	30	na	na	na	na	na
537	60	60	60	na	na	na	na	na	na
538	30	30-60	30	30-60	na	30-60	na	30-60	na
539	30	30	30	60	na	60	60	60	na
540	20	30	20	60	na	60	60	60	60
542	30	4 trips	30	na	na	na	na	na	na
553	30	na	30	na	na	na	na	na	na
554	15-30	na	15-30	na	na	na	na	na	na
558	30	na	30	na	na	na	na	na	na
588	2 trips	na	3 trips	na	na	na	na	na	na
589	30-40	na	30-40	na	na	na	na	na	na
597	15-30	na	15-30	na	na	na	na	na	na
21 routes	7-9am	9am-3pm	3-6pm	7-11pm	12-5am	9am-3pm	7-11pm	9am-3pm	7-11pm

Speed and Reliability

Bus service speed and reliability are affected by roadway characteristics and the spacing of bus stops, to name just two factors. There are nearly 2,100 bus stops on the 24 study routes. The bus stop spacing standard applicable for the Study Area calls for six to eight stops per mile on local routes. Route segments that exceed the standard are scattered over more than 10 different corridors, as shown on Figure 6. Metro Transit is working to improve route speed and reliability by reviewing and possibly consolidating bus stops along local routes to achieve an average spacing closer to four to six stops per mile. Very frequent stop spacing persists on some streets to compensate for the access problems caused by a lack of sidewalks on both sides of streets. This factor no longer applies on West 84th Street in Bloomington, for example, so stop consolidations would now be possible there. A complete review of such possibilities will be made with the Concept Plan.

Bus service speeds and travel times are affected by several other factors besides the location and spacing of bus stops. Factors such as chronic slow traffic and frequent red lights will slow down buses. Transit advantages such as bus-only lanes, queue jumps and ramp-meter bypasses will result in higher bus speeds. Transit Signal Priority and shifting bus stop locations to take advantage of favorable traffic signal progression are also being pursued to raise average speeds on local bus routes.

Local buses and express buses operate at significantly different speeds and provide different travel times. For example, typical travel times from 98th Street in Bloomington to downtown Minneapolis on local Route 18 vary from approximately 53 minutes in the midday to approximately 62 minutes in the PM peak. In contrast, the average speed on express Route 597 travel time between these same locations takes about 26 minutes, reflecting the routing of buses via I-35W. Crosstown travel times vary, based on distances and any transfers.

Figure 4 – TABLE OF TRAVEL TIMES BETWEEN SELECT CORRIDOR POINTS AND DOWNTOWN MINNEAPOLIS

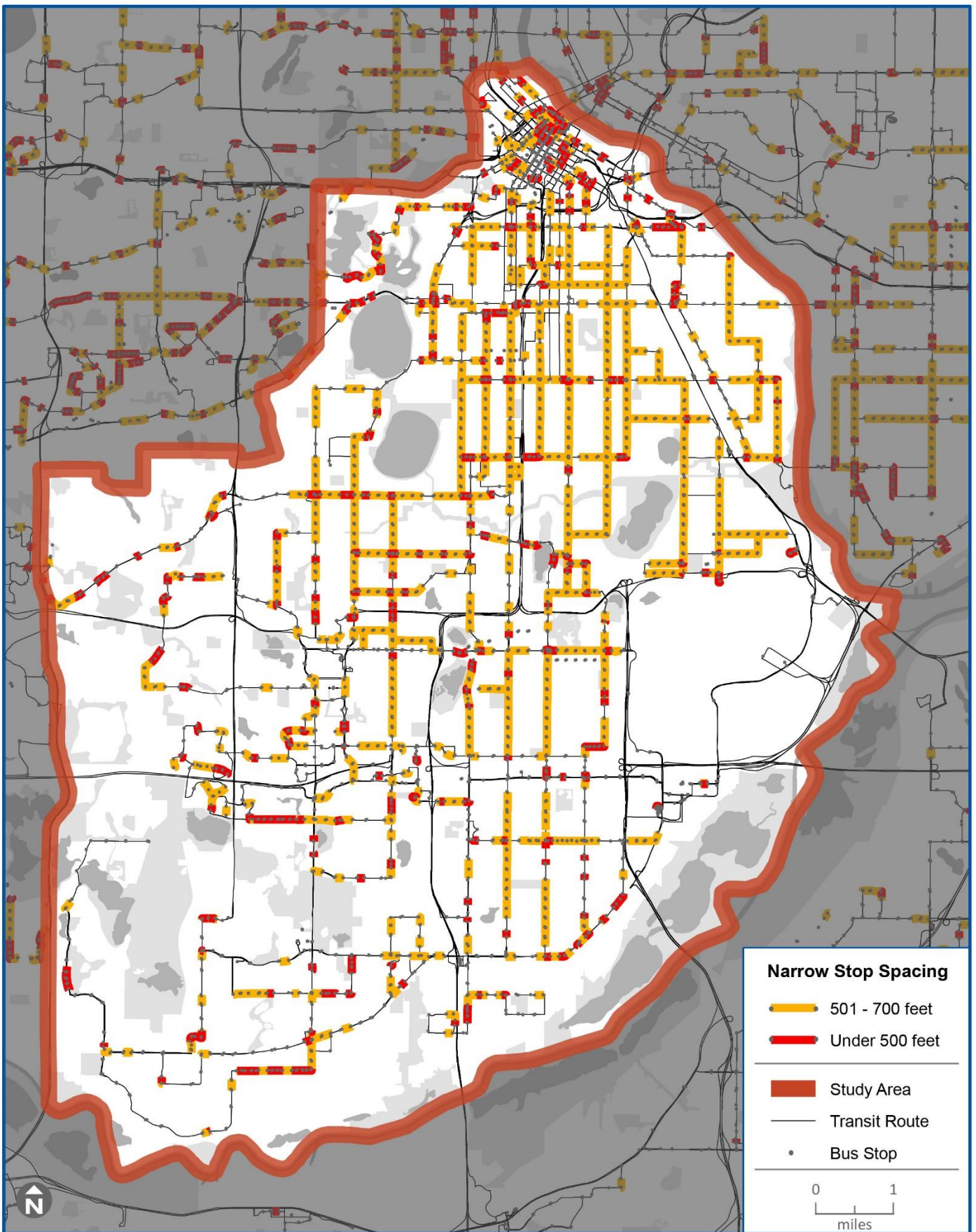
Service Day	Time Frame of Day	Selected From Location	Selected To Location	Travel Via Route(s)	Typical Time in Minutes
Weekday	AM Peak Hour	I-35W & 46th St	2nd Ave S & 7th St	535	17
	Midday	I-35W & 46th St	2nd Ave S & 7th St	535	19
Sat/Sunday	Midday	I-35W & 46th St	Nicollet & 7th St	11	26
Weekday	AM Peak Hour	76th St & Best Buy, Inc	2nd Ave S & 7th St	535	32
	Midday	76th St & Best Buy, Inc	2nd Ave S & 7th St	535	26
Sat/Sunday	Midday	76th St & Best Buy, Inc	Nicollet & 7th St	4	44
Weekday	AM Peak Hour	South Bloomington TC	2nd Ave S & 7th St	597	26
	Midday	South Bloomington TC	2nd Ave S & 7th St	535	38
Sat/Sunday	Midday	South Bloomington TC	Nicollet & 7th St	18	53
Weekday	AM Peak Hour	Normandale College	2nd Ave S & 7th St	535	54
	Midday	Normandale College	2nd Ave S & 7th St	535	46
Sat/Sunday	Midday	Normandale College	Nicollet & 7th St	539, 4	59

Figure 5 – TABLE OF TRAVEL TIMES BETWEEN CORRIDOR POINTS - CROSSTOWN

Service Day	Time Frame of Day	Selected From Location	Selected To Location	Travel Via Route(s)	Typical Time in Minutes
Weekday	AM Peak Hour	I-35W & 46th St	Vernon Av & Hwy 100	46	17
	Midday	I-35W & 46th St	Vernon & Hwy 100	46	18
Sat/Sunday	Midday	I-35W & 46th St	Vernon & Hwy 100	46	17
Weekday	AM Peak Hour	Southdale - Edina	VA Medical Center	515	28
Saturday	Midday	Southdale - Edina	VA Medical Center	515	29
Sunday	Midday	Southdale - Edina	VA Medical Center	515, Blue L	55
Weekday	AM Peak Hour	76th St & Best Buy, Inc	Edina Industrial Park	540	17
	Midday	76th St & Best Buy, Inc	Edina Industrial Park	540	15
Sat/Sunday	Midday	76th St & Best Buy, Inc	Edina Industrial Park	540	12
Weekday	AM Peak Hour	76th St & Best Buy, Inc	MSP Airport	540, Blue L	40
	Midday	76th St & Best Buy, Inc	MSP Airport	540, Blue L	36
Sat/Sunday	Midday	76th St & Best Buy, Inc	MSP Airport	540, Blue L	36
Weekday	AM Peak Hour	Normandale Village	MSP Airport	539, Blue L	51
	Midday	Normandale Village	MSP Airport	539, Blue L	54
Sat/Sunday	Midday	Normandale Village	MSP Airport	539, Blue L	54

Travel times are derived from August 2018 Schedules

Figure 6 – Route Segments with over Eight Bus Stops per Mile or on Average Under 500 Feet Apart



5 ANALYSIS OF EXISTING RIDERSHIP AND ROUTE PERFORMANCE

Data Collection and Analysis

Metro Transit buses provide reliable and comprehensive bus stop-level passenger data as average daily on and off counts at individual bus stops. Data used for this report is from September-November 2018, with one exception: Route 535 ridership is from Fall 2017 due to the start of major construction on I-35W in June 2018.

Route Performance

Individual Route Ridership and Performance

Figures 7, 8 and 9 summarize service performance for each of the routes in the study area by service day. The key statistics are found in the columns in these figures. They are defined as follows:

In-Service Hours is the amount of transit available for passengers to use, defined as the total of all the time required for all trips to cover the distance from terminal to terminal over a period, usually within a 24-hour day.

Platform Hours defines the total cost of providing a transit service, measured by the total time that all transit vehicles require to travel from the operating base, provide all the In-Service Hours, take recovery time at the end of each Revenue Trip, then return to the operating base.

Peak Vehicles are another measure of the cost of service, derived from the length of the Revenue Trips, plus the recovery time at each terminal divided by the frequency of service. The more frequent the peak service is provided, the more Peak Vehicles will be needed. Peak buses account for most of the transit system's operating costs.

Passengers per In-service Hour, or PPISH is the most commonly used measure of route performance. This statistic is derived by dividing the average number of Passenger "Boardings" by the In-service Hours. Transit service in the Twin Cities has generally been operating sustainably, and at acceptable subsidy levels, if PPISH for each service is at least at the levels listed in the following table:

The Metropolitan Council's Transportation Policy Plan Appendix G lists these thresholds for productivity by route type:

Route Category:	Minimum Passengers per In-Service Hour (PPISH)
Core Local Bus	20
Supporting Local Bus	15
Suburban Local Bus	10
Commuter Express Bus (includes Limited Stop Buses)	20

Overall Ridership and Performance

- Weekday: 1,456 in-service hours are provided on 21 routes in the study area. Weekday ridership averages 25,481 for an average of 31.9 passengers per in-service hour or PPISH.
- Saturday: 914 in-service hours are operated in the study area on ten routes. Saturday ridership averages 25,481 for an average of 27.9 passengers per in-service hour or PPISH.
- Sunday: 668 in-service hours are operated in the Study Area on ten routes. Sunday ridership averages 18,279. For an average of 27.4 passengers per in-service Hour or PPISH.

The In-Service Hours and Passengers per In-Service Hours are calculated for the entire route and not just for the route segment within the Study Area.

Figure 7 - WEEKDAY SERVICE PERFORMANCE

Route Type	Route #	In-Service Hours	Platform Hours	Daily			Average Speed MPH	Boardings	PPISH
				Revenue Trips	Peak Vehicles				
Local	4	178.0	240.1	161	20	13.2	5,355	30.1	
	6	216.3	297.8	221	20	11.9	7,926	36.7	
	11	131.1	168.6	133	11	11.2	4,069	31.1	
	18	204.2	278.1	268	19	11.9	9,006	44.1	
	21	234.6	311.0	258	22	9.7	10,757	45.9	
	27	11.0	16.5	60	1	14.1	91	8.3	
	46	60.9	85.3	78	6	15.4	1,069	17.6	
	515	63.7	95.3	135	6	16.4	1,412	22.2	
	537	6.0	11.9	22	1	17.7	76	12.8	
	538	30.0	41.2	49	3	13.8	363	12.1	
	539	52.5	69.1	59	5	18.0	853	16.3	
	540	38.9	60.9	70	6	17.0	690	17.7	
	542	15.6	25.5	29	3	16.3	206	13.2	
Local Sub-totals		1,242.7	1,701.1	1,543	123		41,873		
Express									
	53	15.0	21.6	16	4	12.6	709	47.4	
	135	7.9	16.1	14	3	10.6	292	36.8	
	146	15.6	27.5	18	5	12.9	335	21.5	
	156	19.1	31.3	22	5	12.9	457	24.0	
	535	88.1	125.6	121	10	18.9	1,470	16.7	
	553	10.9	20.2	13	4	15.3	190	17.5	
	554	13.9	22.9	15	3	15.5	275	19.8	
	558	12.4	20.9	13	4	14.0	158	12.8	
	588	3.2	5.3	5	1	23.0	37	11.4	
	589	8.8	13.0	8	2	21.8	185	20.9	
	597	18.7	33.3	24	5	21.4	490	26.2	
Express Sub-total		213.4	337.7	269	46		4,597		
Weekday Total		1,456.2	2,038.8	1,812	169		46,470		
Boardings are September-October-November 2018 Daily Farebox Count Averages									
PPISH: Passengers per In-Service Hour									

Figure 8 - SATURDAY SERVICE PERFORMANCE

Route Type	Route #	In-Service Hours	Platform Hours	Daily		Ave. Speed MPH	Boardings	PPISH
				Revenue Trips	Peak Vehicles			
Local	4	133.0	179.6	118	12	13.9	2,808	21.1
	6	142.0	190.4	147	11	12.5	3,810	26.8
	11	107.15	135.7	117	9	12.0	2,218	20.7
	18	173.1	226.1	240	15	11.8	6,152	35.5
	21	205.3	270.0	230	19	10.2	8,050	39.2
	46	43.6	55.9	56	4	16.0	484	11.1
	515	50.4	74.6	113	5	17.0	1,114	21.7
	538	21.9	28.0	35	2	13.7	207	9.5
	539	26.5	33.5	32	2	18.2	344	13.0
	540	11.4	16.1	28	1	18.1	293	25.7
Saturday Total		914.3	1,209.9	1,116	80		25,481	

Boardings are September-October-November 2018 Daily Farebox Count Averages
PPISH: Passengers per In-Service Hour

Figure 9 - SUNDAY SERVICE PERFORMANCE

Route Type	Route #	In-Service Hours	Platform Hours	Daily		Ave. Speed MPH	Boardings	PPISH
				Revenue Trips	Peak Vehicles			
Local	4	94.2	127.7	85	7	14.3	1,822	19.4
	6	122.2	166.3	134	11	13.3	2,902	23.7
	11	64.38	84.33	69	5	12.8	1,281	19.9
	18	128.2	172.5	183	12	12.5	4,852	37.8
	21	144.6	194.1	174	13	10.3	5,734	39.6
	46	32.2	44.4	42	4	16.6	302	9.4
	515	33.9	56.1	77	4	17.0	753	22.2
	538	17.5	22.8	28	2	13.7	172	9.8
	539	19.8	25.5	24	2	18.4	213	10.8
	540	10.8	15.6	27	1	18.6	248	23.1
Sunday Total		667.7	909.3	843	61		18,279	

Boardings are September-October-November 2018 Daily Farebox Count Averages
PPISH: Passengers per In-Service Hour

Many of the lower performing routes will have direct connections with the Orange Line, which should increase their performance. Route 27 lost half of its riders when the I-35W & Lake Street stop closed but it will connect again on westbound Lake Street at the new station. Route 46 connecting at 46th Street, Route 540 at 76th Street, Routes 538 and 542 at American Boulevard and Route 539 connecting at 98th Street/South Bloomington Transit Center should all play a key role in connecting passengers with the Orange Line.

Transfer Analysis

In addition to stop level data, analyzing transfers between routes by customers using Go-To Card fare cards are helpful to understand the role of Route 535 service on I-35W, just as the METRO Orange Line will operate in the future. About 80% of Route 535 riders use Go-To Cards. There are about 250 transfers a day to Route 535 using a Go-To Card. When this is pro-rated to reflect all Route 535 riders there are about 300 transfers per day, which represents about 20% of the route's total boardings.

The ridership forecast mode of access estimates that most Orange Line riders are expected to transfer to or from the route, which indicates there will be a significant increase in transfer activity in the future. Currently the busiest transfer locations outside downtown are at 46th Street, 76th Street and 98th Street. The relative importance of the major transfer points in this corridor with the introduction of the Orange Line may not shift much initially, with exception that more riders will likely transfer at Lake Street than at 46th Street. It is likely that about half of transfer activity now at 76th Street will relocate to American Boulevard, resulting in parity of these two stops.

Route 535 on weekdays exhibits these transfer patterns:

- High transfer activity occurs in Downtown Minneapolis with over 50% of the daily transfers.
- Medium transfer activity is found at 46th Street and at 76th Street. Each of these points generates over 10% of the daily transfers.
- Lower transfer activity occurs at Lake Street, 66th Street, and 98th Street – South Bloomington Transit Center. These each generate under 10% of the daily transfers.

The Lake St. transfer point was closed in 2018 for I-35W construction, but activity at that location was diminished by the very poor-quality bus stop and access there. There is reason to expect that ridership and transfer activity will increase at Lake Street when the new station opens with the opening of the Orange Line to the point that it joins the medium transfer activity category.

6 SIGNIFICANT ORIGINS AND DESTINATIONS IN STUDY AREA

An analysis of data accumulated through cell phone and other GPS transmissions during September-November 2018 indicates the most common travel patterns in the Study Area, regardless of mode, and allows for comparison of these travel patterns with the area's transit network. The data shows travel is very dispersed in the study area, as it is generally in the region. Please note that the data reflects in-route stops as separate trip, which may overestimate patterns within a single zone. For example, a commuter who stops on the way to work for coffee will be counted as making two separate trips.

Even so, there are some significant travel patterns evident in the METRO Orange Line Study Area. The top three pairs, each with at least 20% of the trips each, indicate high volumes going between points just north and south of I-494, between Bloomington and Richfield and between South Minneapolis near Lake Street and Downtown Minneapolis.

Figure 10 shows the travel patterns between the zones in the study area and a map of the major Origins and Destinations by zone is in the Appendix.

The areas with the highest percentages of trips between them may have the best potential for frequent transit service connecting them. The existing transit system does a good job of serving the Downtown Minneapolis – Lake Street subareas, and the areas near 46th Street and in Richfield. There is less north-south transit service connecting Bloomington and Richfield, so there may be potential to link zones immediately north and south of I-494 with better north-south bus service. This improvement would complement the existing east-west cross-town lines. The high percentage of trips that travel between areas north and south of the Minnesota River is reflected in existing connections between MVTA routes and other service at Mall of America and at I-35W and 98th Street.

Figure 10 – Major Origins/Destinations Subareas

Subareas To: From (below):	1- Mpls Downtown	2- Lake St South Mpls	3- 46th St South Mpls	4- 66/76th St, Richfield	5- American, Bloomington	6- 98th St, South Bloom.	7- MSP Inter. Airport	8- MOA, South Loop, Bloom.	9- Mpls North, Suburbs	10- South of Minn. River
1- Mpls Downtown	44.4%	20.5%	8.1%	2.9%	1.1%	1.1%	1.9%	1.6%	14.3%	4.1%
2- Lake St South Mpls	13.0%	50.1%	16.2%	3.6%	1.4%	1.0%	0.8%	1.0%	10.1%	2.8%
3- 46th St South Mpls	6.1%	18.4%	41.7%	15.1%	2.8%	1.9%	1.6%	1.3%	7.5%	3.6%
4- 66/76th St, Richfield	2.2%	4.3%	16.5%	44.2%	11.3%	6.9%	1.4%	2.3%	4.6%	6.3%
5- American, Bloomington	1.6%	3.1%	5.6%	21.9%	28.7%	20.0%	2.2%	5.4%	2.9%	8.5%
6- 98th St, South Bloom.	1.4%	2.0%	3.1%	10.8%	15.7%	50.4%	1.0%	2.5%	2.3%	10.9%
7- MSP Inter. Airport	3.8%	2.8%	4.4%	3.9%	2.8%	1.5%	66.1%	6.1%	1.8%	7.0%
8- MOA, South Loop, Bloom.	5.8%	4.9%	5.7%	11.7%	13.2%	7.3%	12.5%	17.6%	3.0%	18.4%
9- Mpls North, Suburbs	8.4%	9.7%	6.1%	3.5%	1.1%	1.1%	0.6%	0.6%	66.8%	2.1%
10- South of MN River	1.1%	1.2%	1.3%	2.1%	1.4%	2.2%	0.9%	1.3%	0.9%	87.6%

Streetlight Data is from cell phone transmissions. Most travel occurs within the Subareas.

The next most common travel patterns between the subareas are:

	FROM	TO	Rank	Percent
Over 20%:	5 - American, Bloomington	4 - 66th/76th St, Richfield	1	21.9%
	1 - Downtown Minneapolis	2 - Lake St, South Mpls.	2	20.5%
	5 - American, Bloomington	6 - 98th St, South Bloomington	3	20.0%
Over 10%:	3 - 46th St, South Mpls.	2 - Lake St, South Mpls.	4	18.4%
	8 - MOA, South Loop, Bloomington	10 - South of Minn. River	5	18.4%
	4 - 66th/76th St, Richfield	3 - 46th St, South Mpls.	6	16.5%
	2 - Lake St, South Mpls.	3 - 46th St, South Mpls.	7	16.2%
	6 - 98th St, South Bloomington	5 - American, Bloomington	8	15.7%
	3 - 46th St, South Mpls.	4 - 66th/76th St, Richfield	9	15.1%
	1 - Downtown Minneapolis	9 - Mpls. North, Suburbs	10	14.3%
	8 - MOA, South Loop, Bloomington	5 - American, Bloomington	11	13.2%
	2 - Lake St, South Mpls.	1 - Downtown Minneapolis	12	13.0%
	8 - MOA, South Loop, Bloomington	7 - MSP Inter. Airport	13	12.5%
	8 - MOA, South Loop, Bloomington	4 - 66th/76th St, Richfield	14	11.7%
	4 - 66th/76th St, Richfield	5 - American, Bloomington	15	11.3%
	6 - 98th St, South Bloomington	10 - South of Minn. River	16	10.9%
	6 - 98th St, South Bloomington	4 - 66th/76th St, Richfield	17	10.8%
	2 - Lake St, South Mpls.	9 - Mpls. North, Suburbs	18	10.1%

7 DEMOGRAPHICS AND LAND USE

Transit ridership levels are affected by population and employment densities as well as major generators such as shopping centers and colleges/universities. Population groups more likely to use transit include lower income households and households where everyone over age 16 does not have reliable access to a car at all times. This section of the report outlines the existing demographics in the Study Area.

Population

The northern quarter of the Study Area has one of the densest areas of residential population as seen in Figure 11. Within Minneapolis, there is continuous high-density residential area (over 15 units per acre) extending east of downtown to the University of Minnesota in the Cedar-Riverside neighborhood, and south generally as far as 38th Street. Other pockets of high population density are found near Highway 62 and in Richfield near Lyndale Avenue at 66th Street and just north of I-494.

Employment

The most significant concentrations of jobs in the region are in Downtown Minneapolis and Downtown St. Paul. Within the Study Area, the corridors with significant employment density are Lake Street in Minneapolis, near Southdale Center in Edina, along I-494/American Boulevard, around Mall of America (South Loop area), and also near 98th Street and I-35W in Bloomington as shown in Figure 12. The jobs paying under \$40,000 annually, which can support transit service even with the disadvantage of free parking, are much more dispersed than general jobs. This indicates that a grid of bus routes is needed to provide connections with the Orange Line.

Vehicle Availability

Strong transit corridors link areas with high employment density and areas with the lower vehicle availability rates per household. Often areas with high levels of low-income populations, or places where free parking is not readily available, tend to have lower rates of vehicle availability. Households with more licensed drivers than vehicles often create higher transit use as well as more walking and bicycle use, out of necessity. See Figure 13.

Low-Income Households

The areas with the greatest amount of poverty are situated near the downtown/urban core of both Minneapolis and St. Paul. Figure 14 shows the greatest concentrations are located just south of downtown Minneapolis. These areas of high poverty are also known for their ethnic diversity and are often home to first generation immigrants. Effective transit can be the substitute for the expense of automobile ownership and contribute in a strong way to the climb out of poverty. Effective transit for low income populations must be designed to connect them with jobs and schools, implying the importance of crosstown bus service in the Study Area, particularly considering the areas of ACP50. These are neighborhoods where 40% or more of families or individuals have incomes less than 185% of the federal poverty threshold and where 50% or more of the residents are people of color.

Communities of Color

Figure 15 shows communities of color. These populations have a higher propensity to ride transit because this population also tends to live in the areas with lower household incomes and fewer automobiles available. This overlap is evident by comparing the maps on figures 13, 14 and 15. The greatest concentrations of minority populations in the Study Area are in the areas south and east of Downtown Minneapolis and near I-494 in Bloomington and Richfield. Good north-south and east-west transit service in these areas improves access for this population to jobs, schools and shopping and so helps to overcome the equity gap facing the Twin Cities.

Retail Centers

Retail centers, like other major activity centers, are large trip generators that usually serve as focal points for transit service. Figure 16 shows the location of shopping centers in the Study Area. Most of the retail shopping centers are community and neighborhood retail centers with three major exceptions: Mall of America in Bloomington, Southtown Center in Bloomington and Southdale Center in Edina. Several neighborhood commercial nodes are found throughout the Study Area, including the Hub Center on 66th Street at Nicollet Avenue in Richfield, and Valley West Center on Old Shakopee Road & France Avenue in Bloomington.

Student Population

High schools and colleges/universities can be major contributors to transit ridership if transit is provided to an adequate degree. The Study Area includes one suburban post-secondary institution, Normandale Community College, an undergraduate campus located on West 98th Street near France Avenue South. The current student population is about 6,900. During the school year, the college attracts over 100 riders to Route 535 or more than 10% of the daily rides on the route. There are other colleges and universities nearby that also attract a significant number of students living in the study area, such as the University of Minnesota, University of St. Thomas – Minneapolis Campus, Augsburg College and the Minneapolis Community and Technical College.

Figure 17 shows the nine high schools and Normandale Community College in the Orange Line Study Area, with a Fall 2018 enrollment of 13,507 students. Minneapolis Public Schools generally does not provide yellow school bus service for high school students. Instead students receive a Go-To Card to use to travel to school and other activities, which is a source of significant ridership during the school year on routes that serve these schools. The two Bloomington high schools and Richfield High School are located near transit lines that could also fulfill student transportation needs.

Senior (Age 65+) Population

Senior citizens are a market segment that can have special mobility needs that can be served well by transit, although this is less true today than in the past. Transit can replace the personal vehicle when driving is no longer possible or available and is less expensive for those on fixed incomes. The areas with the highest density of people age 65 and older are primarily in the more suburban areas of the region. Figure 18 shows where seniors live within the Study Area as well as senior housing sites, which account for most of the areas with high numbers of seniors. The Orange Line's 66th Street Station is close to a node of senior housing. Housing for seniors, particularly in suburban areas, sometimes has their own shuttle bus to transport residents for weekly outings and this often reduces the demand for regular transit from those locations.

Figure 11 - Residential Density

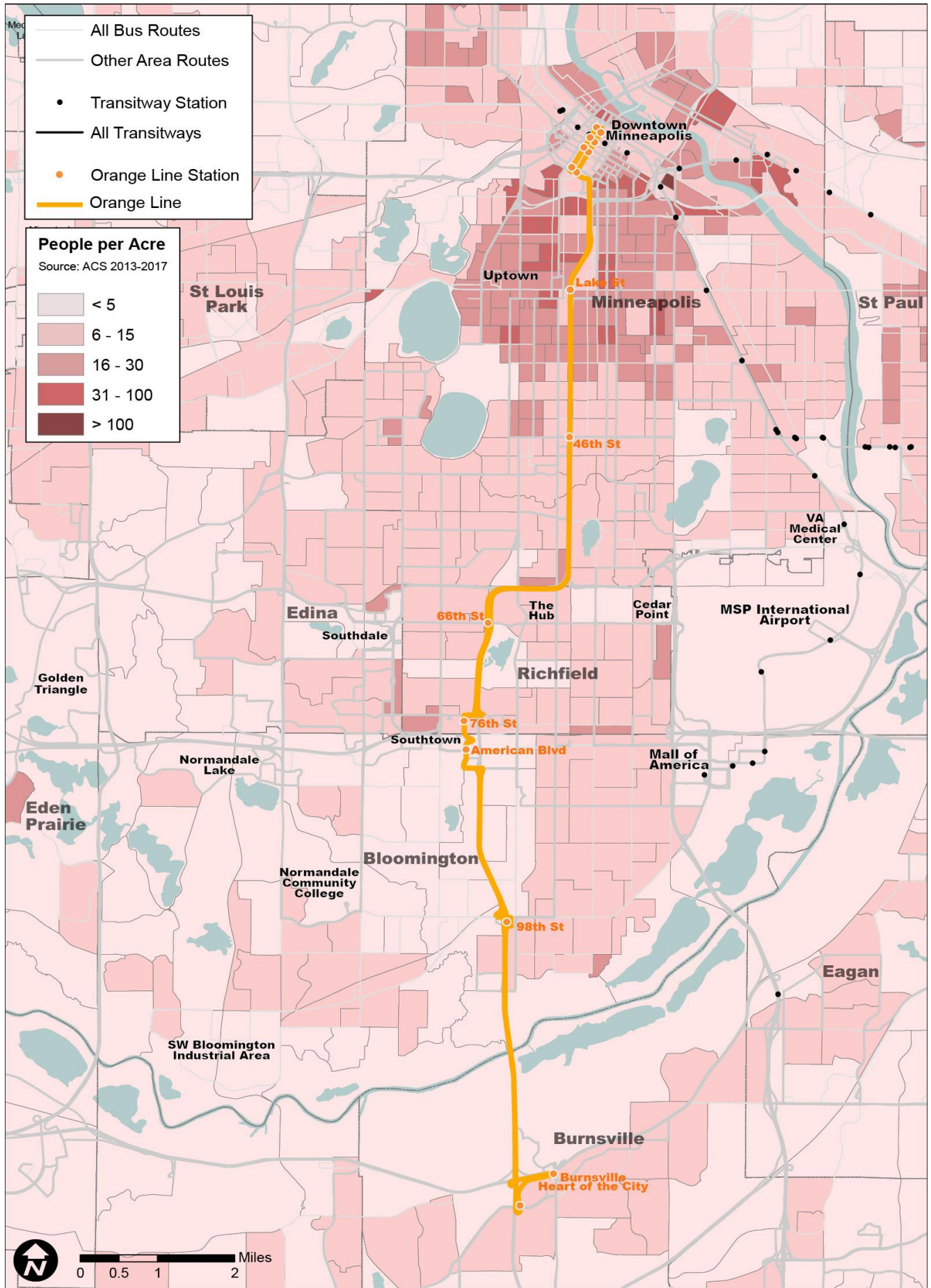


Figure 12 - Employment Density and Distribution

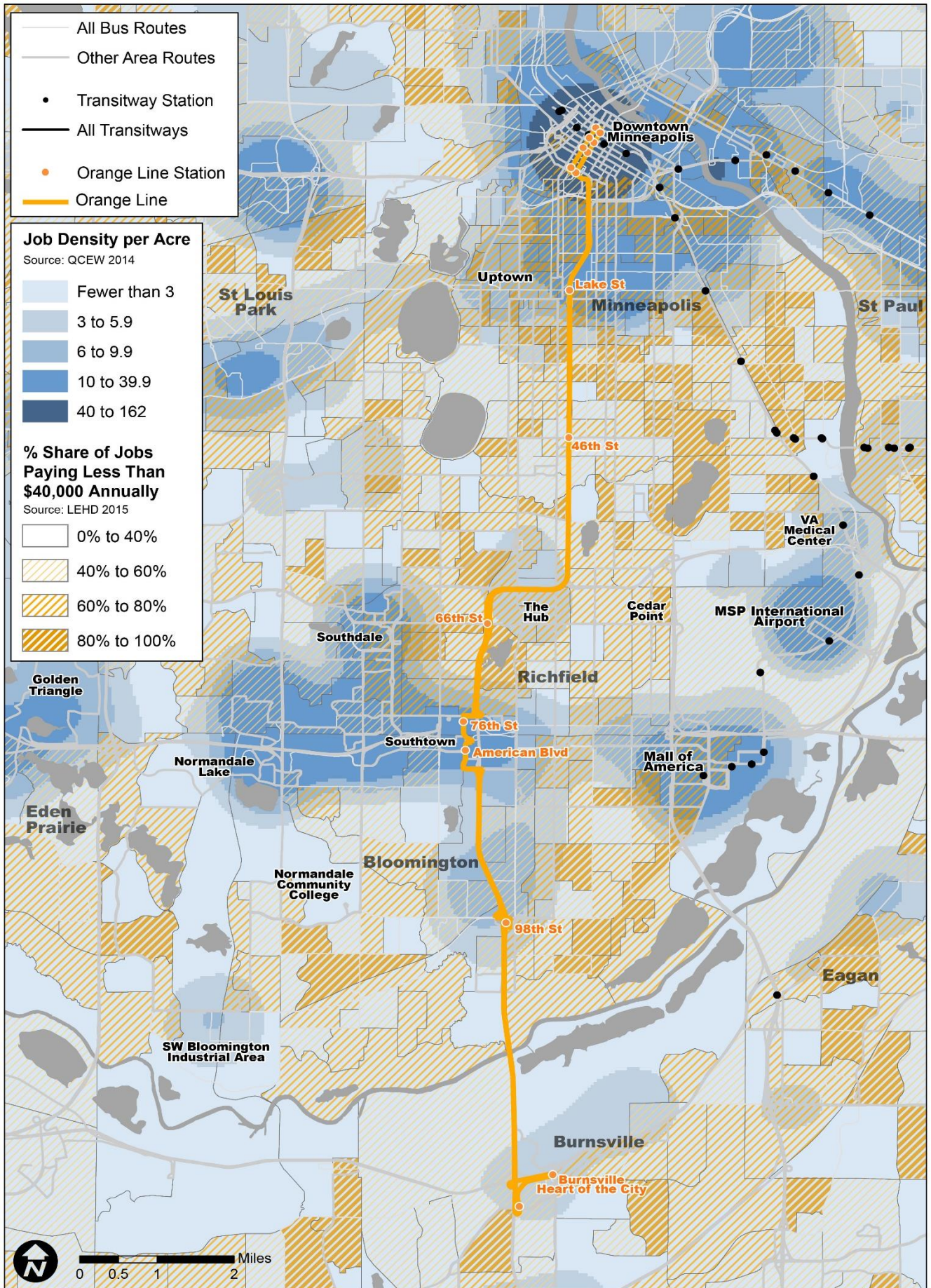


Figure 13- Vehicle Availability

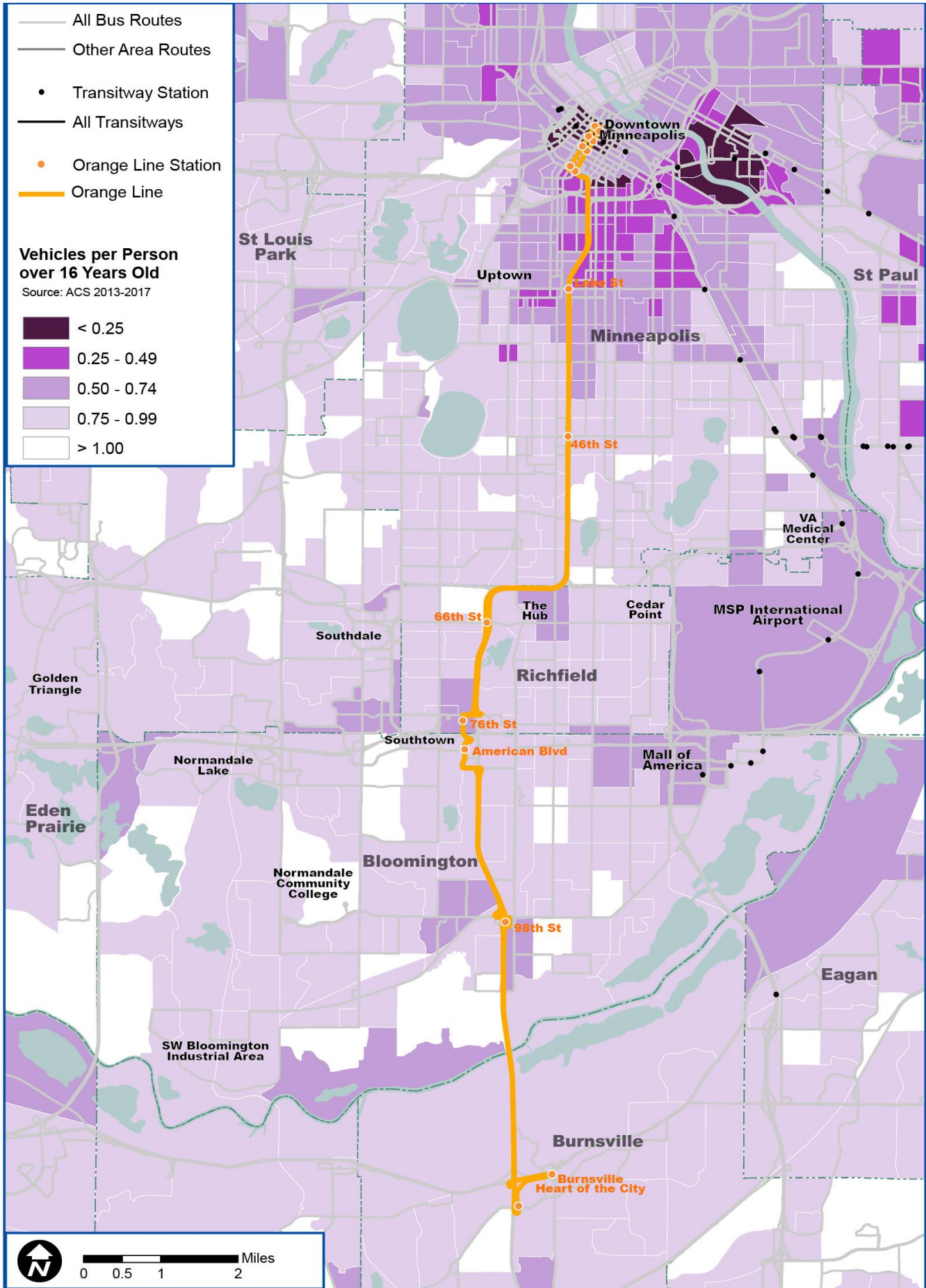


Figure 14 - Low-Income Populations

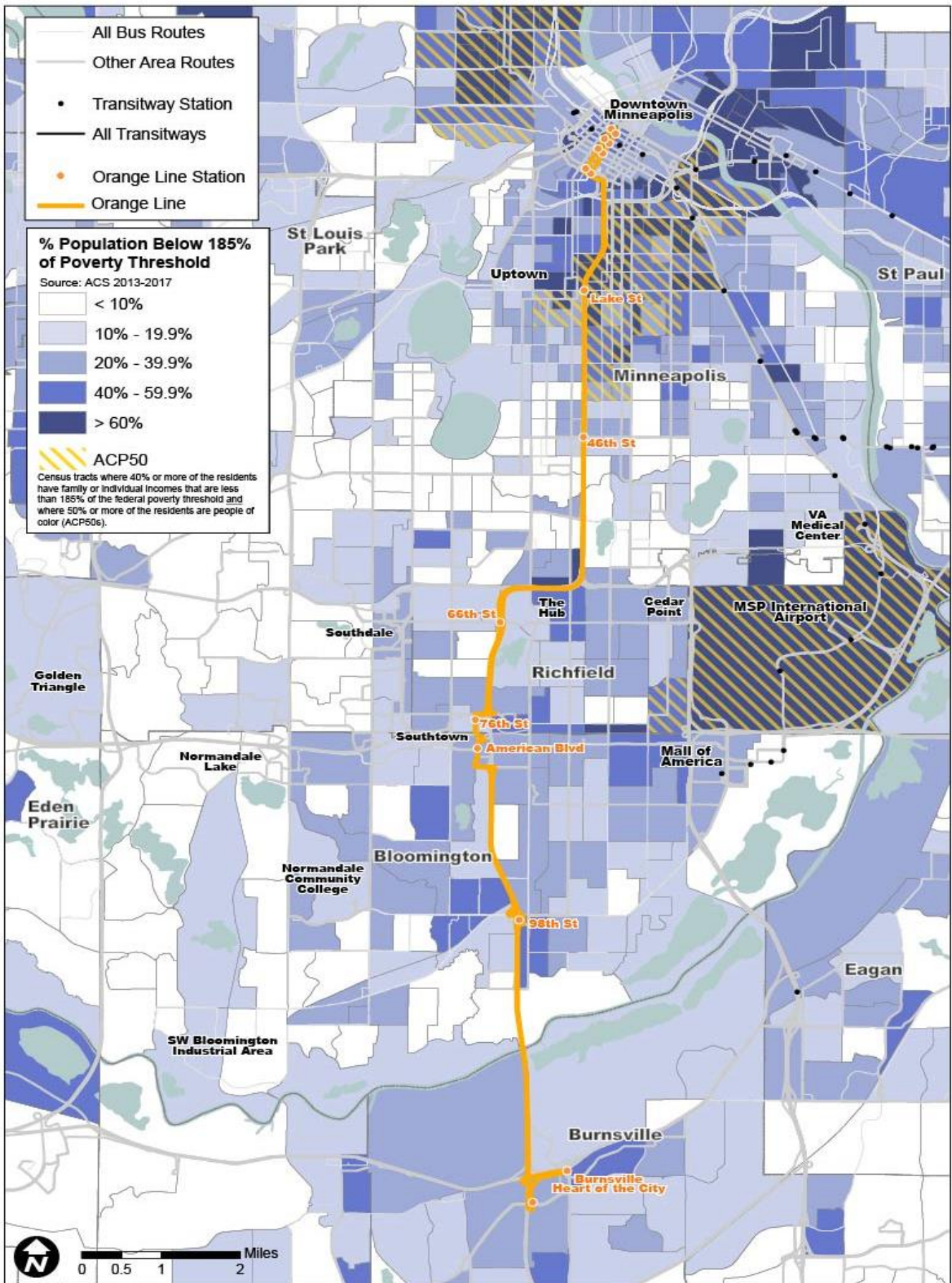


Figure 15 - Communities of Color

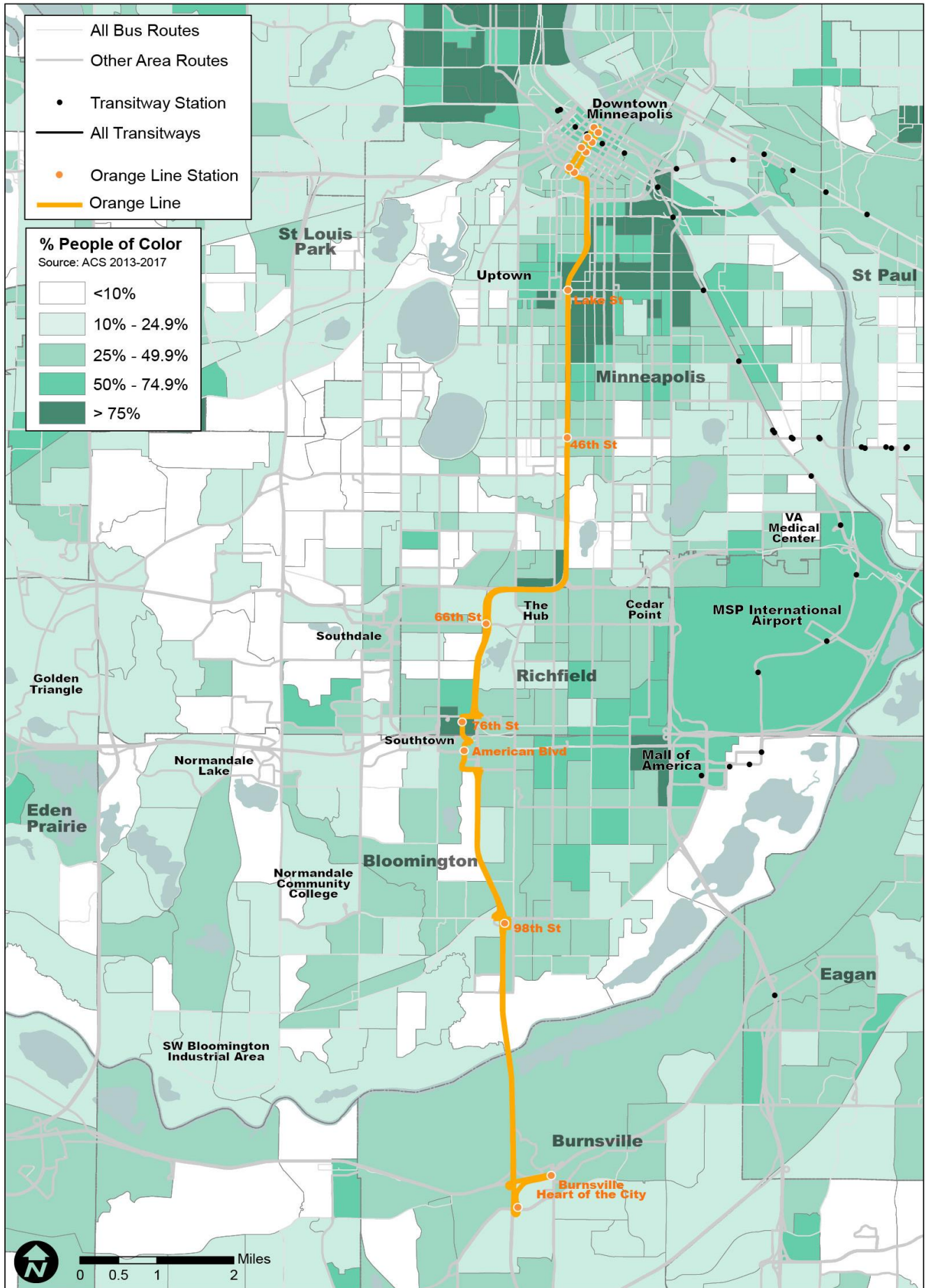


Figure 16 - Major Retail Centers

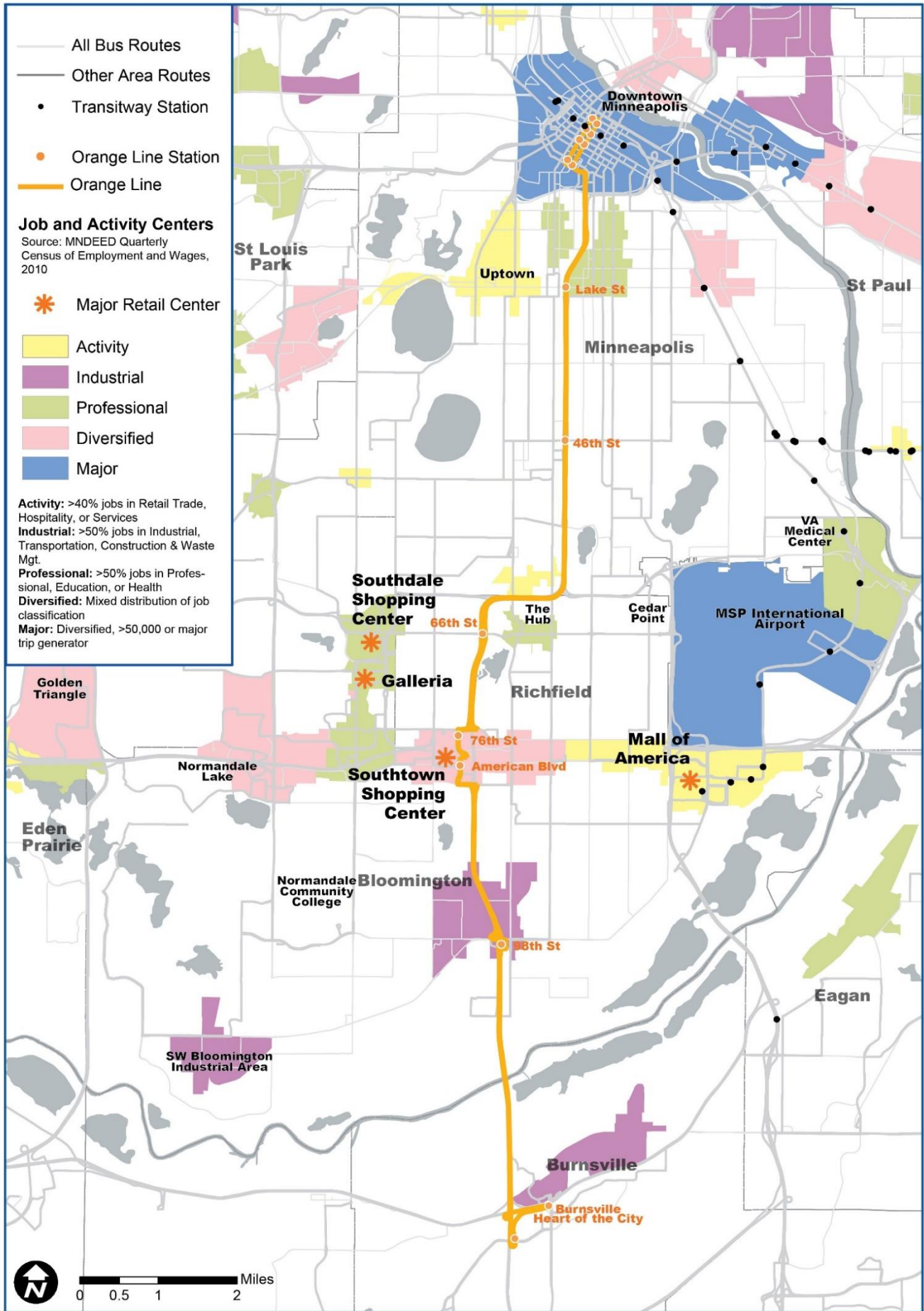


Figure 17 - Enrollments in Secondary, Post-secondary Schools

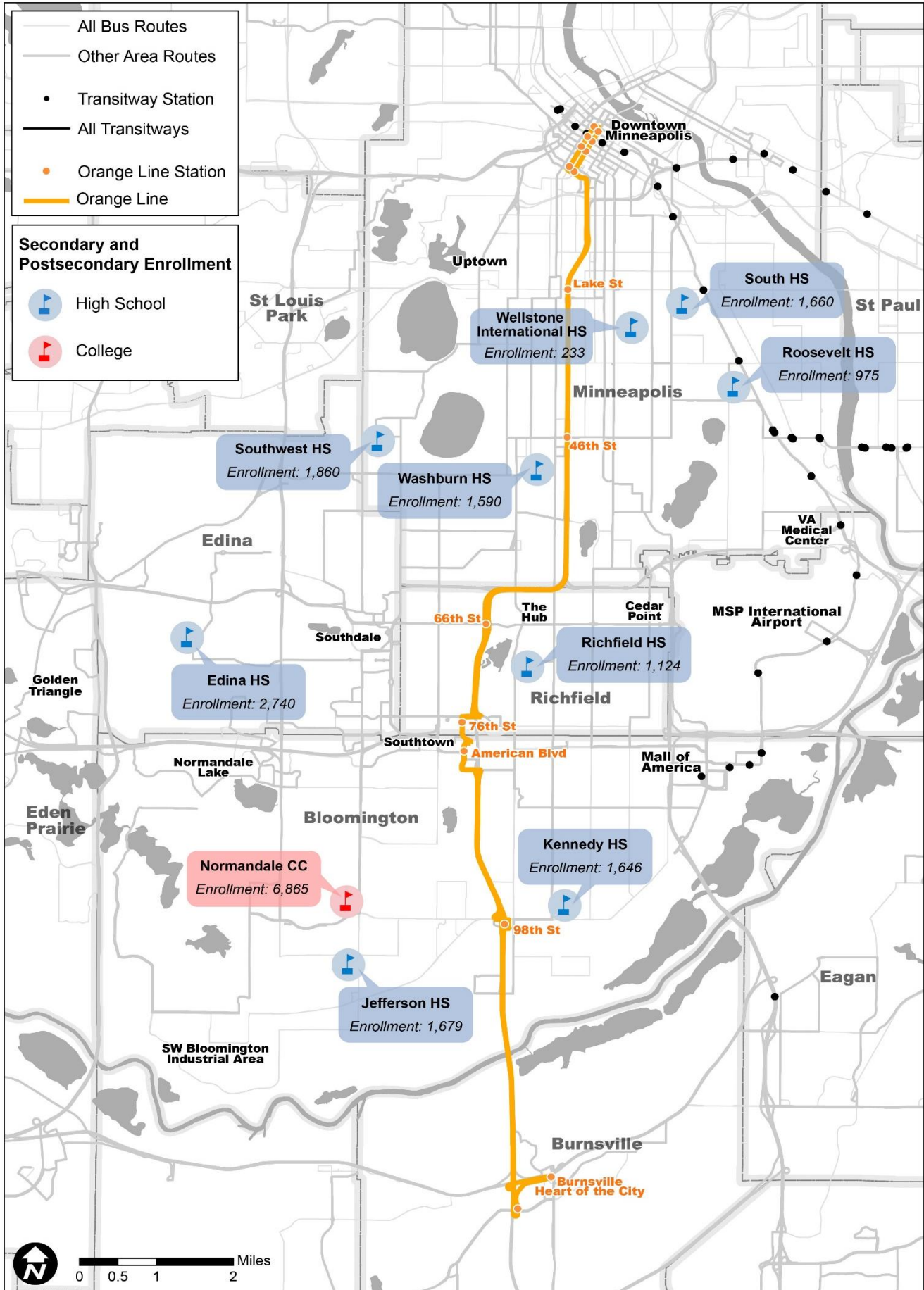
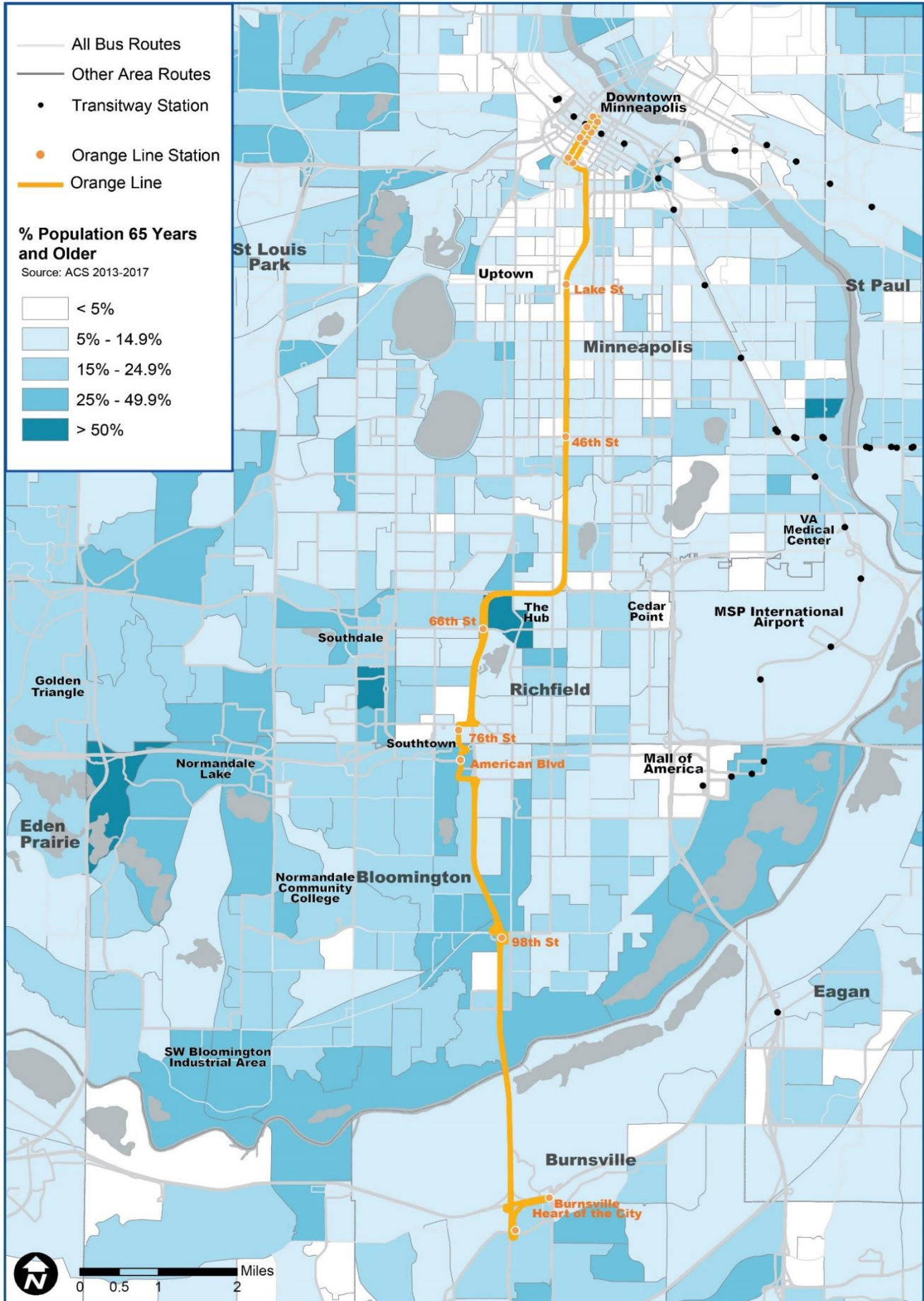


Figure 18 – Senior Population



CONCLUSION

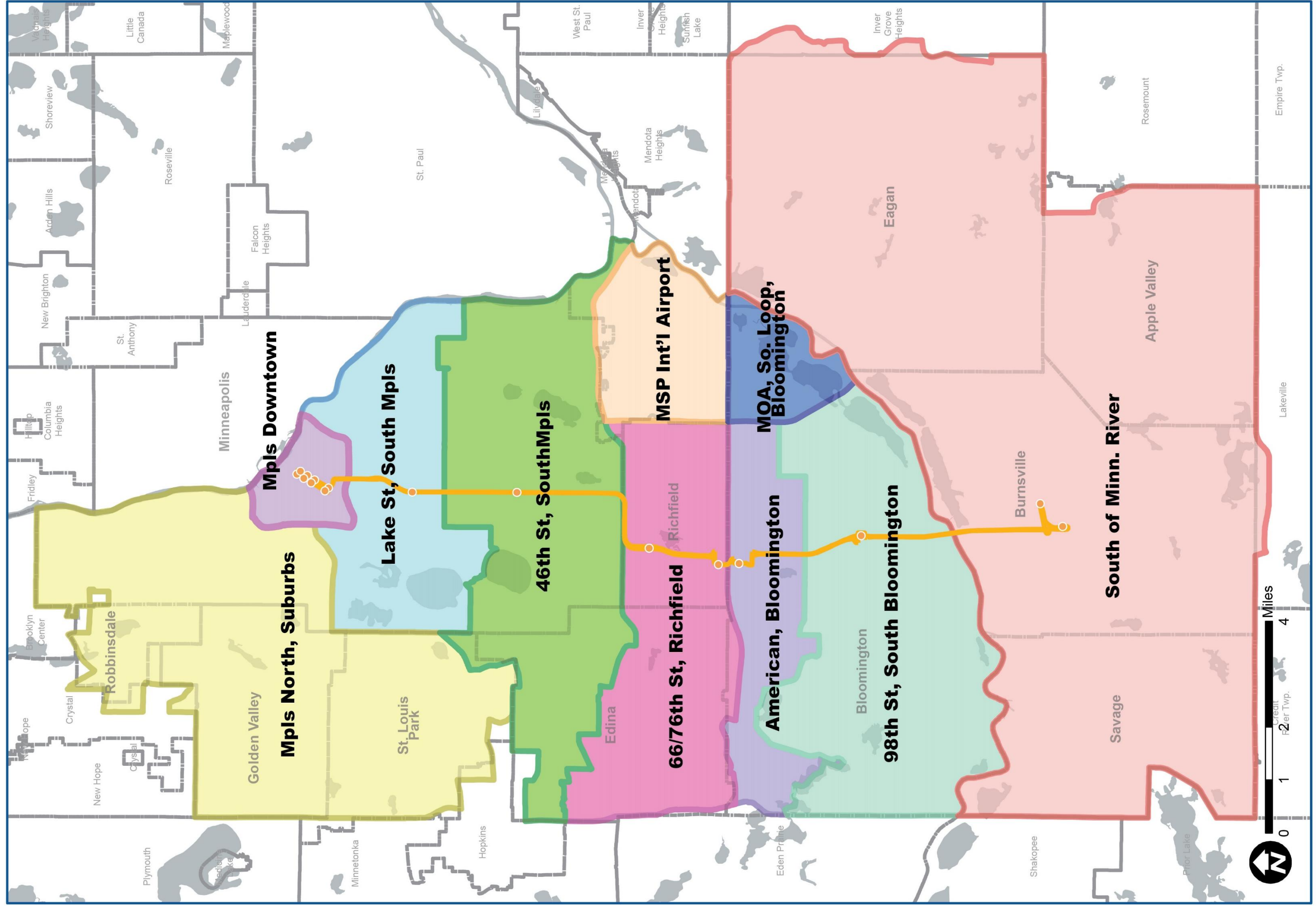
Many of the key travel patterns in the Study Area are well served by the existing transit system. The METRO Orange Line will replace most of Route 535, the current I-35W South precursor route, but there are some locations that will need to be served with routes connecting to the Orange Line to maintain ridership. New connecting bus service links will be required to preserve quality transit access to important destinations away from I-35W, notably Normandale Community College and along Lyndale Avenue in Bloomington. Beyond these noted areas, there are other potential new connecting service possibilities with the Orange Line and opportunities to serve new transit markets and improve transit facilities.

The next step is the Orange Line Connecting Bus Study concept plan, which will lay out how to link the Orange Line with the rest of the Study Area using effective connecting routes.

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Appendix – Map of Major Origins and Destinations in the METRO Orange Line Study Area



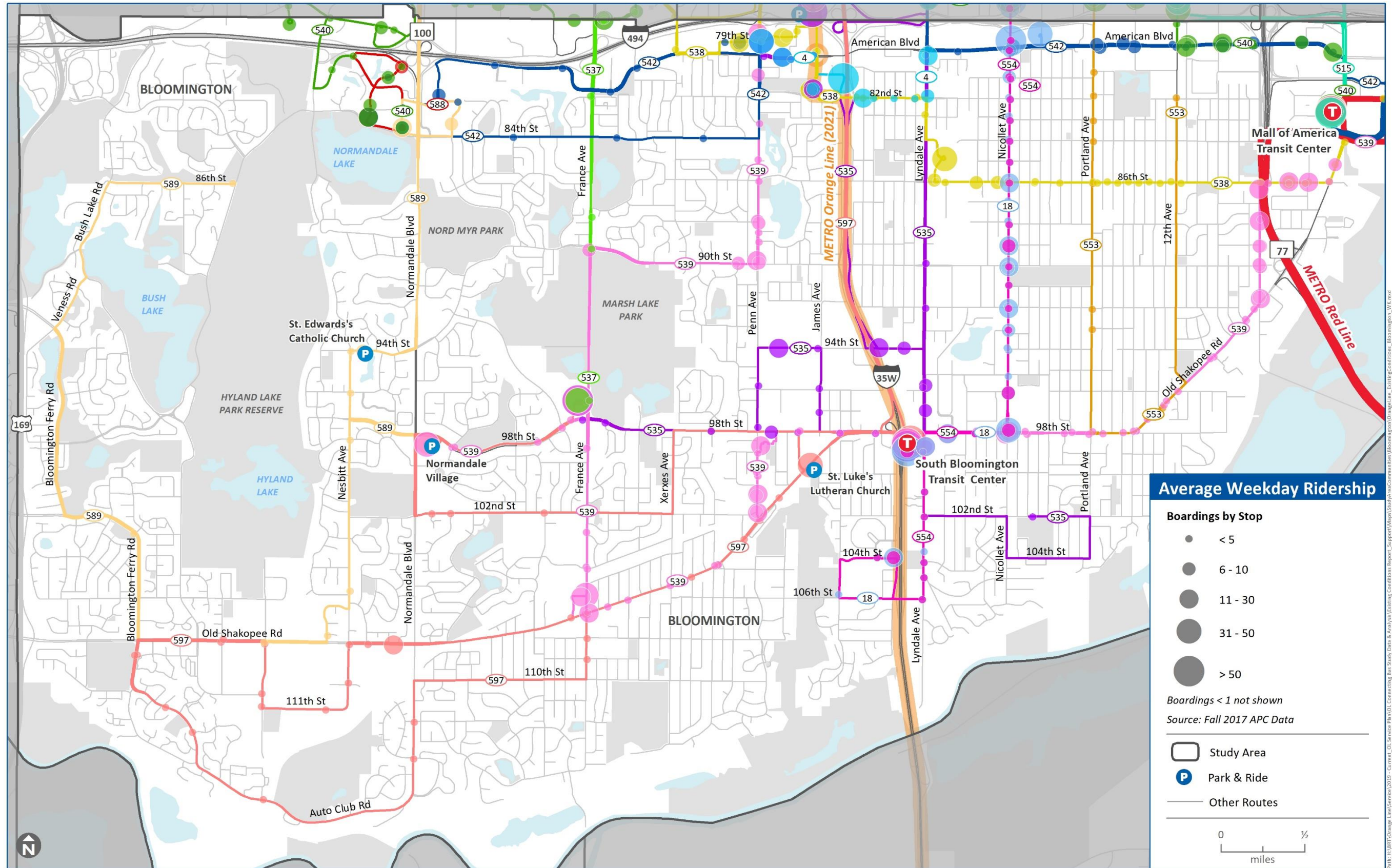
Appendix - Chart of Northbound Passenger Boardings or ONs - Route 535 Weekday – Fall 2017 - At METRO Orange Line Stations

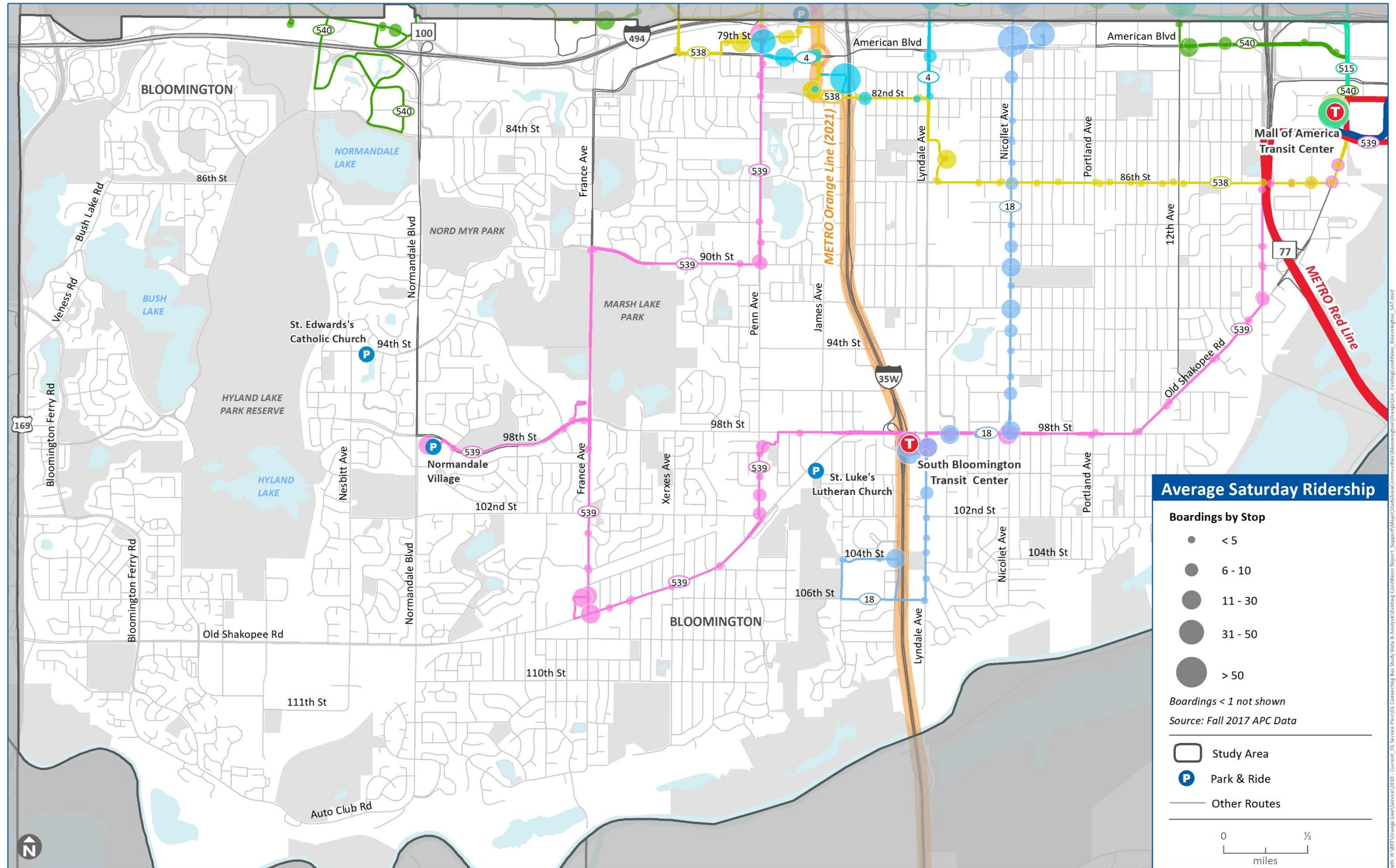
Route 535 Weekday Passengers ON, Northbound Compared with Orange Line Stations		X = At Orange Line Station	Passengers ON	% Total ON @ Orange Line Sta.	Passengers OFF	% Total OFF @ Orange Line Sta.
Route 535 Bus Stops Northbound			105			
NORMANDALE COLLEGE & ENTRANCE			2		0	
98TH ST W & NORMANDALE COLLEGE			2		0	
98TH ST W & CHOWEN AVE S			1		0	
98TH ST W & ABBOTT AVE S			0		0	
98TH ST W & XERXES AVE S			3		0	
98TH ST W & UPTON CIRCLE			0		0	
98TH ST W & RUSSELL AVE S			3		0	
PENN AVE S & 98TH ST W			3		0	
PENN AVE S & 96TH ST W			0		0	
PENN AVE S & 95TH ST W			15		1	
94TH ST W & DONALDSON CO			3		0	
94TH ST W & JAMES AVE S			0		0	
JAMES AVE S & SOUTHTOWN PLAZA			1		0	
JAMES AVE S & 96TH ST W			1		0	
JAMES AVE S & 97TH ST W			5		1	
98TH ST W & PENN AVE / NEWTON AVE S			1		0	
98TH ST W & LOGAN AVE S			0		0	
98TH ST W & JAMES CIRCLE			2		0	
98TH ST W & HUMBOLDT AVE S			2		0	
98TH ST W & FREMONT AVE / DUPONT AVE S			1		0	
102ND ST E & STEVENS AVE / 2ND AVE S			0		0	
102ND ST E & 4TH AVE S			1		0	
102ND ST E & PORTLAND AVE S			0		0	
104TH ST E & 4TH AVE S			0		0	
104TH ST E & HOLY EMMANUEL CHURCH			0		0	
104TH ST E & NICOLLET AVE S			0		0	
NICOLLET AVE S & 102ND ST E			0		0	
102ND ST W & BLAISDELL AVE S			0		0	
102ND ST W & PLEASANT AVE S			1		0	
102ND ST W & HARRIET AVE S			1		0	
102ND ST W & LYNDALE AVE S			0		0	
LYNDALE AVE S & #10031			0		0	
SO BLOOMINGTON TRANSIT CTR & GATE C		X	36	4.1%	36	
LYNDALE AVE S & 99TH ST / 98TH ST W		X+	7		3	
LYNDALE AVE S & OXBORO PLAZA		X+	7		1	
LYNDALE AVE S & MCDONALDS		X+	9		4	
94TH ST W & BRYANT AVE S			10		1	
94TH ST W & I-35W ENTRANCE RAMP			13		1	
KNOX AVE S & 82ND ST / 81ST ST W		X+	14		7	0.8%
AMERICAN BLVD & KNOX AVE S		X	3	0.4%	2	0.3%
AMERICAN BLVD & SOUTHTOWN CENTER		X+	15		5	0.6%
PENN AVE S & SOUTHTOWN CENTER			33		6	
PENN AVE S & BEST BUY INC HQ			30		6	
76TH ST W & NEWTON AVE S			67		8	
LYNDALE AVE S & 94TH ST / 93RD ST W			0		0	
LYNDALE AVE S & 92ND ST W			2		0	
LYNDALE AVE S & 90TH ST W			2		1	
LYNDALE AVE S & HALSEY LANE			0		0	
LYNDALE AVE S & HALSEY LANE / 86TH ST			0		0	
LYNDALE AVE S & 86TH ST W			0		0	
LYNDALE AVE & LYNDALE CIRCLE / 83RD ST			0		0	
LYNDALE AVE S & 82ND ST W			0		0	
LYNDALE AVE S & 80TH ST / AMERICAN BLVD			0		0	
77TH ST W & LYNDALE AVE S			4		0	
77TH ST W & BEST BUY DRIVEWAY			0		0	
77TH ST W & 76TH ST W			1		0	
76TH ST W & GIRARD AVE S			0		0	
KNOX AVE S & 76TH ST W			7		1	
KNOX AVE S & KNOX AVE P&R		X+	168	18.9%	4	6.8%
KNOX AVE S & KNOX AVE P&R / DICKS SPORTS		X	19	2.1%	1	0.1%
76TH ST W & KNOX AVE S		X+	51	5.8%	4	3.8%
76TH ST W & GIRARD AVE S			1		0	
77TH ST W & MERIDIAN CROSSING			9		0	
77TH ST W & BEST BUY DRIVEWAY			1		0	
77TH ST W & LYNDALE AVE S			4		3	
I-35W EXIT & 66TH ST W		X	91	10.2%	16	1.8%
I-35W & 46TH ST STATION - GATE C		X	115	13.0%	38	4.4%
I-35W & LAKE STE		X	1	0.1%	52	6.0%
2ND AVE S & 11TH ST - STOP GROUP G		X	8	0.9%	142	16.2%
2ND AVE S & 9TH ST - STOP GROUP G		X+	2	0.2%	110	12.5%
2ND AVE S & 7TH ST - STOP GROUP G		X	1	0.1%	229	26.1%
2ND AVE S & 5TH ST - STOP GROUP G		X	0	0.0%	108	12.4%
2ND AVE S & WASHINGTON AVE S		X	1	0.1%	40	0.1%
2ND AVE S & 2ND ST S		X+	1		6	0.7%
2ND ST S & 3RD AVE S		X+			35	4.0%
TOTAL NORTHBOUND		ON =	887	OFF =	876	
X = Total NORTHBOUND @ OL Stations		ON =	277	31.2%	629	71.8%
X+ = TOTAL NORTHBOUND < 1/4 mile Walk		ON =	550	62.0%	807	92.1%
Y = TOTAL NORTHBOUND CONNECTING		ON =	337	38.0%	69	7.9%
Base Ridership for METRO Orange Line =		1,353	ONS per Weekday			
Add 50% minimum of Connecting rts (Y)=		219				
Base Ridership for METRO Orange Line =		1,572	ONS est. per Weekday with new transfers			

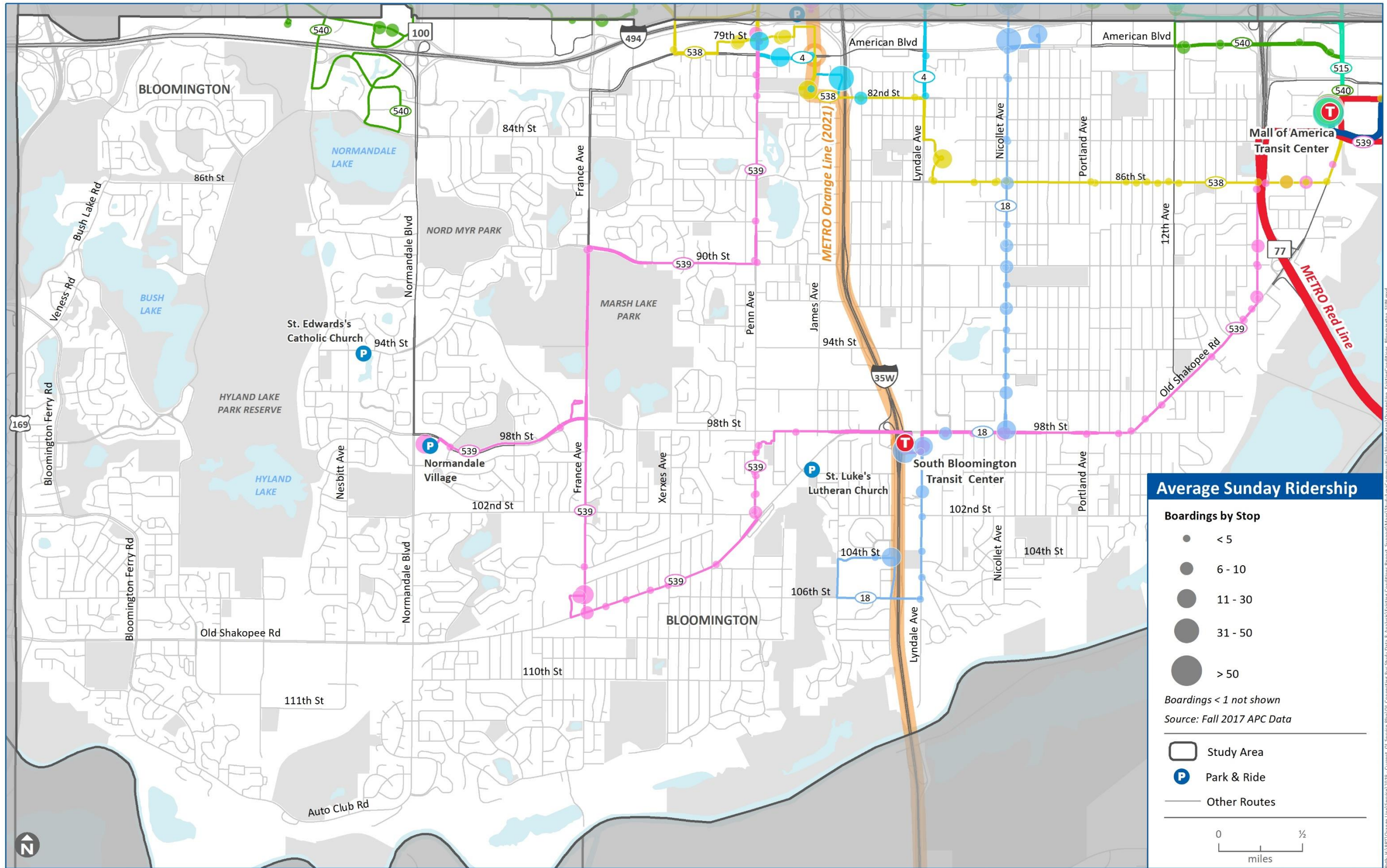
Source: Metro Transit Automatic Passenger Counter Report (APC) Date range 9/5 thru 11/30/2017

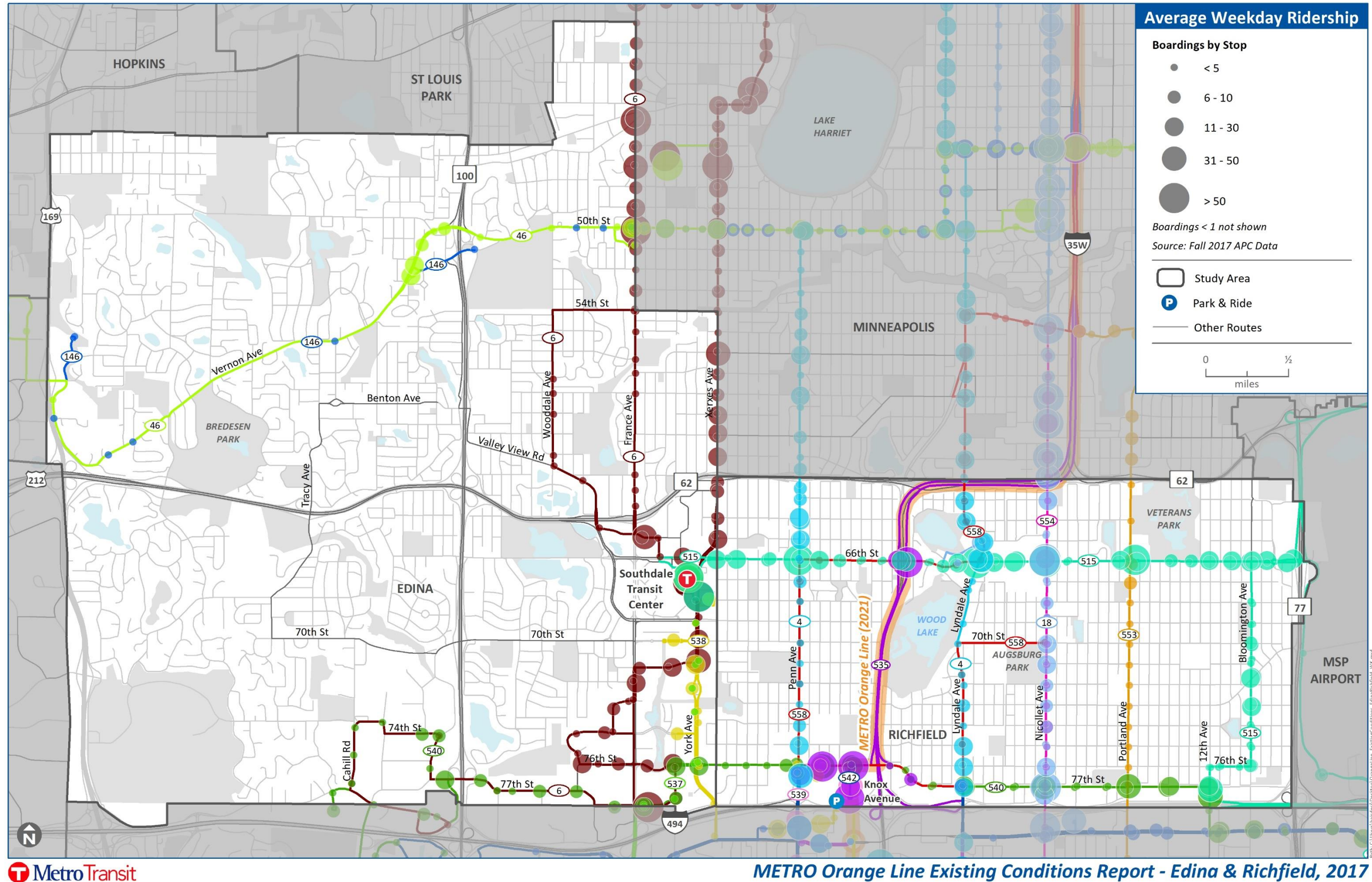
Appendix - Chart of Southbound Passenger Boardings or ONs - Route 535 Weekday – Fall 2017 - At METRO Orange Line Stations

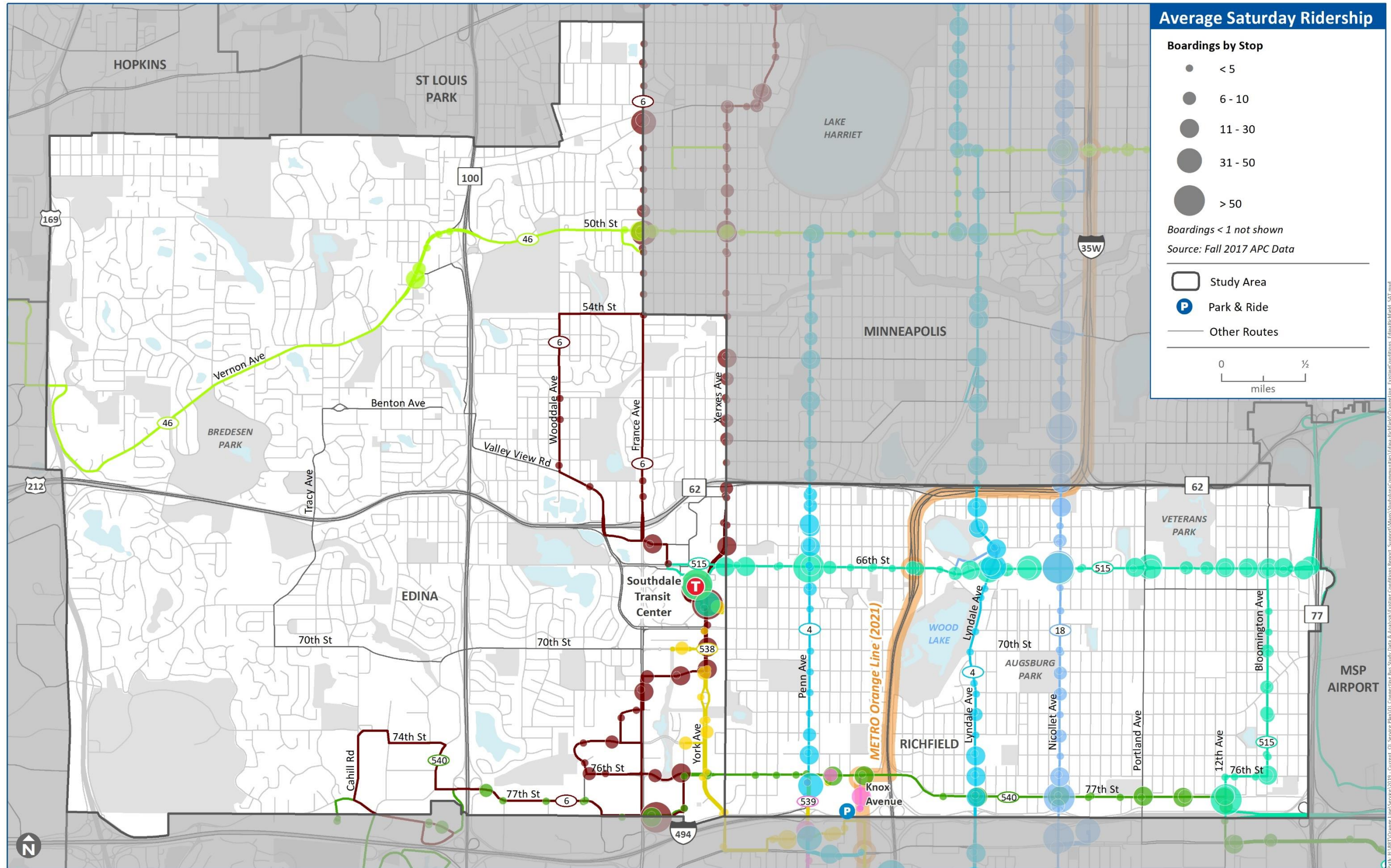
Route 535 Weekday Passengers ON, Southbound Compared with Orange Line Stations		X = At Orange Line Station	Passengers ON	% Total ON @ Orange Line Sta.	Passengers OFF	% Total OFF @ Orange Line Sta.
Route 535 Bus Stops Southbound						
2ND ST S & 3RD AVE S			26			
MARQUETTE AVE & 2ND ST S	X+		52		0	
MARQUETTE AVE & 4TH ST - STOP GROUP D	X		107	11.8%	3	0.3%
MARQUETTE AVE & 6TH ST - STOP GROUP D	X		216	23.9%	4	0.4%
MARQUETTE AVE & 8TH ST - STOP GROUP D	X		159	17.6%	3	0.3%
MARQUETTE AVE & 10TH ST - STOP GROUP D	X+		101	11.2%	2	0.3%
12TH ST S & 2ND AVE / 3RD AVE S	X		47	5.2%	1	0.1%
I-35W & LAKE STE	X		51	5.7%	10	1.2%
I-35W & 46TH ST STATION - GATE D	X		39	4.3%	123	14.0%
I-35W EXIT & 66TH ST W	X		13	1.5%	83	9.4%
77TH ST W & LYNDALE AVE S			2		6	
77TH ST W & BEST BUY DRIVEWAY			0		3	
77TH ST W & 76TH ST W			0		5	
76TH ST W & GIRARD AVE S			0		0	
KNOX AVE S & 76TH ST W			2		54	
KNOX AVE S & KNOX AVE P&R	X+		4	0.4%	174	19.7%
KNOX AVE S & KNOX AVE P&R / DICKS SPORTS	X		0	0.1%	1	0.2%
76TH ST W & KNOX AVE S	X+		3	0.4%	20	2.2%
76TH ST W & NEWTON AVE S			9		79	
PENN AVE S & 76TH ST W			10		10	
PENN AVE S & HWY 494			4		23	
AMERICAN BLVD & PENN AVE S			3		16	
AMERICAN BLVD & MORGAN CIRCLE	X+		3	0.3%	5	0.6%
AMERICAN BLVD & KNOX AVE S	X		1	0.1%	2	0.2%
KNOX AVE S & #8100	X+		6	0.7%	11	1.2%
82ND ST W & JAMES AVE S			1		1	
94TH ST W & I-35W EXIT RAMP			1		15	
94TH ST W & BRYANT AVE S			1		8	
76TH ST W & KNOX AVE S			1		1	
76TH ST W & GIRARD AVE S			0		1	
77TH ST W & MERIDIAN CROSSING			0		0	
77TH ST W & BEST BUY DRIVEWAY			0		0	
77TH ST W & LYNDALE AVE S			1		5	
LYNDALE AVE S & AMERICAN BLVD			0		1	
LYNDALE AVE S & 83RD ST W			0		2	
LYNDALE AVE S & LYNDALE CIRCLE			0		1	
LYNDALE AVE S & 86TH ST W			0		1	
LYNDALE AVE S & 86TH ST / 90TH ST W			0		0	
LYNDALE AVE S & 90TH ST W			0		1	
LYNDALE AVE S & 92ND ST W			0		1	
LYNDALE AVE S & 92ND ST / 93RD ST W			0		0	
LYNDALE AVE S & 94TH ST W			0		0	
LYNDALE AVE S & 94TH ST / 95TH ST W			1		4	
LYNDALE AVE S & 96TH ST W			2		13	
LYNDALE AVE S & 96TH ST W			1		2	
LYNDALE AVE S & 98TH ST W	X+		1		7	0.8%
LYNDALE AVE S & 99TH ST W	X+		2		8	0.9%
SO BLOOMINGTON TRANSIT CTR & GATE C	X		31		24	2.7%
98TH ST W & DUPONT AVE / FREMONT AVE			0		3	
98TH ST W & GIRARD AVE S			0		0	
98TH ST W & JAMES AVE S			0		2	
JAMES AVE S & 97TH ST W			0		0	
JAMES AVE S & 96TH ST W			0		0	
JAMES AVE S & SOUTHTECH PLAZA			0		0	
94TH ST W & JAMES AVE S			0		0	
94TH ST W & #1900			0		15	
PENN AVE S & 94TH ST W			0		1	
PENN AVE S & 95TH ST W			0		0	
PENN AVE S & 96TH ST W			0		3	
PENN AVE S & 98TH ST W			0		0	
98TH ST W & LOGAN AVE S			0		3	
98TH ST W & NEWTON AVE S			0		3	
98TH ST W & PENN AVE S			0		5	
98TH ST W & RUSSELL AVE S			0		0	
98TH ST W & UPTON RD			0		2	
98TH ST W & XERXES AVE S			0		0	
98TH ST W & ABBOTT AVE S			0		1	
98TH ST W & CHOWEN AVE S			0		2	
NORMANDALE COLLEGE & ENTRANCE					104	
LYNDALE AVE S & #10031			0		0	
102ND ST W & LYNDALE AVE S			0		0	
102ND ST W & HARRIET AVE S			0		0	
102ND ST W & GRAND AVE S			0		0	
102ND ST W & WENTWORTH AVE S			0		0	
102ND ST E & NICOLLET AVE S			0		0	
NICOLLET AVE S & 104TH ST E			0		0	
104TH ST E & HOLY EMMANUEL CHURCH			0		0	
104TH ST E & 4TH AVE S			0		0	
102ND ST E & PORTLAND AVE S			0		0	
102ND ST E & CLINTON AVE S			0		0	
102ND STE & STEVENS AVE S			0		0	
TOTAL SOUTHBOUND	ON =	903	OFF =	882		
X = Total SOUTHBOUND @ OL Stations		634	70.2%	254	28.8%	
X+ = TOTAL SOUTHBOUND < 1/4 mile Walk	ON =	803	89.0%	480	54.4%	
Y = TOTAL SOUTHBOUND CONNECTING	ON =	100	11.0%	402	45.6%	

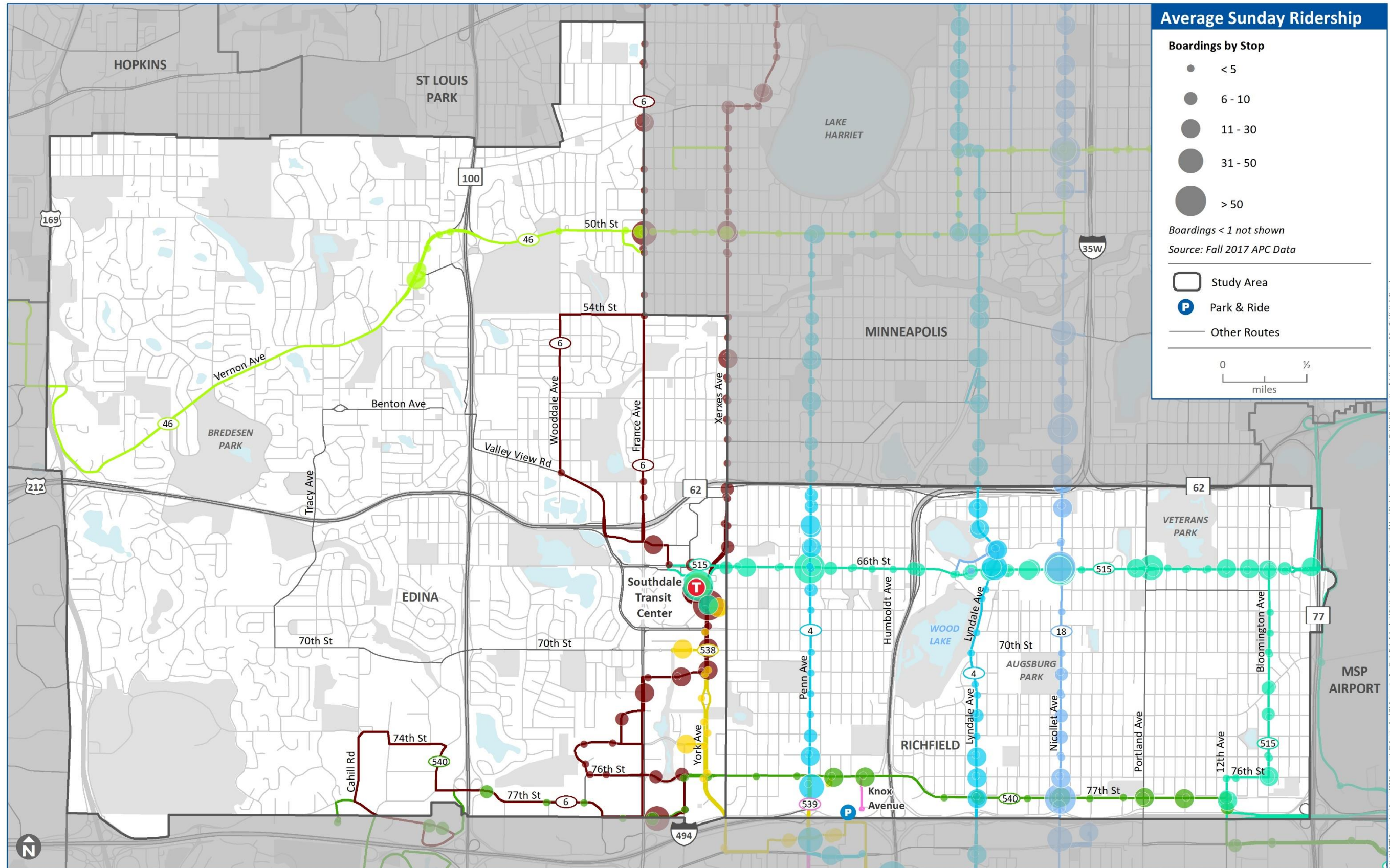


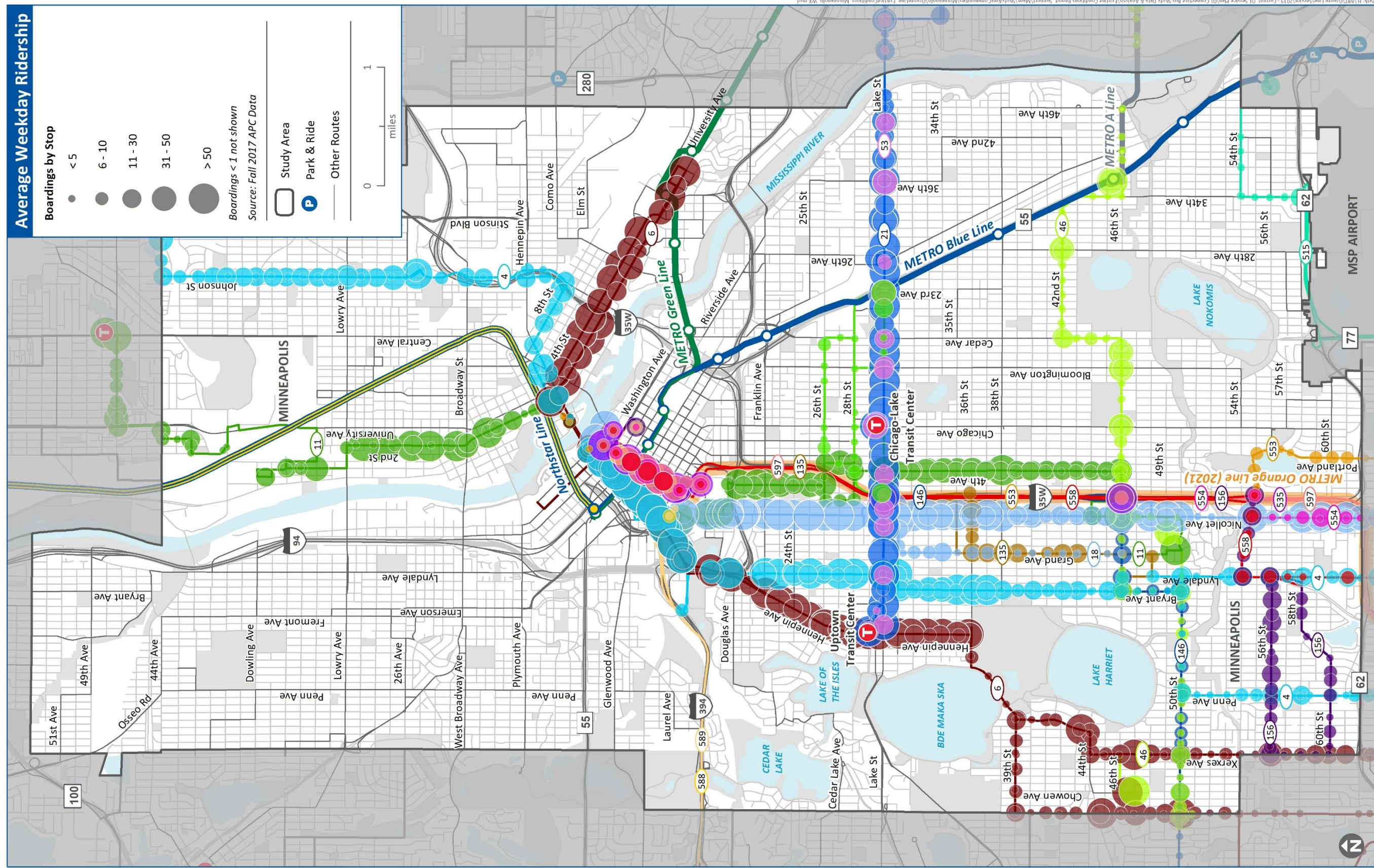






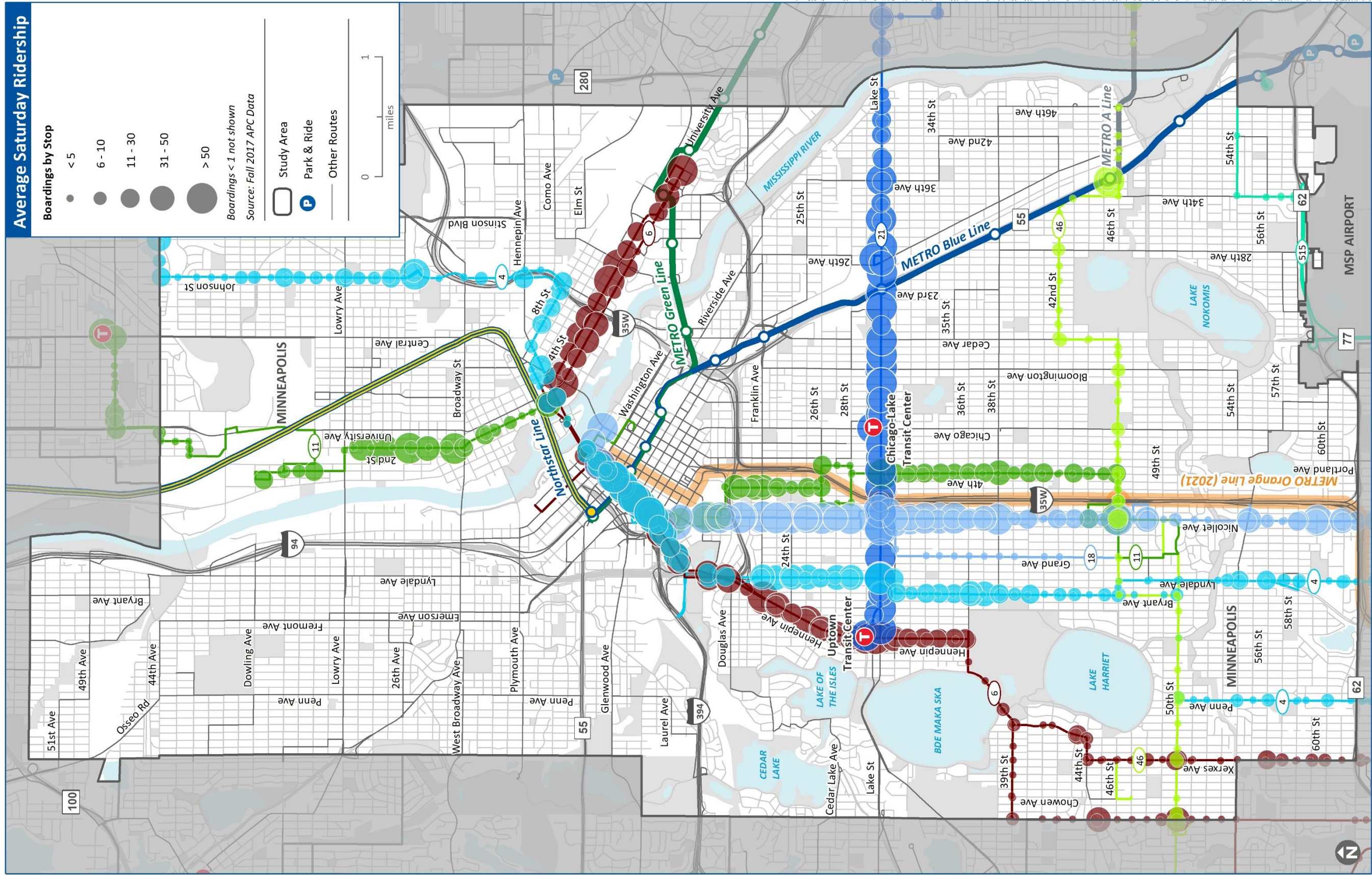






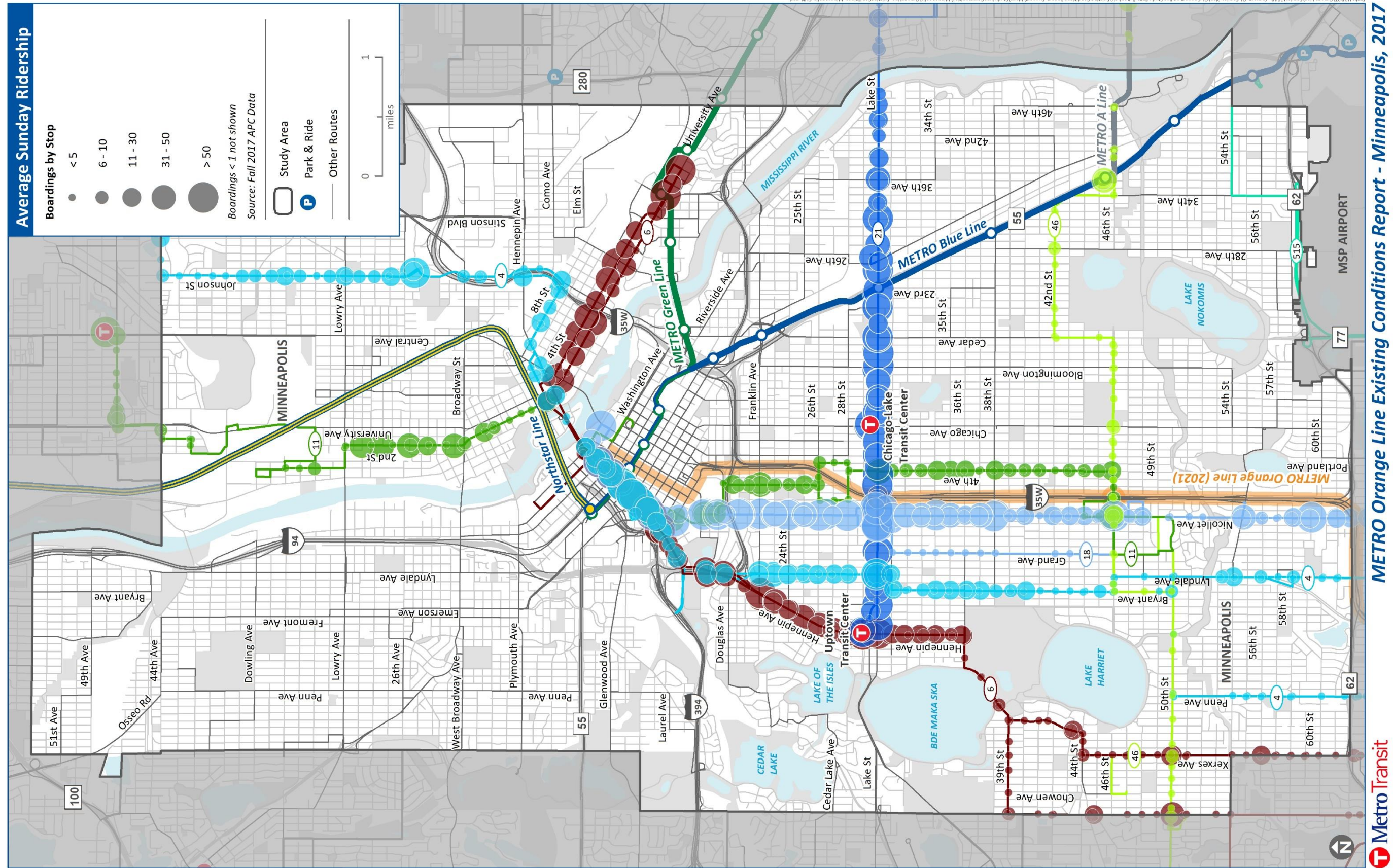
METRO Orange Line Existing Conditions Report - Minneapolis, 2017



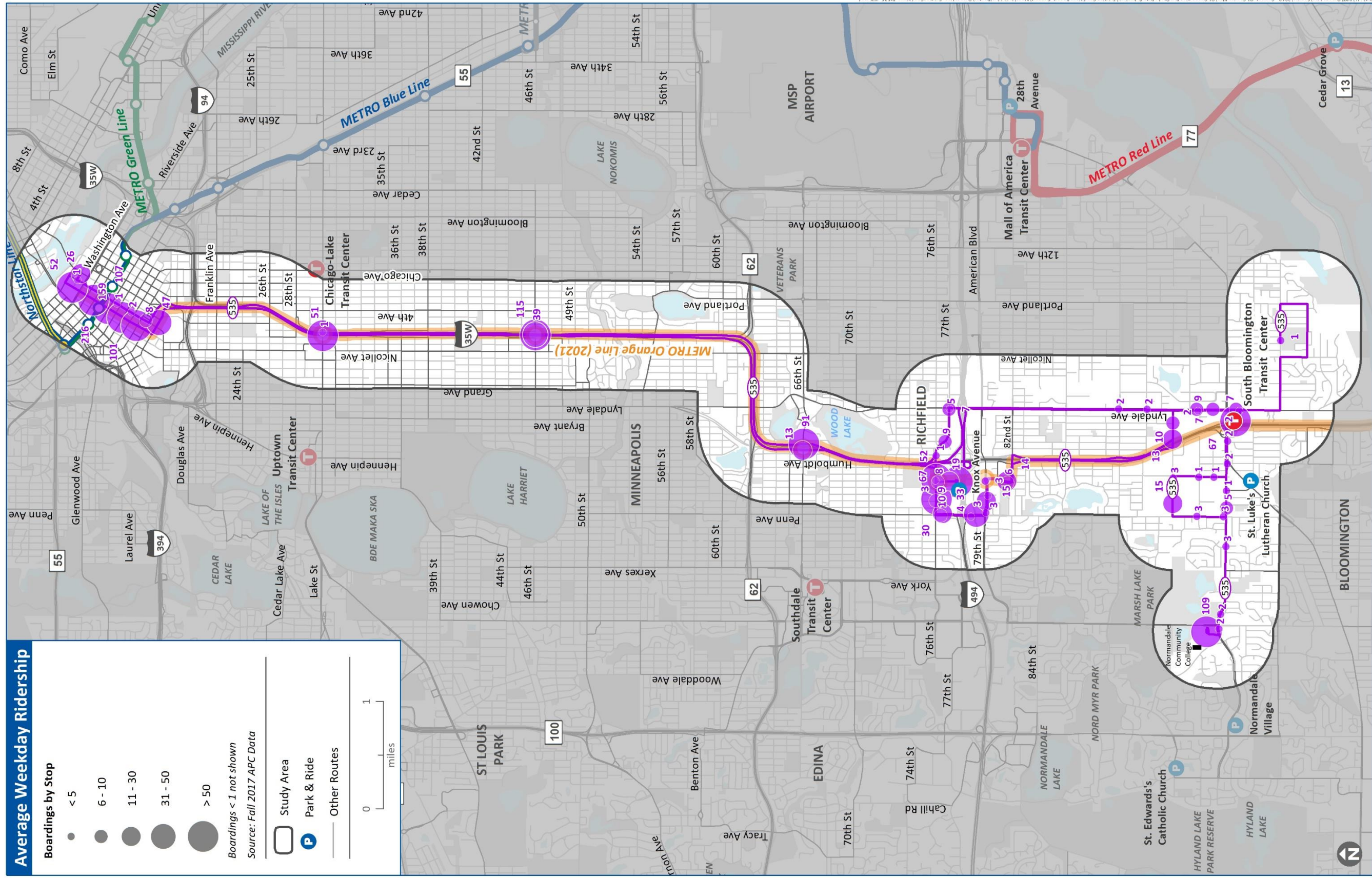


METRO Orange Line Existing Conditions Report - Minneapolis, 2017





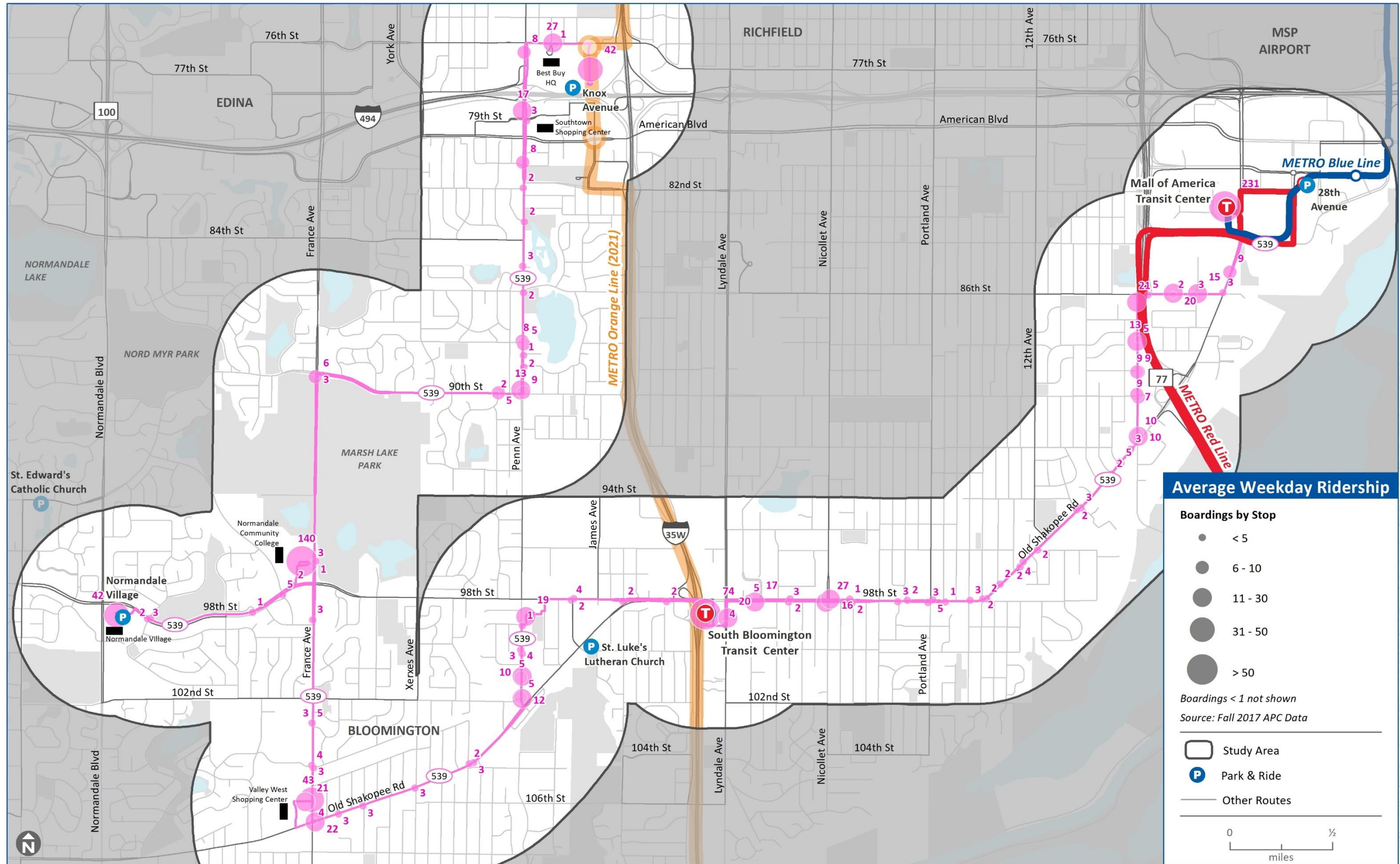
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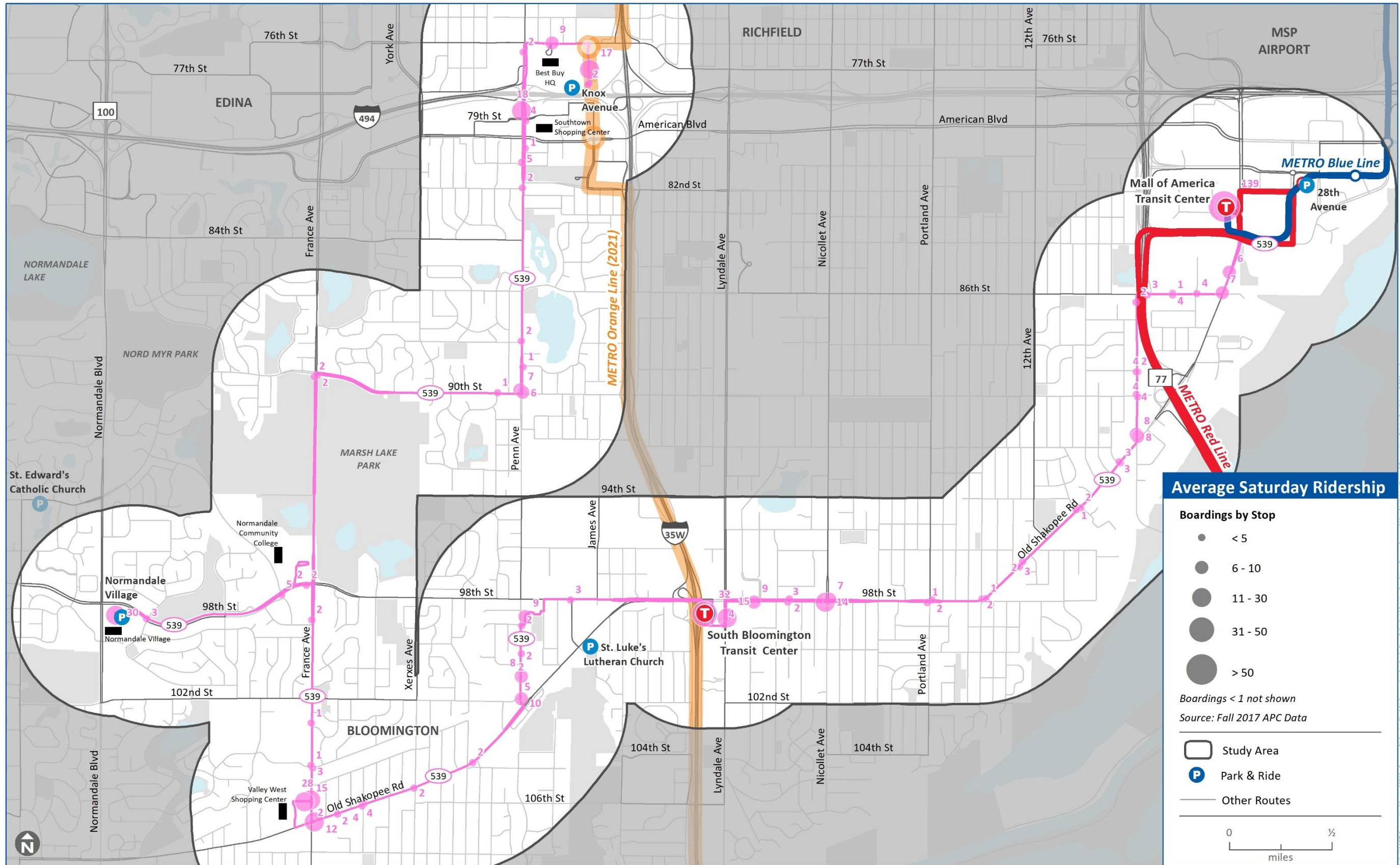
METRO Orange Line Existing Conditions Report, 2017 - Route 535



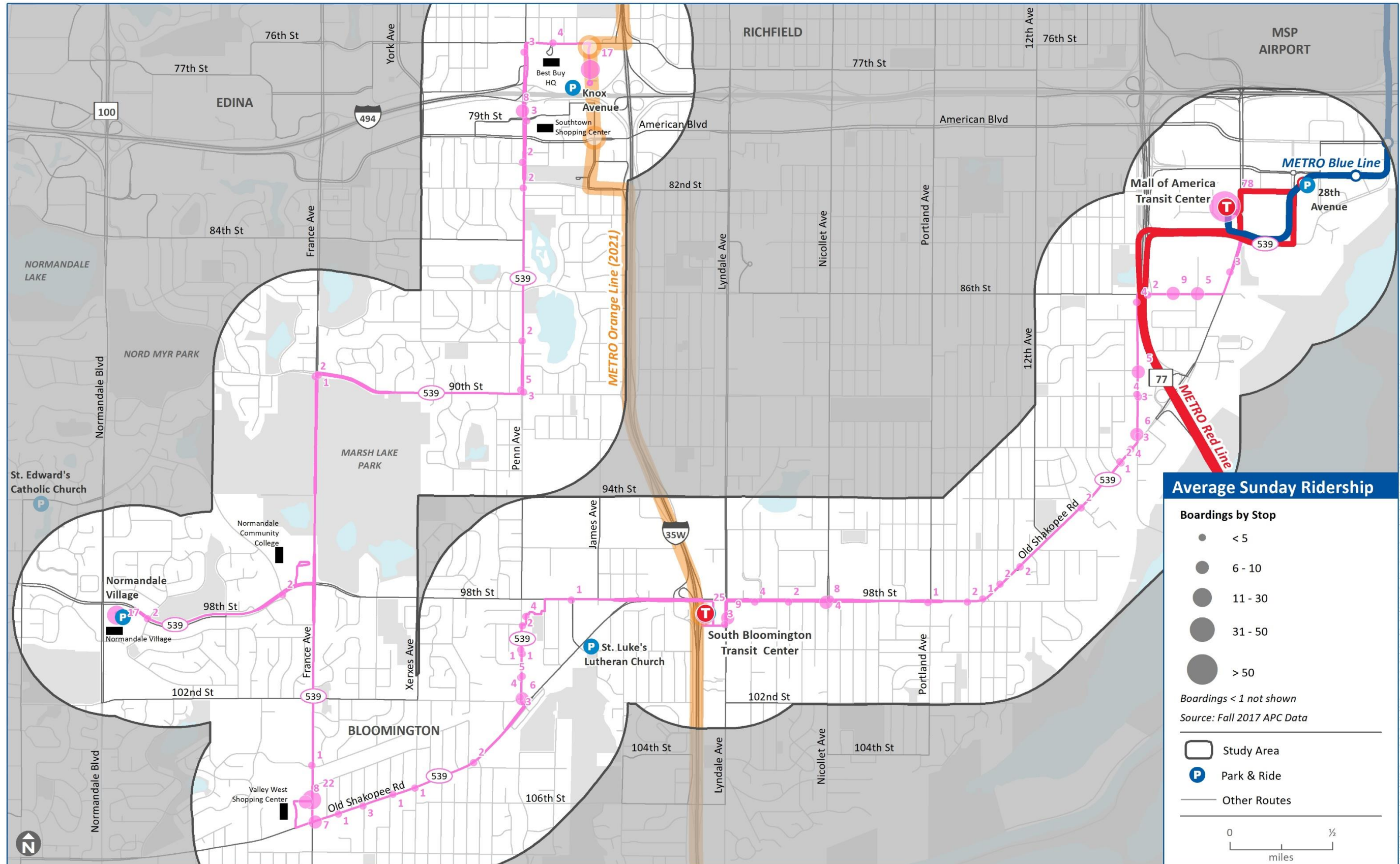
Appendix – Map of Route 539 Weekday Boardings by Stop



Appendix – Map of Route 539 Saturday Boardings by Stop



Appendix – Map of Route 539 Sunday Boardings by Stop



Appendix – Map of Route 542 Weekday Boardings by Stop

