2015 Service and Facilities Standards Monitoring

In Compliance with FTA Circular 4702.1B

Metro Transit

SRF Consulting Group, Inc. | Engineers Planners Designers

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Executive Summary

In order to comply with Federal Transit Administration (FTA) Title VI guidelines, federal funding recipients are required to adopt quantitative system standards necessary to guard against discriminatory service design and operations decisions. The FTA requires transit systems to monitor service standards at least once every three years by comparing the level and quality of service between minority routes and non-minority routes and between low-income routes and non-low-income routes to ensure that the current distribution of service does not result in discrimination against minority and/or low-income populations.

Technical Analysis of Service Standards and Policies

This analysis reviewed the distribution and quality of service for each of the standards and policies listed below. Metro Transit's policies for each of these standards and policies are described in the *2030 Transportation Policy Plan* (TPP) and the *Regional Transitway Guidelines*.

- Vehicle Load
- Vehicle Headway
- On-Time Performance
- Service Availability
    - Route Spacing
    - Midday Headway
    - Bus Stop Spacing
- Transit Amenities
    - Bus Shelter Distribution
    - Customer Information
    - Transit Facility Amenities
- Vehicle Assignment

The analysis was completed for bus, light rail, and commuter rail (Northstar) modes independently. The results for light rail and Northstar are shown primarily for informational purposes. Metro Transit has only one commuter rail route and both of the light rail lines are identified as minority and low-income routes. It is therefore impossible to make comparisons between route designations as it is with the bus system.

Disparate Impact, Disproportionate Burden, and the Four-Fifths Threshold

The FTA defines "disparate impacts" as facially neutral policies or practices that disproportionately affect members of a group identified by race, color, or national origin, and the recipient's policy or practice lacks a substantial legitimate justification. Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color, or national origin in programs receiving federal financial assistance. Title VI states, "no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any

program or activity receiving Federal financial assistance." President Clinton's Executive Order 12898 extends similar protections to low-income persons.

If the results of this evaluation indicate a potential for disparate impacts, further investigation is required. Metro Transit has defined its disparate impact threshold using the "four-fifths rule." The four-fifths rule states that there may be evidence of disparate impacts if:

- Benefits are being provided to minority populations at a rate less than 80 percent (four-fifths) of the benefits being provided to non-minority populations, or
- Adverse effects are being borne by non-minority populations at a rate less than 80 percent (four-fifths) of the adverse effects being borne by minority populations.

The four-fifths rule originates from employment law, but is applied in this setting to compare the distribution of benefits and/or adverse impacts among various population groups. The four-fifths rule suggests that a selection rate for any racial, ethnic, or gender group that is less than four-fifths or 80 percent of the rate for the group with the highest selection rate will be regarded as evidence of adverse impact. Although it is a "rule of thumb" and not a legal definition, it is a practical way for identifying adverse impacts that require mitigation or avoidance. Metro Transit's decision to use the four-fifths rule was subject to a formal public outreach process before being adopted by the Metropolitan Council in 2013.

Metro Transit uses a similar approach when comparing the distribution of benefits and adverse impacts for low-income and non-low-income populations. However, when the distributions for low-income populations fall outside of the four-fifths threshold, this is referred to as a disproportionate burden rather than a disparate impact.

In this analysis, if the quantitative results indicate that service standard compliance in predominantly minority/low-income areas is less than 80 percent of the compliance rate for non-minority/non-low-income areas, this could be evidence of disparate impacts or disproportionate burdens. In these cases, additional analysis will be conducted and potential mitigation measures will be identified if necessary.

Summary of Results

A summary of the results of each evaluation is shown in Table 23. No disparate impacts to minority populations were identified in these evaluations. Only one potential disproportionate burden to low-income populations was identified: Customer Information (System Maps). This result is discussed further in the next section.

Table 1. Summary of Results

Standard	Minority Results	Low-Income Results
Vehicle Load	No Disparate Impacts	No Disproportionate Burdens
Vehicle Headway	No Disparate Impacts	No Disproportionate Burdens
On-Time Performance	No Disparate Impacts	No Disproportionate Burdens
Service Availability	-	-
Route Spacing	No Disparate Impacts	No Disproportionate Burdens
Midday Service Availability	No Disparate Impacts	No Disproportionate Burdens
Stop/Station Spacing	No Disparate Impacts	No Disproportionate Burdens
Transit Amenities	-	-
Bus Shelter Amenities	No Disparate Impacts	No Disproportionate Burdens
Customer Information	No Disparate Impacts	Potential Disproportionate Burden Identified
Transit Facilities	No Disparate Impacts	No Disproportionate Burdens
Vehicle Assignment	No Disparate Impacts	No Disproportionate Burdens

Additional Analysis

Customer Information: System Map Displays

The results of this analysis identified a potential disproportionate burden to low-income populations. Full system maps are displayed at only 23 locations throughout the system and most of these maps are displayed at suburban park-and-rides that are served primarily by non-low-income routes. While some system maps are also displayed at urban transit centers and other facilities served by low-income routes, this is not enough to counterbalance the impact of the park-and-ride system maps.

The distribution of system map displays is currently being reevaluated by Metro Transit staff. System maps require a large amount of space and are difficult to maintain because they change quarterly. Local area maps showing all nearby routes are located on all LRT and Northstar station platforms. These maps show the immediate area around a stop or station. Local maps, which include common destinations in the area and show connecting bus routes, show more detail for customers trying to navigate the area.

Metro Transit has also embarked on a system-wide program to improve customer information at all transit stops. As of Fall 2015 approximately 2300 stops, including stops along predominantly low-income and minority areas, have been upgraded. This project includes providing a map of the route(s) serving a particular stop, shelter or transit center at all bus stops with ten or more boardings a day. By 2017, approximately 25% of all bus stops (approximately 3,000 locations) will feature route level maps.

Service Availability: Route Spacing (Urban Crosstown, Market Area I)

The results of the analysis for this standard did not identify disparate impacts to minority populations or disproportionate burdens to low-income populations. However, the results for the minority analysis were close (82.9%) to violating the four-fifths rule and warrant further discussion.

The coverage of the urban crosstown routes in Market Area I is substantially lower than the coverage for the other route categories. This is primarily due to the limited crosstown service in portions of Saint Paul east of downtown and south of the Mississippi River. While these areas are heavily covered by urban radial service, the configuration of the street network and a number of natural barriers make the implementation of crosstown service difficult. Metro Transit is aware of these crosstown service gaps and makes efforts to restructure service to provide adequate transit service when feasible. Two new urban crosstown routes began operating in 2014 in an effort to improve crosstown coverage.

Introduction

In order to comply with Federal Transit Administration (FTA) Title VI guidelines, federal funding recipients are required to adopt quantitative system standards necessary to guard against discriminatory service design and operations decisions. The FTA requires transit systems to monitor service standards at least once every three years by comparing the level and quality of service between minority routes and non-minority routes and between low-income routes and non-low-income routes to ensure that the current distribution of service does not result in discrimination against minority and/or low-income populations.

The FTA requires agencies to adopt service standards and suggests the standards include (but are not limited to) vehicle assignment, vehicle load, vehicle headway, on-time performance, service availability, and distribution of transit amenities. This review uses these themes to compare service design with standards defined in the Metropolitan Council's *2030 Transportation Policy Plan* (TPP). While an update to this document, the *2040 Transportation Policy Plan*, was adopted by the Metropolitan Council on January 14, 2015, it was determined that the standards included in the 2030 TPP would be more appropriate for this analysis as they represent the service standards and policies that were in place during the period of time for which data was collected.

For this analysis, the rates of compliance were compared between minority and non-minority routes/areas and between low-income and non-low-income routes/areas for the following Metro Transit standards and policies.

- Vehicle Load
- Vehicle Headway
- On-Time Performance
- Service Availability
    - Route Spacing
    - Midday Headway
    - Bus Stop Spacing
- Transit Amenities
    - Bus Shelter Distribution
    - Customer Information
    - Transit Facility Amenities
- Vehicle Assignment

This analysis included fixed routes directly operated by Metro Transit, those operated under contract to the Metropolitan Council, and the METRO Red Line Bus Rapid Transit. The Metro Transit Service Area used for this analysis was defined as the extents of the Transit Capital Levy Communities excluding those areas served by suburban transit authorities. Unless otherwise noted, the data used for this analysis is from the Fall 2014 pick.

Title VI and Environmental Justice

Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color, or national origin in programs receiving federal financial assistance. Title VI states, "no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

In 1994, President Clinton issued Executive Order 12898, which states that each federal agency "shall make achieving environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." Through this Executive Order, Title VI was identified as one of several Federal laws that should be applied "to prevent minority communities and low-income communities from being subject to disproportionately high and adverse environmental effects."

To provide direction to recipients of federal funding, the FTA issued Circular 4702.1B, Title VI Requirements and Guidelines for Federal Transit Administration Recipients, in 2012. The Circular outlines Title VI evaluation procedures for recipients of FTA-administered transit program funds and includes guidance for a variety of equity evaluations. This evaluation satisfies the FTA requirement to monitor transit service standards for public transportation agencies operating 50 or more vehicles in peak service and located in an urbanized area of 200,000 or more in population.

Defining Low-Income and Minority Populations

This review uses FTA definitions related to Title VI-protected populations and geographic areas. The FTA guidelines state recipients should evaluate services by comparing predominantly minority/low-income areas with predominantly non-minority/non-low-income areas. Predominantly minority and low-income are further defined and described in this section.

Predominantly Minority Areas

The FTA defines a minority person as one who self-identifies as American Indian/Alaska Native, Asian, Black or African American, Hispanic or Latino, and/or Native Hawaiian/Pacific Islander. A predominantly minority area is defined as one where the proportion of minority persons exceeds the proportion of minority persons in the overall service area. Based on 2010 U.S. Decennial Census data, the average percentage of minority persons in the Metro Transit service area is 27.6 percent. Of the 36,735 blocks inside the service area, 7,744 are identified as predominantly minority using this definition. Predominantly minority block groups in the service area are shown in Figure 1.

Predominantly Low-Income Areas

While low-income populations are not an explicitly protected class under Title VI, the FTA recognizes the inherent overlap between Title VI and Environmental Justice principles and requires transit providers to evaluate the impact of service and fare changes to low-income populations and to identify any disproportionate burden placed on those populations by the proposed changes. The FTA defines a low-income person as one whose household income is at or below the poverty guidelines set by the Department of Health and Human Services (DHHS). DHHS poverty thresholds are based on household size and the number of related children less than 18 years of age. The 2013 poverty thresholds used for the data in this evaluation are summarized in Table 2.

Table 2. 2013 DHHS Poverty Thresholds

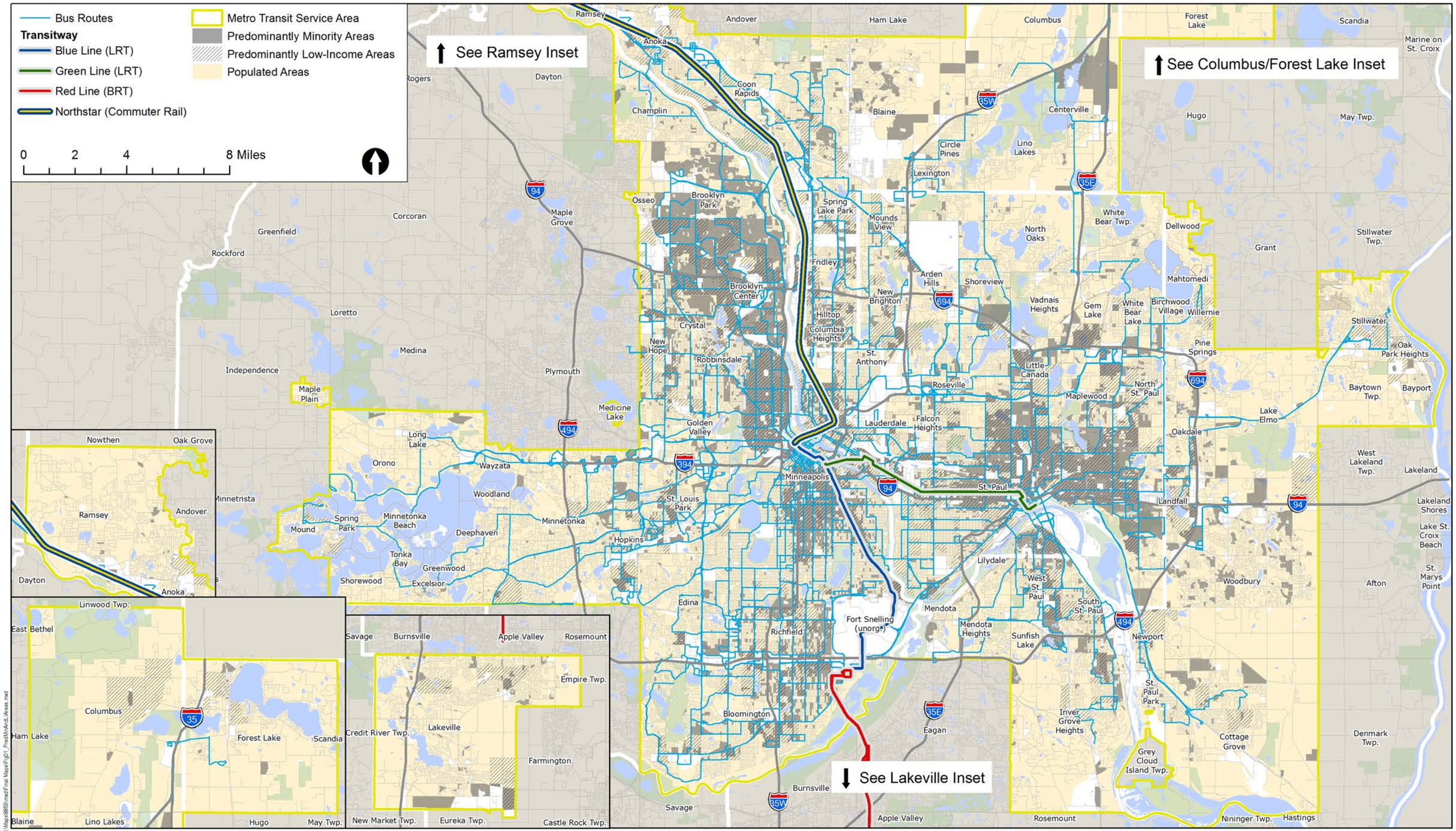
Persons in Family	Threshold for 48 Contiguous States and D.C.
1	$11,490
2	$15,510
3	$19,530
4	$23,550
5	$27,570
6	$31,590
7	$35,610
8	$39,630
For each additional person add	$4,020

Source: U.S. Department of Health and Human Services (http://aspe.hhs.gov/poverty/13poverty.cfm)

Information on minority populations is available at the census block level from the 2010 U.S. Decennial Census. However, information on low-income populations is available only at the census block group level from the 2013 American Community Survey 5-year Estimates. Census block groups and blocks differ in their geographic makeup. Census blocks are the smallest geographic unit used by the U.S. Census Bureau and are bounded by roadways or water features in urban areas. A census block group is typically made up of a cluster of approximately 40 blocks.

To simplify the analysis, low-income populations were estimated at the census block level. The total population of each block was multiplied by the percentage of low-income population in its parent block group. This approach assumes that the percentage of low-income population is uniform throughout the block group, but allows for a more precise analysis than an analysis using the block groups as a whole. This approach also allows for zero-population blocks to be identified and displayed appropriately in maps and figures.

A predominantly low-income area is defined as one where the proportion of low-income persons exceeds the population of low-income persons in the overall service area. Based on the 2013 American Community Survey estimates, the average percentage of low-income persons in the Metro Transit service area is 13.3 percent. Of the 36,735 blocks inside the service area, 11,171 are identified as predominantly minority using this definition. Predominantly low-income block groups in the service area are shown in Figure 1.



Predominantly Minority and Low-Income Areas

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Figure 1

Transit Market Areas

Several of the standards included in this review differ based on the Transit Market Area being evaluated. The Metropolitan Council's 2030 TPP defines five unique Transit Market Areas based on a combination of population density, employment density, and auto availability. The index is calculated using the following formula:

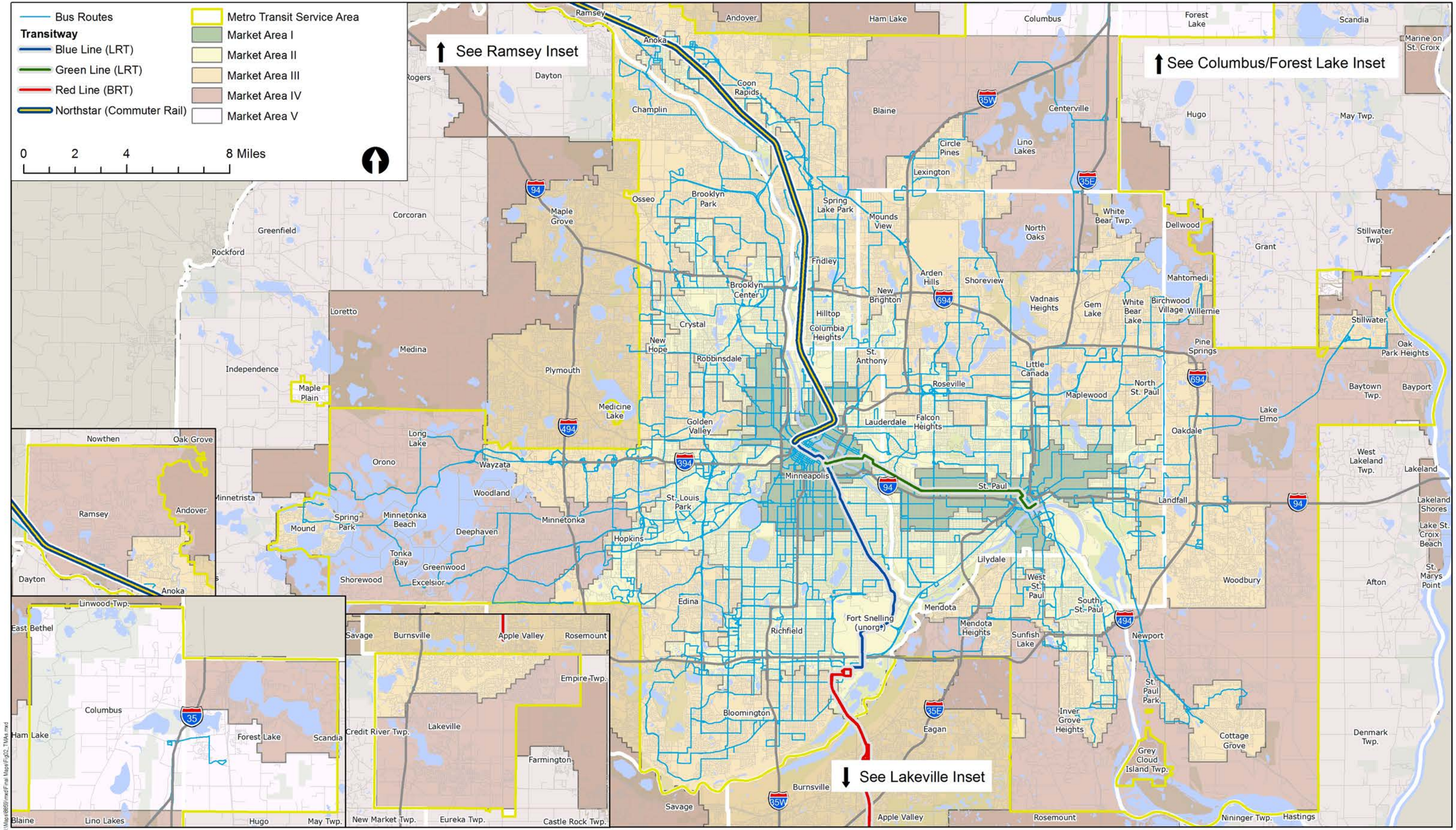
$$\begin{bmatrix} Transit \\ Market \\ Index \end{bmatrix} = \frac{\begin{pmatrix} Total \\ Population \end{pmatrix} + \left(\frac{Total}{\frac{Employment}{3}} \right) + \left(\begin{bmatrix} Population \\ Over\ Age\ 16 \end{bmatrix} - \begin{bmatrix} Available \\ Automobiles \end{bmatrix} \right)}{\begin{matrix} Acreage\ of\ population\ land\ uses \\ (including\ industrial, institutional, \\ commercial, and\ residential\ uses) \end{matrix}}$$

Market Areas define the type of service best suited to an area. Market Area I has the highest concentration of people likely to use transit, and as such has the highest levels of transit service. Market Area V has the lowest concentration of people and jobs and thus can only support the lowest levels of transit service. The relationship between Transit Market Area classification and the Transit Market Index score is shown in Table 3.

Table 3. Transit Market Area Characteristics

Transit Market Area	Transit Market Index
1	Above 20
2	Between 10 and 20
3	Between 5 and 10
4	Between 1 and 5
5	Less Than 1

Many of Metro Transit's transit design standards are custom-tailored for each transit Market Area. These standards represent typical design guidelines for transit service, though exceptions exist based on specific conditions. Market Area-specific standards are identified in this review where applicable and illustrated in the included figures. The locations of Market Areas throughout the region are shown in Figure 2.



Transit Market Areas

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Figure 2

Disparate Impact, Disproportionate Burden, and the Four-Fifths Threshold

The FTA defines "disparate impacts" as facially neutral policies or practices that disproportionately affect members of a group identified by race, color, or national origin, and the recipient's policy or practice lacks a substantial legitimate justification. If the results of this evaluation indicate a potential for disparate impacts, further investigation is required. Metro Transit has defined its disparate impact threshold using the "four-fifths rule." The four-fifths rule states that there may be evidence of disparate impacts if:

- Benefits are being provided to minority populations at a rate less than 80 percent (four-fifths) of the benefits being provided to non-minority populations, or
- Adverse effects are being borne by non-minority populations at a rate less than 80 percent (four-fifths) of the adverse effects being borne by minority populations.

The four-fifths rule originates from employment law, but is applied in this setting to compare the distribution of benefits and/or adverse impacts among various population groups. The four-fifths rule suggests that a selection rate for any racial, ethnic, or gender group that is less than four-fifths or 80 percent of the rate for the group with the highest selection rate will be regarded as evidence of adverse impact. Although it is a "rule of thumb" and not a legal definition, it is a practical way for identifying adverse impacts that require mitigation or avoidance. Metro Transit's decision to use the four-fifths rule was subject to a formal public outreach process before being adopted by the Metropolitan Council in 2013.

Metro Transit uses a similar approach when comparing the distribution of benefits and adverse impacts for low-income and non-low-income populations. However, when the distributions for low-income populations fall outside of the four-fifths threshold, this is referred to as a disproportionate burden rather than a disparate impact.

In this analysis, if the quantitative results indicate that service standard compliance in predominantly minority/low-income areas is less than 80 percent of the compliance rate for non-minority/non-low-income areas, this could be evidence of disparate impacts or disproportionate burdens. In these cases, additional analysis will be conducted and potential mitigation measures will be identified if necessary.

Designation of Predominantly Minority/Low-Income Routes

For the purposes of this analysis, all routes were defined as either predominantly minority or predominantly non-minority and either predominantly low-income or predominantly non-low-income. The FTA Circular 4702.1B defines a minority transit route as "one in which at least one-third of the revenue miles are located in a census block, census block group, or traffic analysis zone where the percentage minority population exceeds the percentage minority population in the service area." The same criteria apply to the definition of low-income routes. However, the FTA does allow some modification to this standard to account for routes that travel through areas which they do not make stops, such as commuter routes.

Local Routes and Express Routes Not Serving Park-and-Rides

This evaluation used a coverage-based approach for the designation of minority and low-income routes. The service area of each route was defined as a one-quarter mile buffer around each bus stop served by that route. Transitway routes such as the Green Line and Blue Line followed a similar approach using a one-half mile buffer for light rail and bus rapid transit stations. These buffers were then compared to the geographic locations of predominantly minority and predominantly low-income areas.

For each route, the total buffer area serving predominantly minority and low-income areas was calculated as a proportion of the route's total service area. This approach has the advantage of automatically excluding non-stop route segments, such as freeway sections of express routes. Routes with at least one-third of their service area in predominantly minority areas were designated as minority routes. Routes with at least one-third of their service area in predominantly low-income areas were designated as low-income routes.

The following steps were also taken to ensure that the service area of each route was accurately represented:

- The bus stop buffers were dissolved for each unique route and route pattern. This was done to avoid the double counting of intersecting buffers at closely spaced stops.
- Each buffer was weighted by the count of weekly trips to account for variations in service frequency for branches, shortlines, etc. This step ensures that high-frequency portions of routes have a higher impact on the demographic make-up of the routes than infrequently served areas.

Express Routes Serving Park-and-Rides

The areas immediately surrounding park-and-ride facilities are not necessarily representative of the demographics of the users of that facility. The designation of routes serving park-and-rides was partially based on the home locations of park-and-ride users at each park-and-ride. Home locations (aggregated to the nearest census block) from the most recent *Regional Park-and-ride System Survey Report* were used to supplement the demographic makeup of each route. The calculation of the percent of each route serving predominantly minority or low-income populations was based on the following formula:

$$\begin{bmatrix} Route \\ Minority \\ Proportion \end{bmatrix} = \frac{\left(\begin{bmatrix} Local \\ Ridership \end{bmatrix} \times \begin{bmatrix} \%\ of\ Service \\ Area\ in \\ Predominantly \\ MinorityAreas \end{bmatrix}\right) + \left(\begin{bmatrix} Park \\ and\ Ride \\ Ridership \end{bmatrix} \times \begin{bmatrix} \%\ of\ Park\ and\ Ride \\ User\ Home\ Locations \\ in\ Predominantly \\ Minority\ Areas \end{bmatrix}\right)}{Total\ Route\ Ridership}$$

A similar formula was used for the identification of low-income routes. A listing of each Metro Transit route and its minority and low-income route designation status is provided in Appendix A.

Technical Analysis

The following sections describe the analysis and results for the evaluation of each of the service standards required by the FTA. Where possible, the minority and low-income route definitions noted previously are used to compare rates of compliance. Results are included for bus, light rail, and commuter rail (Northstar) modes independently. The results for light rail and Northstar are shown primarily for informational purposes. Metro Transit has only one commuter rail route and both of the light rail lines are identified as minority and low-income routes. It is therefore impossible to make comparisons between route designations as it is with the bus system.

One additional mode provided by Metro Transit is the Red Line bus rapid transit (BRT) route. With the exception of the transit facility amenities analysis, the Red Line was incorporated into the analysis of the bus system standards. However, the Red Line service characteristics were evaluated against the separate BRT service standards where applicable. For example, the minimum headway standards for BRT are different from the standards for regular bus service, but the overall rates of compliance for bus route headways included both BRT and regular route service. For the transit facility amenities analysis, the Red Line stations were included with the other transitway stations including light rail and commuter rail.

Vehicle Load

The Title VI Circular states the following in regard to vehicle load standards:

> Vehicle load can be expressed as the ratio of passengers to the total number of seats on a vehicle. For example, on a 40-seat bus, a vehicle load of 1.3 means all seats are filled and there are approximately 12 standees. A vehicle load standard is generally expressed in terms of peak and off-peak times.

Analysis

The regional standards for maximum vehicle loads are outlined in the 2030 TPP and the Metropolitan Council's Regional Transitway Guidelines. Maximum loads are expressed as a percentage of the seats available on each vehicle. It does not take into consideration seats displaced for wheelchairs or other large items, such as strollers. Metro Transit's maximum vehicle load standards are summarized in Table 4.

Table 4. Maximum Vehicle Load Standards

Mode	Peak Standards 6 – 9:00 a.m. 3 – 6:30 p.m.	Off-Peak Standards (All Other Times)
Bus – Local (Radial and Crosstown) and BRT	125%	100%
Bus – Limited Stop	115%	100%
Bus – Express	100%	100%
Light Rail	200%	200%
Northstar Commuter Rail	100%	100%

The TPP states that the maximum load standards are flexible on the fringe of the peak period. It also states that during the peak period, the standards represent the maximum customer load averaged over a 15-minute period on a consistent basis. In the off-peak, the standards represent the maximum customer load averaged over a 30-minute period on a consistent basis. However, for the purposes of this analysis, overloads were identified for each individual trip based on the load standards shown above without using the 15- and 30-minute average values. This represents a higher standard than what is dictated in the TPP.

This evaluation of the bus system used data from Metro Transit/Metropolitan Council's automatic passenger counter (APC) system to examine vehicle loads. Weekday APC data was collected and evaluated for the period from September 3, 2014 through December 12, 2014. Loads on Saturday and Sunday were excluded from the analysis since ridership is generally lower than weekday ridership and weekend overloads are rare. Similar vehicle load data is not available for LRT or Northstar service. Periodic in-person spot checks of the LRT system are conducted by Metro Transit staff to assess ridership and vehicle load patterns. Vehicle load on Northstar vehicles is monitored by the conductors. No significant overload issues have been identified for either service during standard (non-event-related) service.

For each trip, the maximum passenger load was compared to the number of seats available on the bus type assigned to that trip. Overloaded trips were identified based on the maximum vehicle load standards summarized above. The number of total trips and overloaded trips were then aggregated by route and scheduled trip number. On average, 50 trips were observed for each unique trip during this period.

Occasional overloads are to be expected due to natural variations in transit demand and special events. Metro Transit considers overloads to be an issue needing to be addressed if they are "consistent." Individual route trips are considered to be "consistently overloaded" if they experience an overload two or more days per week. Because a trip has an equal probability of being sampled on any weekday, this review considered a trip that was overloaded 40 percent or more of the time (two days per five-day week) to be consistently overloaded.

Two approaches were used to evaluate the vehicle load data:

- The first approach compared the overall percentage of overloaded trips on minority or low-income routes to the percentage of overloaded trips on non-minority or non-low-income routes.
- The second approach is similar to the first, but used the percent of trips that are consistently overloaded as the comparison rather than the overall rate of overloaded trips.

There is no load data for light rail or Northstar. Northstar is not equipped with APCs. On-board conductors review loads daily. Except for special event service, there are no overloads reported. Light rail is reviewed for overloads periodically by manual checks. No consistent overloads have been observed. Some of the light rail vehicles have been equipped with APCs, but the system is not yet working reliably enough to be used to detect overloads.

Results

Out of the 386,411 observed trips included in the data, only 10,451 (2.7 percent) were found to be overloaded. Table 5 summarizes the percent of all observed trips with overloads by mode for minority routes, non-minority routes, low-income routes, and non-low-income routes.

- Minority route trips experienced an overall overload rate of 2.66 percent. This is less than the average of 2.82 percent for non-minority routes.
- Low-income route trips also experienced an overall overload rate of 2.66 percent. This is less than the average of 2.87 percent for non-low-income routes.

These results indicate that the proportion of overloaded trips is higher for non-minority and non-low-income routes than it is for minority and low-income routes.

Table 5. Percent of All Observed Trips with Overloads

Mode	Minority Routes	Non-Minority Routes	Low-Income Routes	Non-Low-Income Routes
Bus	2.66%	2.82%	2.66%	2.87%
Light Rail	No Data	n/a	No Data	n/a
Northstar Commuter Rail	n/a	No Data	n/a	No Data

Table 6 summarizes the percent of all observed trips that are consistently overloaded by mode for minority routes, non-minority routes, low-income routes, and non-low-income routes.

- Minority bus trips experienced a consistently overloaded rate of 0.36 percent. This is less than the average of 0.68 percent for non-minority routes.
- Low-income bus trips experienced a consistently overloaded rate of 0.43 percent. This is less than the average of 0.62 percent for non-low-income routes.

Table 6. Percent of Trips Consistently Overloaded

Mode	Minority Routes	Non-Minority Routes	Low-Income Routes	Non-Low-Income Routes
Bus	0.36%	0.68%	0.43%	0.62%
Light Rail	No Data	n/a	No Data	n/a
Northstar Commuter Rail	n/a	No Data	n/a	No Data

The results of these analyses indicate that minority and low-income routes experience fewer consistently overloaded trips as well as fewer overloaded trips overall compared to non-minority and non-low-income routes.

Based on this analysis, no potential for disparate impact to minority populations or disproportionate burden to low-income populations is identified for the vehicle load standard.

Vehicle Headway

The Title VI Circular states the following in regard to vehicle headway standards:

> Vehicle headway is the amount of time between two vehicles traveling in the same direction on a given line or combination of lines. A shorter headway corresponds to more frequent service. Vehicle headways are measures in minutes; service frequency is measures in vehicles per hour. Headways and frequency of service are general indications of the level of service provided along a route. Vehicle headway is one component of the amount of travel time expended by a passenger to reach his/her destination. A vehicle headway standard is generally expressed for peak and off-peak service as an increment of time (e.g., peak: every 15 minutes; and off-peak: every 30 minutes).

Analysis

The regional headway standards are outlined in the 2030 TPP and the Metropolitan Council's Regional Transitway Guidelines. Minimum headways are stated for peak and off-peak conditions for each of the five transit market areas. Metro Transit's minimum headway standards are summarized in Table 7.

Table 7. Minimum Headway Standards

Route Type	Market Area I	Market Area II	Market Area III	Market Area IV	Market Area V
Urban Radial	15' Peak 30' Off-Peak	30' Peak 60' Off-Peak	60' Peak 60' Off-Peak	n/a	n/a
Urban Crosstown	30' Peak 30' Off-Peak	30' Peak 60' Off-Peak	n/a	n/a	n/a
Suburban Local/Circulator	n/a	30' Peak 60' Off-Peak	60' Peak 90' Off-Peak	n/a	n/a
Express	30' Peak	30' Peak	3 Peak Trips	3 Peak Trips	n/a
Bus Rapid Transit	10' Peak 15' Off-Peak	10' Peak 15' Off-Peak	10' Peak 15' Off-Peak	n/a	n/a
Light Rail	10' Peak 15' Off-Peak	10' Peak 15' Off-Peak	n/a	n/a	n/a
Commuter Rail	5 Peak Trips	5 Peak Trips	5 Peak Trips	5 Peak Trips	n/a

For the purposes of this evaluation peak and off-peak headways were calculated using midday and p.m. peak period service levels. The 10:00 a.m. to 2:00 p.m. time period was used for midday service and the 3:00 to 6:30 p.m. time period was used for peak service.

Schedule information for the fall pick of 2014 was used as the baseline for this analysis. Using this data, the average peak and midday headways were calculated at each stop or station of each route. The headways at each stop and station were evaluated against the standards shown above to assess their compliance with the appropriate standard. This information was then aggregated to the route level to calculate the percentage of stops or stations along a route that are in compliance with the headway standards.

This analysis evaluated the headways for each route independently of all other transit service per Metro Transit's headway standards. A single stop or station may be used by multiple routes and have a combined headway that is much better than the headway of each individual route. The total number of unique combinations of route and stop/station will be greater than the total number of stops in the system

Results

Peak

Out of the 15,023 unique combinations of route and stop/station in the peak period, 10,856 (72.2 percent) meet the peak headway standards. Table 8 summarizes the percent of stops or stations meeting the headway standards for the peak period by mode for minority routes, non-minority routes, low-income routes, and non-low-income routes.

- 73.4 percent of the stops and stations on minority routes are compliant with the peak headway standards. This is higher than the compliance rate for non-minority routes at 70.4 percent.
- 75.3 percent of the stops and stations on low-income routes are compliant with the peak headway standards. This is higher than the compliance rate for non-low-income routes at 65.9 percent.

Table 8. Percent of Stops or Stations Meeting Peak Headway Standards

Mode	Minority Routes	Non-Minority Routes	Low-Income Routes	Non-Low-Income Routes
Bus	73.4%	70.4%	75.3%	65.9%
Light Rail	100%	n/a	100%	n/a
Northstar Commuter Rail	n/a	100%	n/a	100%

Midday

Out of the 9,489 unique combinations of route and stop/station in the midday period, 8,864 (93.4 percent) meet the headway standards. Table 9 summarizes the percent of stops or stations meeting the headway standards for the peak period by mode for minority routes, non-minority routes, low-income routes, and non-low-income routes.

- 92.8 percent of the stops and stations on minority routes are compliant with the midday headway standards. This is slightly lower than the compliance rate for non-minority routes at 94.6 percent, but is well within the four-fifths threshold:
  - 92.8% / 94.6% = 98.1% > 80% (four-fifths)
- 93.3 percent of the stops and stations on low-income routes are compliant with the midday headway standards. This is slightly lower than the compliance rate for non-low-income routes at 93.4 percent, but is well within the four-fifths threshold:
  - 93.3% / 93.4% = 99.9% > 80% (four-fifths)

Table 9. Percent of Stops or Stations Meeting Midday Headway Standards

Mode	Minority Routes	Non-Minority Routes	Low-Income Routes	Non-Low-Income Routes
Bus	92.8%	94.6%	93.3%	93.4%
Light Rail	100%	n/a	100%	n/a
Northstar Commuter Rail	n/a	100%	n/a	100%

The results of these analyses indicate that compliance with the peak and midday headway standards is largely similar between each of the route designations. Compared to non-minority and non-low-income routes, minority and low-income routes have a higher rate of compliance during the peak period and only a slightly lower rate of compliance during the midday period.

Based on this analysis, no potential for disparate impact to minority populations or disproportionate burden to low-income populations is identified for the vehicle headway standard.

On-Time Performance

The Title VI Circular states the following in regard to on-time performance standards:

> On-time performance is a measure of runs completed as scheduled. This criterion first must define what is considered to be "on time." For example, a transit provider may consider it acceptable if a vehicle completes a scheduled run between zero and five minutes late in comparison to the established schedule.

Analysis

Metro Transit's on-time performance goal for 2014 was 87.6 percent for bus service, 95 percent for Blue Line LRT, 90 percent for Green Line LRT, and 96 percent for Northstar Commuter Rail. Each mode has a unique definition for what is considered "on-time." The definitions are as follows:

- **Bus** service is considered on-time if it arrives at scheduled timepoints between 1 minute early and 5 minutes late.
- **Light rail** service is considered on-time if it arrives at stations between zero and 4 minutes late.
- **Commuter rail** service is considered on-time if a trip arrives or departs the Target Field Station (downtown Minneapolis) within 5 minutes of the scheduled time.

The analysis of bus service used weekday on-time performance data collected using automated vehicle locator (AVL) equipment on Metro Transit and Metropolitan Council buses and commuter trains. Weekend on-time performance is not as frequently an issue due to lower traffic volumes and congestion. The percent of trips arriving on-time was calculated for each route individually for the period from September 9, 2014 through December 14, 2014. The percent of on-time trips was then aggregated to each mode. The calculation for the percent of on-time trips for bus service was weighted by the number of daily trips available on each route to more accurately represent the on-time performance of the system. The analysis then compared the on-time performance results for minority and low-income route trips to the on-time performance results for non-minority and non-low-income route trips.

On-time performance data for LRT was evaluated using Supervisory Control and Data Acquisition (SCADA) data aggregated to a monthly summary for a similar time period.

Results

The total percentage of on-time trips by mode for minority routes, non-minority routes, low-income routes, and non-low-income routes is summarized in Table 10. A summary of the on-time performance for each route is provided in Appendix B.

- Minority bus trips experienced an on-time performance rate of 87.6 percent. This is higher than the average of 85.9 percent for non-minority routes.
- Low-income bus trips experienced an on-time performance rate of 87.3 percent. This is higher than the average of 86.2 percent for non-low-income routes.

Table 10. Percent of Trips Arriving On-Time

Mode	Minority Routes	Non-Minority Routes	Low-Income Routes	Non-Low-Income Routes
Bus	87.6%	85.9%	87.3%	86.2%
Light Rail	82.6%	n/a	82.6%	n/a
Northstar Commuter Rail	n/a	61.6%	n/a	61.6%

The on-time performance for light rail was significantly lower than the goal. Between Metro Transit's two light rail lines, the Blue Line performed significantly better with an average on-time rate of 92.1 percent during this period compared to the Green Line's on-time rate of 73.0 percent. The Green Line opened for service in June 2014 and was relatively new during the period of evaluation. For the first few months of service, travel speeds on the Green Line were slower than originally anticipated. Also, there were spacing issues to work out between Blue and Green lines where they share the same tracks in downtown Minneapolis. A number of efforts were undertaken to improve schedule adherence on the line including retiming of traffic signals along the corridor. The Green Line's on-time performance has risen from 58.0 percent in August to 84.9 percent in December and continues to improve.

On-time performance for Northstar was also lower than the goal. The Northstar commuter rail line operates on tracks owned by Burlington Northern Santa Fe (BNSF) and must coordinate its service with other freight trains using the line. Significant increases in freight shipments have led to severe congestion for all users. Improved coordination between Metro Transit and BNSF has helped to steadily improve the on-time performance rate. The on-time performance for the month of December was 95.5 percent.

Based on this analysis, no potential for disparate impact to minority populations or disproportionate burden to low-income populations is identified for the on-time performance standard.

Service Availability

The Title VI Circular states the following in regard to service availability standards:

> Service availability is a general measure of the distribution of routes within a transit provider's service area. For example, a transit provider might set a service standard to distribute route such that a specified percentage of all resident in the service area are within a one-quarter mile walk of bus service or a one-half mile walk of rail service. A standard might also indicate the maximum distance between stops or stations.

Metro Transit evaluates the service availability standard based on three separate criteria: route spacing, midday service availability, and bus stop spacing.

Analysis: Route Spacing

Metro Transit's route spacing standards are outlined in the *2030 TPP*. Standards are defined for urban radial, urban crosstown, and suburban local/circulator route types within Market Areas I and II. Route spacing in other Market Areas is designed to meet the specific demographics, geography, and transit needs of each area. Similarly express routes and limited stop route that function like express routes on freeway segments are designed according to the availability and demand of specific highway corridors. The function and purpose of the routes evaluated under the route spacing criteria are as follows:

- **Urban radial** routes are designed primarily to connect the downtown central business districts (CBD) to outlying areas by radiating out from the CBDs
- **Urban crosstown** routes do not provide service to the CBD and generally run perpendicular to the radial routes
- **Suburban Local/Circulator** routes are designed primarily to provide service to areas outside of the central urban areas.

Most routes will fall into one of the three categories listed above. However, in some cases a single route may function as multiple route types along its corridor. For example, a route may function as a radial in one section, but turn sharply so that it is providing crosstown service in another section. In some cases, individual segments of a route were assigned to either radial or crosstown service depending on their primary function in that segment. These segmented modifications were made to routes 21, 53, 61, and 64, but many other routes also fulfill this dual role.

The 2030 TPP route spacing standards are summarized in Table 11.

Table 11. Maximum Route Spacing Standards

Route Type	Market Area I	Market Area II
Urban Radial	0.5	1
Urban Crosstown	1	2
Suburban Local/Circulator	n/a	2

Individual analyses were conducted for urban radial routes in Market Area I, urban crosstown routes in Market Area I, and all local routes in Market Area II. Because service in Market Area II is provided with a mix of suburban local, urban radial, and urban crosstown routes, a universal standard of 1 mile spacing was used as a consistent measure for service availability, independent of route type designations. A higher level of scrutiny was applied in this review than is specified in the TPP standards.

Using GIS, buffers were created around each route based on the route type and the Market Area being analyzed. For example, a half-mile mile buffer (half of the 1 mile spacing standard) was created around urban crosstown routes in Market Area I. Areas that do not fall within this buffer area would not meet the maximum spacing standard for urban crosstown routes in Market Area I. For each analysis, the buffer coverage area was overlaid against census blocks in order to compare the proportion of predominantly minority areas meeting the route spacing standard to the proportion of non-minority areas meeting the standard. This same process was used to compare the proportion of predominantly low-income areas meeting the standard to the proportion of non-low-income areas meeting the standard.

Because urban crosstown routes by definition do not serve downtown areas, downtown census divisions were excluded from the Market Area I urban crosstown analysis. The boundaries of the Minneapolis and Saint Paul downtown areas were defined as the extents of the downtown fare zones.

Results: Route Spacing

The results of these analyses are shown in Table 12. The location of predominantly minority and low-income areas as they relate to the route coverage areas under each analysis are shown in Figure 3, Figure 4, and Figure 5.

Table 12. Percent of Areas Meeting Route Spacing Standards

Mode	Predominantly Minority Areas	Predominantly Non-Minority Areas	Predominantly Low-Income Areas	Predominantly Non-Low-Income Areas
Urban Radial (MA I)	92.4%	96.7%	92.3%	98.0%
Urban Crosstown (MA I)	70.5%	85.0%	73.7%	80.6%
All Local Routes (MA II)	98.8%	96.3%	97.2%	97.3%

Urban Radial (Market Area I)

Urban radial coverage in Market Area I is very high. Approximately 94 percent of all populated areas in Market Area I meet the urban radial route spacing standards.

- 92.4 percent of the predominantly minority areas in Market Area I meet the urban radial route spacing standard. This is lower than the proportion of non-minority areas meeting the standard at 96.7 percent, but is within the four-fifths threshold.
    - 92.4% / 96.7% = 96.0% > 80% (four-fifths)
- 92.3 percent of the predominantly low-income areas in Market Area I meet the urban radial route spacing standard. This is lower than the proportion of non-low-income areas meeting the standard at 98.0 percent, but is within the four-fifths threshold:
    - 92.3% / 98.0% = 94.2% > 80% (four-fifths)

Urban Crosstown (Market Area I)

The coverage of the urban crosstown routes in Market Area I is substantially lower than the coverage for the other route categories. The is primarily due to the limited crosstown service in portions of Saint Paul east of downtown and south of the Mississippi River. While these areas are heavily covered by urban radial service, the configuration of the street network and a number of natural barriers make the implementation of crosstown service difficult. Metro Transit is aware of these crosstown service gaps and makes efforts to restructure service to provide adequate transit service when feasible. Two new urban crosstown routes began operating in 2014 in an effort to improve crosstown coverage.

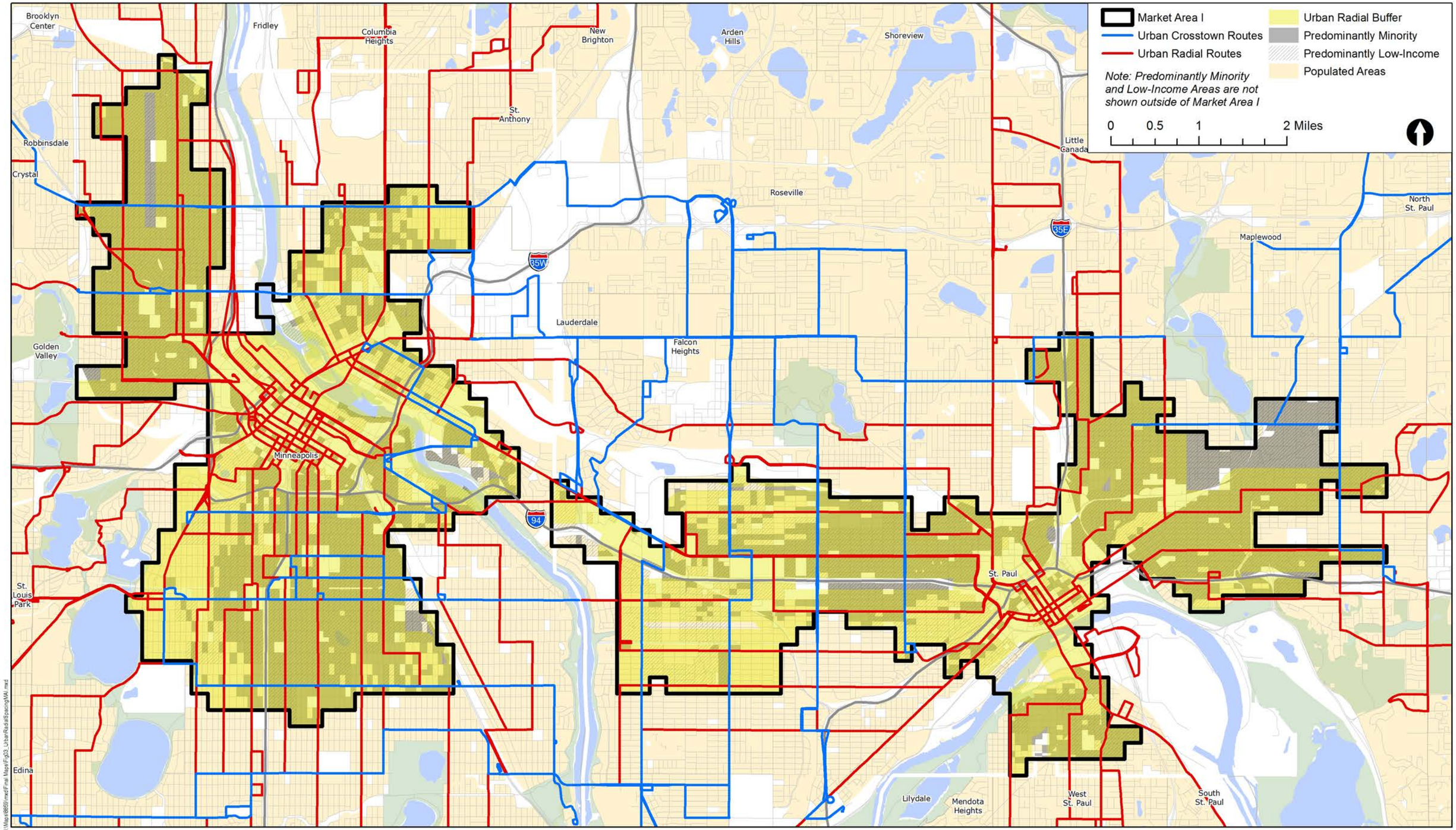
- 70.5 percent of the predominantly minority areas in Market Area I meet the urban crosstown route spacing standard. This is lower than the proportion of non-minority areas meeting the standard at 85.0 percent, but is within the four-fifths threshold:
    - 70.5% / 85.0% = 82.9% > 80% (four-fifths)
- 73.7 percent of the predominantly low-income areas in Market Area I meet the urban crosstown route spacing standard. This is lower than the proportion of non-low-income areas meeting the standard at 80.6 percent, but is within the four-fifths threshold:
    - 73.7% / 80.6% = 91.4% > 80% (four-fifths)

All Local Routes (Market Area II)

Local route service in Market Area II is also nearly universal. Approximately 95 percent of all populated areas in this Market Area II meet the suburban local/circulator route spacing standards.

- 95.4 percent of the predominantly minority areas in Market Area I meet the urban radial route spacing standard. This is higher than the proportion of non-minority areas meeting the standard at 94.4 percent.
- 94.8 percent of the predominantly low-income areas in Market Area I meet the urban radial route spacing standard. This is slightly lower than the proportion of non-low-income areas meeting the standard at 95.9 percent, but is within the four-fifths threshold:
    - 94.8% / 95.9% = 98.1% > 80% (four-fifths)

Based on this analysis, no potential for disparate impact to minority populations or disproportionate burden to low-income populations is identified for the service availability (route spacing) standard.



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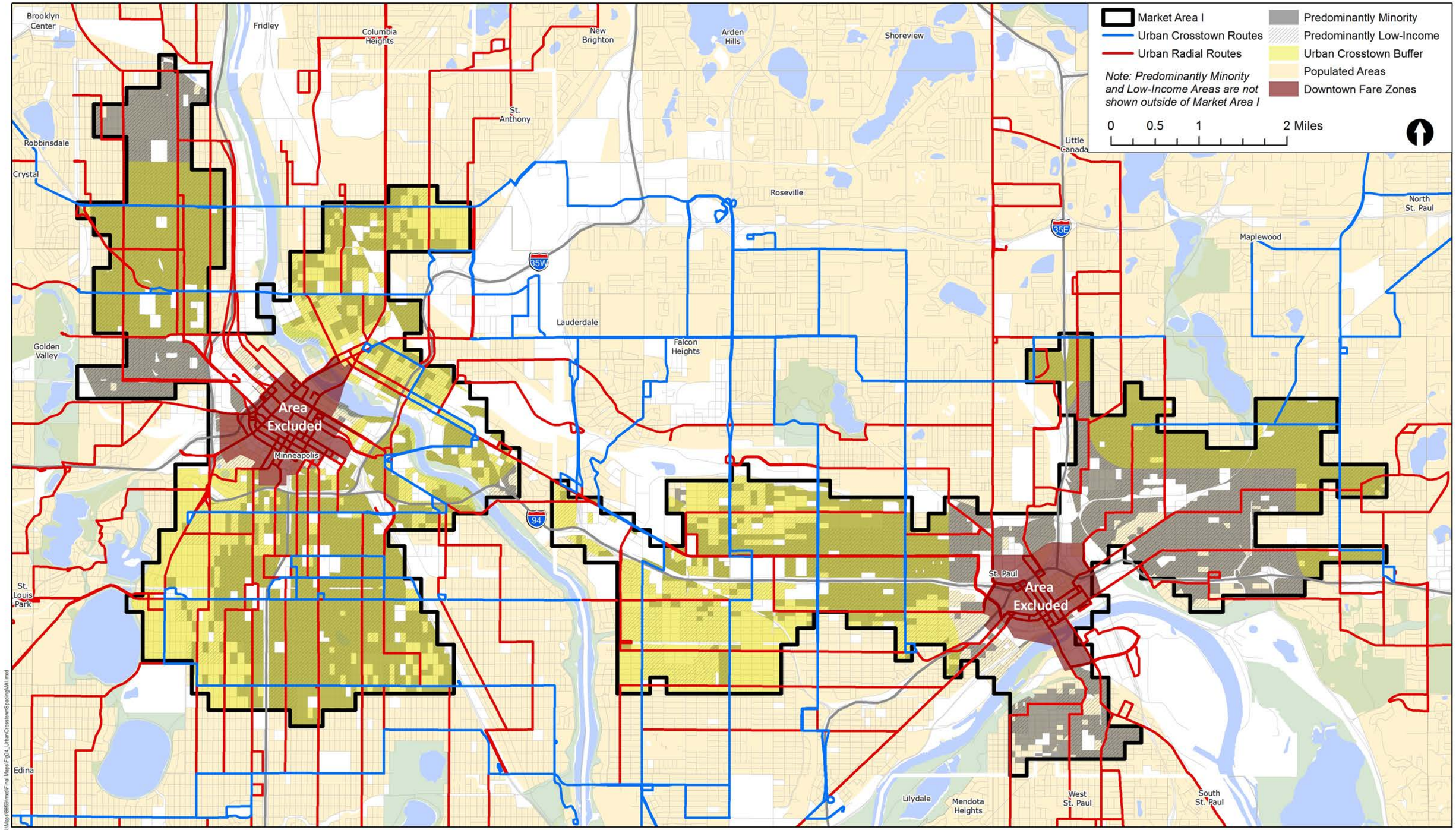
SRF Consulting Group, Inc.

Urban Radial Spacing (Market Area I)

Service and Facilities Standards Monitoring

Metro Transit

Figure 3



Urban Crosstown Spacing (Market Area I)
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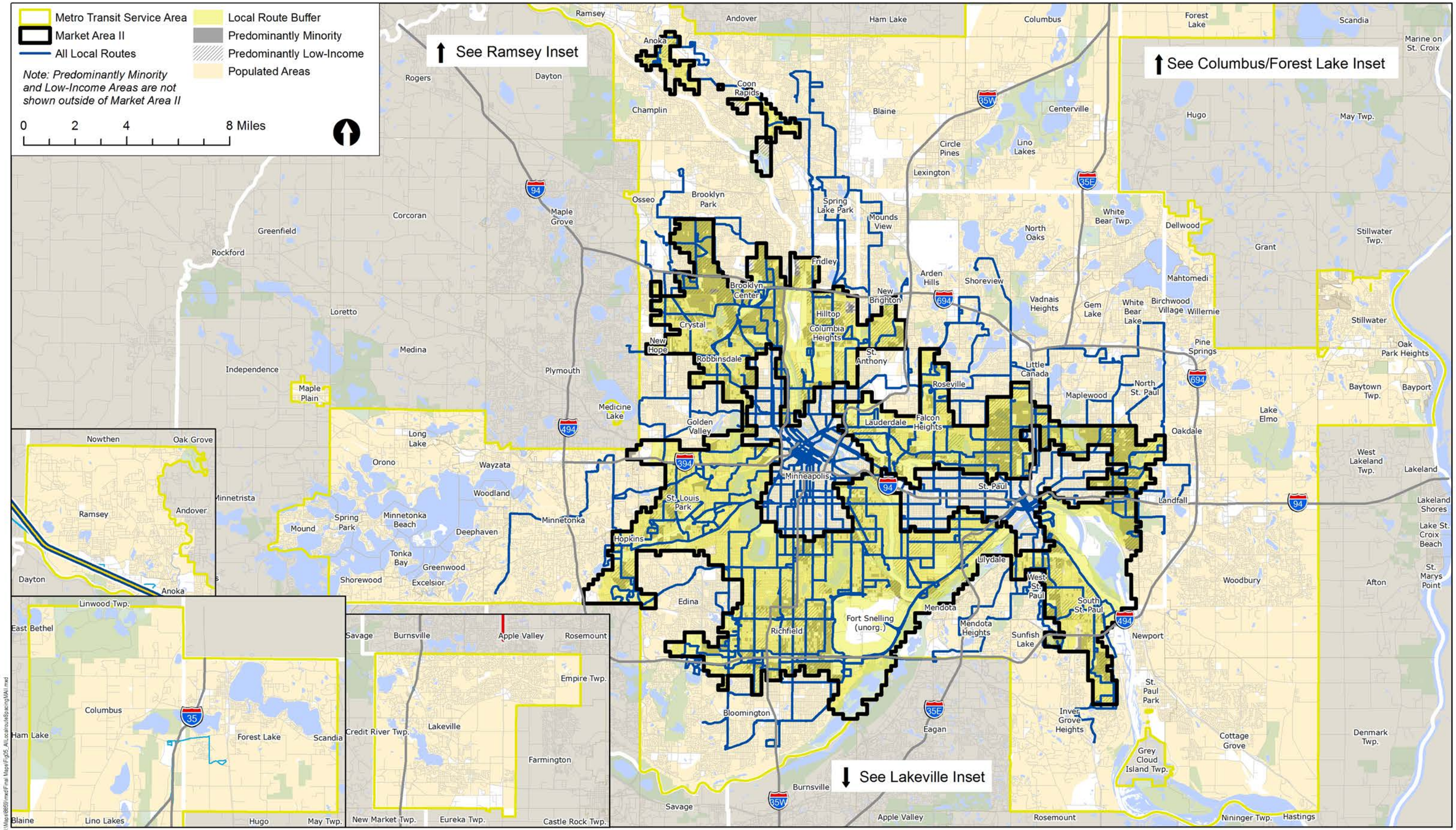
Figure 4



All Local Route Spacing (Market Area II)
Service and Facilities Standards Monitoring
Metro Transit

Figure 5

Analysis: Midday Service Availability

Service availability was evaluated based on the presence of transit service meeting the required headway during the midday off-peak period. The Market Area-specific headway standards identified in the TPP are as follows:

- **Market Area I:** Off-peak headway standards call for 30-minute headway or better.
- **Market Area II:** Off-peak headway standards call for 60-minute headway or better.
- **Market Area III:** Off-peak headway standards call for 60-minute headway or better on urban radial routes and 90-minute headway or better on suburban local routes. The 60-minute headway standard was used for this analysis.

Schedule information for the fall pick of 2014 was used as the baseline for this analysis. The hours between 11:00 a.m. and 2:00 p.m. on weekdays were assumed for midday service. Using this data, the average combined midday headway was calculated for each stop and station within Market Areas I, II, and III. A quarter-mile buffer was created around all bus stops meeting the combined headway standard. For BRT and LRT stations meeting the standard a half-mile buffer was used.

The service coverage area was overlaid against census blocks located both within Market Areas I, II, and III and within Metro Transit's service area in order to compare the proportion of predominantly minority areas meeting the midday service availability standard to the proportion of non-minority areas meeting the standard. This same process was used to compare the proportion of predominantly low-income areas meeting the standard to the proportion of non-low-income areas meeting the standard.

Results: Midday Service Availability

The results of this analysis are shown in Table 13. The location of predominantly minority and low-income areas as they relate to the midday service availability coverage area are shown in Figure 6.

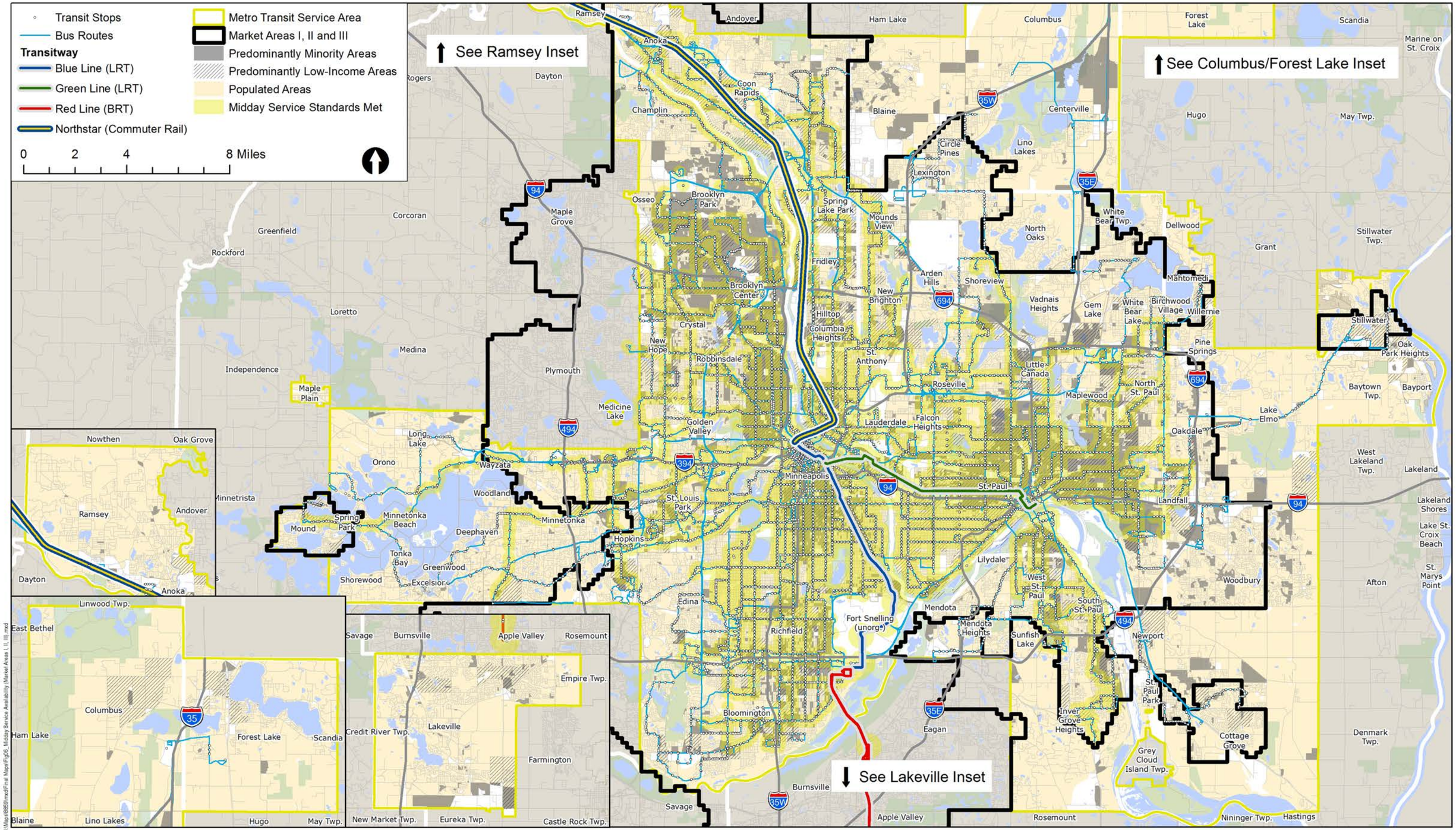
- 70.3 percent of the predominantly minority areas in Market Areas I, II, and III meet the midday service availability standard. This is significantly higher than the proportion of non-minority areas meeting the standard at 37.6 percent.
- 73.5 percent of the predominantly low-income areas in Market Areas I, II, and III meet the midday service availability standard. This is significantly higher than the proportion of non-low-income areas meeting the standard at 37.1 percent.

Table 13. Percent of Areas Meeting Midday Service Availability Standards

Area	Predominantly Minority Areas	Predominantly Non-Minority Areas	Predominantly Low-Income Areas	Predominantly Non-Low-Income Areas
Market Areas I, II, and III within Metro Transit's Service Area	70.3%	37.6%	72.5%	37.1%

Midday service availability is substantially higher for predominantly minority and low-income areas. This is particularly true for Market Areas I and II. Market Area III has much higher concentrations of non-minority and non-low-income populations and is not served as comprehensively. Market Area III's relative lack of coverage is reflected in the low total results for percent of non-minority and non-low-income areas meeting midday service availability standards.

Based on this analysis, no potential for disparate impact to minority populations or disproportionate burden to low-income populations is identified for the service availability (midday service availability) standard.



Midday Service Availability (Market Areas I, II, III)

Service and Facilities Standards Monitoring

Metro Transit

Figure 6

Analysis: Bus Stop and Station Spacing

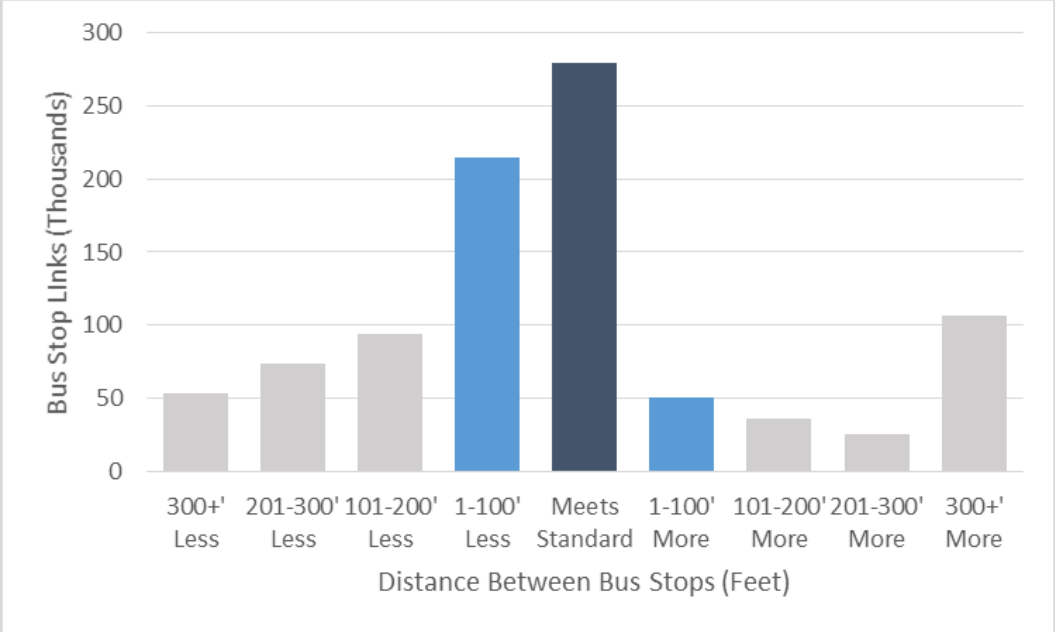
Metro Transit's bus stop spacing guidelines are provided in the 2030 TPP. The text notes that, "Bus stops that are close together reduce walking distance and access to transit, but tend to increase bus travel time. This recommended spacing seeks to achieve a balance." The recommended bus stop spacing is as follows:

- 6-8 stops per mile for local service
- 1-2 stops per mile for limited stop service

The standard of 6-8 stops per mile was used as the basis for this review for all local bus service, including local portions of limited stop and express routes. This represents a distance of 660 to 880 feet between bus stops. To account for cases where street networks or other geographic features do not allow for stop spacing precisely within the TPP-defined range, this review expanded the allowable range by considering stop spacing within 100 feet of the prescribed range acceptable (560 to 980 feet between stops). This approach also accounts for slight variations due to alternating near-side and far-side bus stop locations. To avoid the inclusion of non-stop portions of limited-stop or express routes, bus stop links greater than 0.5 miles were excluded from the analysis. A bus stop link is defined as the path along the roadway network between adjacent bus stops.

Figure 7 below displays the frequency of bus stop spacing for all bus stop links. The dark blue column represents the count of stop links meeting the bus stop spacing standard as outlined in the TPP. The light blue columns on either side represent stops links falling within 100 feet of the TPP standard. These light blue areas were assumed to meet the standard for the purpose of this analysis. In total, 58 percent of Metro Transit's bus stop link distances fall within 100 feet of the TPP standard.

Figure 7. Bus Stop Spacing Frequency



The Regional Transitway Guidelines provides recommended standards for bus rapid transit, light rail, and commuter rail station spacing. The recommended transitway station spacing is as follows:

- **Light Rail:** At least one-half mile apart (outside of central business districts (CBDs))
- **Bus Rapid Transit:** At least one-half mile apart (outside of CBDs)
- **Commuter Rail:** At least 5 miles apart (outside of CBDs) and at least 7 miles between CBD station and next station

For the evaluation of each mode, the percentage of stop links meeting the standards outlines above was compared between minority and low-income routes to the percentage of stop links meeting the standards on non-minority and non-low-income routes. Bus rapid transit stop links were incorporated into the final results for all bus service, but were evaluated based on their individual spacing standard.

Results: Bus Stop and Station Spacing

The results of the analysis are shown in Table 14. A total of 58 percent of the bus stop links comply with the spacing standard for this evaluation.

- 60.4 percent of the bus stops on minority routes are compliant with the bus stop spacing standard. This is higher than the compliance rate for non-minority routes at 53.9 percent.
- 59.4 percent of the bus stops on low-income routes are compliant with the bus stop spacing standard. This is higher than the compliance rate for non-low-income routes at 53.7 percent.

Table 14. Percent of Stop and Station Links Meeting Spacing Standards

Mode	Minority Routes	Non-Minority Routes	Low-Income Routes	Non-Low-Income Routes
Bus	60.4%	53.9%	59.4%	53.7%
Light Rail	92.3%	n/a	92.3%	n/a
Northstar Commuter Rail	n/a	66.7%	n/a	66.7%

All of the stations on the Green Line light rail corridor comply with the minimum station spacing standard. Two of the station links on the Blue Line light rail corridor are below the minimum spacing standard. These links are between the 28th Avenue and Bloomington Central stations and between the Bloomington Central and American Boulevard/34th Avenue stations.

Only two-thirds of the station links on the Northstar commuter rail comply with the minimum station spacing standard. The placement of the Anoka station causes this issue as it is located only 1.9 miles from the Coon Rapids Riverdale station and 4.1 miles from the Ramsey station.

Based on this analysis, no potential for disparate impact to minority populations or disproportionate burden to low-income populations is identified for the service availability (bus stop spacing) standard.

Transit Amenities

The Title VI Circular states the following in regard to distribution of transit amenity standards:

> Transit amenities refer to items of comfort, convenience, and safety that are available to the general riding public. Fixed route transit providers must set a policy to ensure equitable distribution of transit amenities across the system.

Metro Transit's transit amenity evaluation includes a review of bus shelters, customer information, and the distribution of amenities in facilities such as park-and-rides, transit centers, and transitway stations. This evaluation reviews the status of regional transit amenities that were in place as of December 31, 2014. In late 2014, Metro Transit reinforced its commitment to providing equitable distribution of transit amenities by launching the Better Bus Stops program, partially funded by a federal Ladders of Opportunities grant. This program will invest in bus stop improvements focused in areas of concentrated poverty where more than half the residents identify as people of color. Better Bus Stops is investing in community engagement that reaches people and communities who are traditionally under-represented in the transit decision-making process. Through the program, communities will:

- Have greater access to information about Metro Transit's planned and existing transit amenities
- Provide input that guides transit amenity investments at specific bus stops
- Provide input that influences potential changes to Metro Transit's guidelines that determine where transit amenities are placed and influence future bus stop investments

Analysis: Bus Shelter Distribution

Metro Transit's bus shelter placement guidelines are provided in the 2030 TPP. Shelter placement is warranted when the average daily ridership at a bus stop meets or exceeds specific ridership thresholds. For bus stops within Minneapolis and Saint Paul, shelters may be warranted at stops with 40 or more boardings per day. For all other bus stops, shelters may be warranted at stops with 20 or more boardings per day. In addition, the ridership threshold for considering the installation of shelter heaters is 80 or more boardings per day

in all areas. No warrants or guidance currently exist regarding the placement of lighting at shelters.

A known exception to the regional standard occurs in Roseville, where the city installs shelters as desired regardless of passenger volumes. In addition, private entities such as CBS Outdoor and private property owners are allowed to install shelters without Metro Transit consent. Metro Transit does not install its own shelters at warranted privately-owned shelters, nor does the agency remove unwarranted privately-owned shelters. In 2014, the City of Minneapolis ended its contract with CBS Outdoor and shifted the maintenance of these shelters to Metro Transit. Metro Transit is currently in the process of reviewing boarding levels at these shelters to assess their compliance with the shelter warrants. Per Metro Transit policy, if the daily boardings at an existing shelter fall below 50 percent of the warrant thresholds, the shelter will be removed.

The designation of each bus stop as minority or low-income was determined based on the number of trips serving each stop from minority and low-income routes. If more than half of the trips serving a bus stop were from minority bus routes, the stop was considered a minority bus stop. Likewise, if more than half of the trips serving a bus stop were from low-income bus routes, the stop was considered a low-income bus stop.

Information on the number of average daily boardings at each bus stop was reviewed to identify stops meeting the ridership thresholds for shelter and heaters. This was then compared to current database of existing bus shelter locations, including those with heaters and lighting. The rates of shelter distribution were evaluated using two approaches:

- The first approach compared the distribution rates of warranted shelters (those with ridership above the appropriate thresholds) at minority and low-income bus stops to the distribution rates at non-minority and non-low-income bus stops.
- The second approach repeated these comparisons for the distribution of unwarranted shelters (those with ridership below the appropriate thresholds).

A similar approach was used to compare the distribution rates of warranted and unwarranted shelter heaters. Since Metro Transit has no standard for the placement of lighting at shelters, this was evaluated by comparing the overall distribution of lighting at minority, non-minority, low-income, and non-low-income bus stops. In this analysis lighting means a light in the shelter itself and does not take streetlights or other ambient lighting into consideration.

Results: Bus Shelter Distribution

The results of these analyses are shown in Table 15. The locations of warranted and unwarranted shelters, warranted and unwarranted heaters, and lighting is shown in Figure 8. Out of the 12,296 bus stops identified in this evaluation, 1,219 (9.9 percent) meet the ridership warrant for a shelter and 360 (2.9 percent) meet the ridership warrant for a heater.

Warranted Shelters

- The placement rate of shelters at minority stops meeting the warrant is 49.8 percent. This is higher than the placement rate of shelters at non-minority stops meeting the shelter warrant at 44.4 percent.
- The placement rate of shelters at low-income stops meeting the warrant is 49.6 percent. This is higher than the placement rate of shelters at non-low-income stops meeting the shelter warrant at 41.1 percent.

Unwarranted Shelters

The process of removing shelters is not without cost. In some cases, shelters have been installed at bus stops that once met the ridership warrants for shelter installation, but no longer do. As noted above, Metro Transit's policy is to remove shelters if the daily boardings fall below 50 percent of the warrant threshold.

- The placement rate of shelters at minority stops not meeting the warrant is 4.1 percent. This is higher than the placement rate of shelters at non-minority stops not meeting the warrant at 1.7 percent.
- The placement rate of shelters at low-income stops not meeting the warrant is 4.1 percent. This is higher than the placement rate of shelters at non-low-income stops not meeting the warrant at 1.2 percent.

Warranted Heaters

- The placement rate of heaters at minority stops meeting the warrant is 5.8 percent. This is higher than the placement rate of heaters at non-minority stops meeting the warrant at 3.4 percent.
- The placement rate of heaters at low-income stops meeting the warrant is 5.5 percent. This is higher than the placement rate of heaters at non-low-income stops meeting the warrant at 3.9 percent.

Unwarranted Heaters

- The placement rate of heaters at minority stops not meeting the warrant is 0.08 percent. This is higher than the placement rate of shelters at non-minority stops not meeting the warrant at 0.06 percent.
- The placement rate of heaters at low-income stops not meeting the warrant is 0.11 percent. None of the non-low-income stops not meeting the warrant are equipped with heaters.

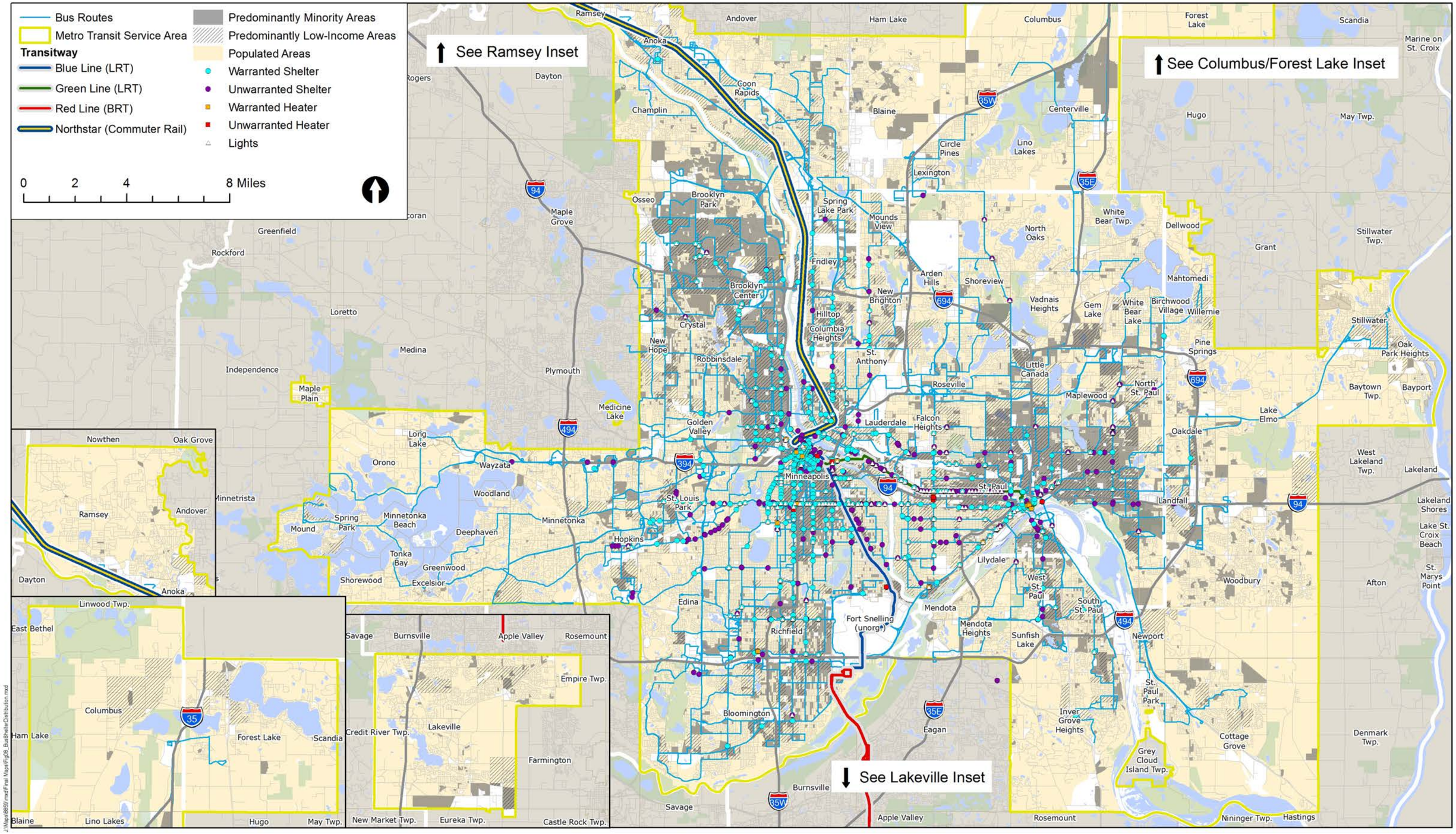
Lighting

- The overall placement rate of lighting at minority stops is 28.9 percent. This is higher than the placement rate of lighting at non-minority stops at 17.7 percent.
- The overall placement rate of lighting at low-income stops is 28.3 percent. This is higher than the placement rate of lighting at non-low-income stops at 12.5 percent.

Table 15. Bus Shelter Amenity Placement Rates

Bus Stop Amenity	Minority Stops	Non-Minority Stops	Low-Income Stops	Non-Low-Income Stops
Shelters (At Warranted Stops)	49.8%	44.4%	49.6%	41.1%
Shelters (At Unwarranted Stops)	4.1%	1.7%	4.1%	1.2%
Heaters (At Warranted Stops)	5.8%	3.4%	5.5%	3.9%
Heaters (At Unwarranted Stops)	0.08%	0.06%	0.11%	0.00%
Lights (At Stops with Shelters)	28.9%	17.7%	28.3%	12.5%

Based on this analysis, no potential for disparate impact to minority populations or disproportionate burden to low-income populations is identified for the transit amenities (bus shelter distribution) standard.



Bus Shelter Distribution

Service and Facilities Standards Monitoring

Metro Transit

Figure 8

Analysis: Customer Information

Metro Transit provides service information to its customers through a variety of means:

- Printed signs, system maps, and route maps are provided throughout the system. Schedule information is provided in all shelters, including privately owned shelters.
- Information is also made available through real-time information signs. However, because of their limited deployment throughout the transit network, electronic real-time signs were excluded from this analysis. Currently these signs are only located at LRT stations, in downtown Minneapolis along the Marquette and 2nd Avenue Express Bus Lanes and at a limited number of park-and-ride facilities and transit centers. Metro Transit is currently developing guidelines for future deployment of real-time signs. Real-time signs will be included in future analyses.
- The Transit Information Center (TIC) fields over 1 million calls per year from transit customers.
- An automated interactive voice response (IVR) system is also available to provide scheduled and real-time transit information.
- Go-To Card customers can also receive information on the account's stored value amount and add funds to their card through the phone system.
- An online trip planner which is interfaced with real-time scheduling information allows customers to plan their trips using personal computers or online mobile devices. The system currently receives over 6.4 million trip queries per year.

The current TPP does not provide policy direction for the distribution of customer information. However, Metro Transit is currently developing guidelines for when different types of customer information (e.g., route maps, route schedules, system maps, real-time signs, etc.) should be provided. Part of this process will be identifying where system maps should be added or removed.

In 2015, Metro Transit also developed new guidelines for its standard bus stop signs. The new standard signs include the addition of a unique stop number, instructions for accessing real-time departures for that stop, and the route numbers that serve that stop. In addition, stops without timetables posted but with 10 or more average daily boardings will have additional signs about the routes that serve the stop, including route maps, a description of where the route goes, and frequency information when appropriate. The new bus stop signs will be installed at all 12,000+ system-wide bus stops; this project is expected to be substantially complete in 2017. The new bus stop signs will be more useful to customers than system maps because they will provide more details about routes at that stop.

For this evaluation, the distribution of customer information was analyzed by comparing the distribution of three key customer information tool/materials:

System Maps

System maps provide an overview of transit service throughout the region. Metro Transit maintains 23 locations where up-to-date system maps are displayed for the public. In addition, there are nine locations where pocket sized folding system maps are distributed.

The distribution of system map displays and distribution outlets was evaluated by comparing the access to these amenities at minority and low-income stops compared to non-minority and non-low-income stops. The results were then weighted by calculating the number of trips serving each stop. The final unit of measure for this analysis is the trip-stop, a unique instance of each trip at each stop. The approach more accurately reflects the availability of the amenity (i.e., a system map displayed at a transit center serving multiple high-frequency routes in the urban core will be seen by more customers than one displayed at a suburban park-and-ride with only peak service). To account for areas where a single system map display provides service to multiple stop locations, all stops located within 300 feet of a system map display or distribution location were identified as having access to these amenities.

Timetable Displays

Timetables display the scheduled arrival times for routes providing service at a particular location. Timetables are typically incorporated into all bus stop shelters, transit centers, and park-and-rides, but may also exist as standalone displays mounted to the bus stop sign pole. These displays provide necessary transit service information to riders and improve the ease of use of the system. Timetable displays are available at a total of 988 locations throughout the system.

The distribution of timetable displays was evaluated by comparing the distribution of these amenities at minority and low-income stops compared to the distribution at non-minority and non-low-income stops. As with the system map evaluation, the results were then weighted by the number of trips serving each stop to more accurately reflect the availability of the timetables to riders. To account for minor geographical differences between the data sources of bus stops and timetable displays, stops located within 100 feet of a timetable display location were identified as having access to that amenity.

Pocket Schedule Distribution Outlets

Metro Transit prepares pocket schedules that include information on the route alignment, scheduled arrivals at key timepoints, and fare structure for each route, as well as customer service contact information for additional assistance. These outlets are commonly located in public facilities such as libraries, shopping centers, and schools. A total of 376 outlet locations are available throughout the system.

The distribution of pocket schedule distribution outlets was evaluated by comparing the distribution of these amenities at minority and low-income stops compared to the distribution at non-minority and non-low-income stops. As with the previous analyses, the results were then weighted by the number of trips serving each stop to more accurately reflect the availability of the distribution outlets to riders.

Many of these outlets are located in areas that could potentially be accessed via the transit system. Since these outlet locations do not need to be immediately adjacent to a bus stop to fulfill their purpose, a broader buffer area was used for this analysis. All bus stops located within one-quarter mile of a pocket schedule distribution outlet were identified as having access to this amenity. Of the 376 distribution outlets, 29 are located outside of this quarter-mile distance, primarily in suburban locations

Results: Customer Information

The results of the evaluation of customer information distribution are summarized in Table 16. The locations of system maps, timetable displays, and pocket schedule distribution outlets are shown in Figure 9.

System Maps

The results for low-income trip-stops indicate the potential for disproportionate burdens to low-income populations. This result is most likely due to the large number of system map displays located at park-and-ride facilities in suburban areas primarily served by non-low-income routes. Further evaluation of this finding and potential mitigation measures are discussed further in the Additional Analysis section.

- 2.3 percent of all minority trip-stops have access to system map displays or map distribution locations. This is slightly lower than the rate of non-minority trip-stops with access at 2.5 percent, but is within the four-fifths rule.
    - 2.3% / 2.5% = 92.0% > 80% (four-fifths)
- 2.2 percent of all low-income trip-stops have access to system map displays or map distribution locations. This is lower than the rate of non-low-income trip-stops with access at 3.1 percent and is not within the four-fifths rule.
    - **2.2% / 3.1% = 71% < 80% (four-fifths)**

Timetable Displays

The results of the evaluation of timetable displays do not indicate any potential for disparate impact to minority populations or disproportionate burdens to low-income populations.

- 29.6 percent of all minority trip-stops have access to timetable displays. This is higher than the rate of non-minority trip-stops with access at 23.9 percent.

- 29.5 percent of all low-income trip-stops have access to timetable displays. This is higher than the rate of non-low-income trip-stops with access at 21.2 percent.

Pocket Schedule Distribution Outlets

The results of the evaluation of pocket schedule distribution outlets do not indicate any potential for disparate impact to minority populations or disproportionate burdens to low-income populations.

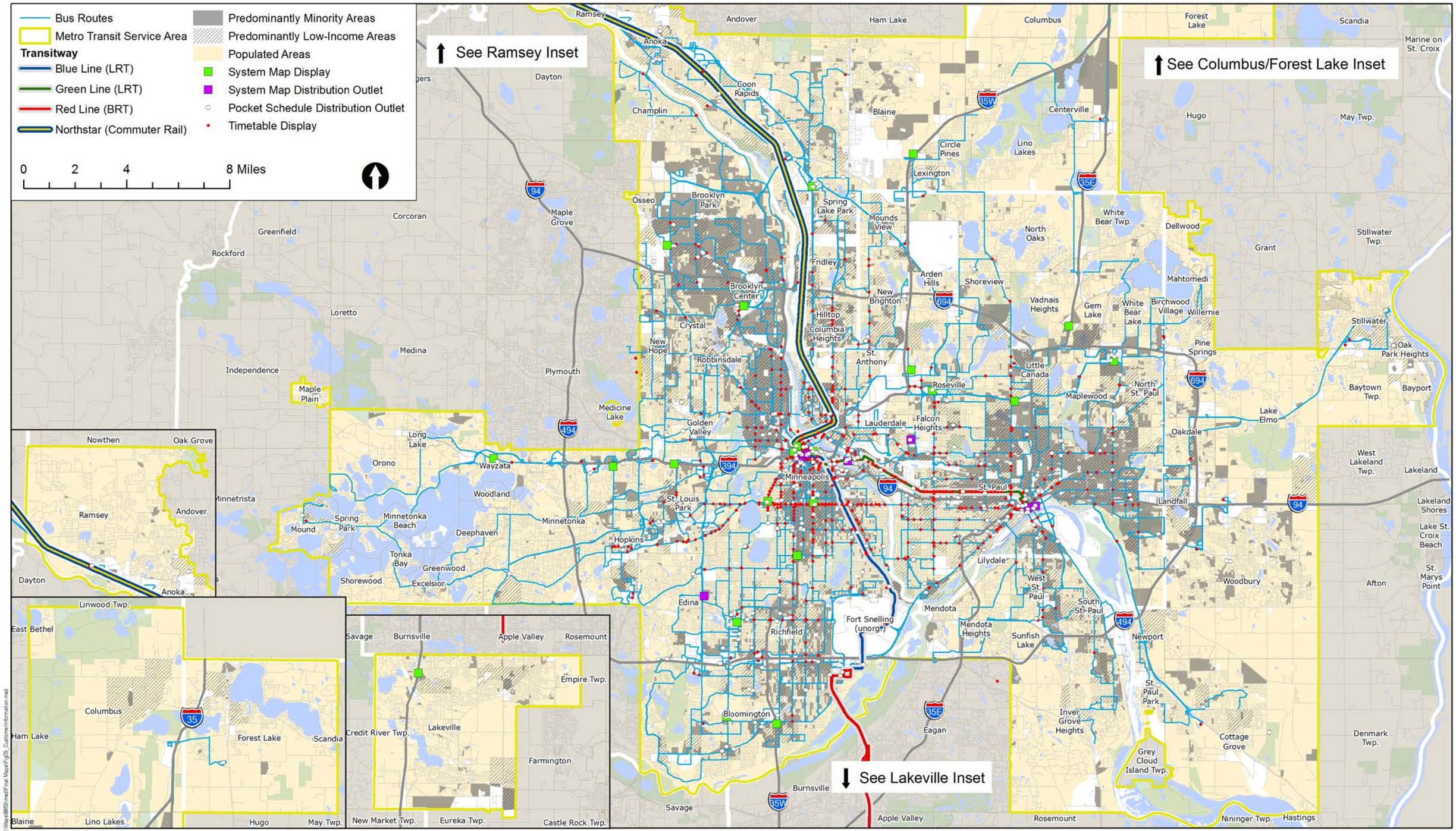
- 38.2 percent of all minority trip-stops have access to pocket schedule distribution outlets. This is higher than the rate of non-minority trip-stops with access at 33.4 percent.
- 37.5 percent of all low-income trip-stops have access to pocket schedule distribution outlets. This is higher than the rate of non-low-income trip-stops with access at 33.5 percent.

Table 16. Percent of Trip-Stops with Customer Information Available

Customer Information Amenity	Minority Route Trip- Stops	Non-Minority Route Trip-Stops	Low-Income Route Trip-Stops	Non-Low-Income Route Trip-Stops
System Maps	2.3%	2.5%	2.2%	3.1%
Time Tables	29.6%	23.9%	29.5%	21.2%
Pocket Schedule Distribution Locations	38.2%	33.4%	37.5%	33.5%

Based on this analysis, no potential for disparate impact to minority populations or disproportionate burden to low-income populations is identified for timetable displays and pocket schedule distribution outlets under the transit amenities (bus shelter distribution) standard.

This analysis did find the potential for disproportionate burdens to low-income populations for system map distribution under this standard. This finding will be discussed in more detail in the Additional Analysis section.



Customer Information

Service and Facilities Standards Monitoring

Metro Transit

Figure 9

Analysis: Transit Facilities

Metro Transit's standards for transit facility amenities are summarized in the 2030 TPP. Potential amenities include lights, heaters, trash receptacles, stand-alone benches, cameras, and electronic customer information displays. These amenities are designated as "always provided", "occasionally provided", or "never provided" for each facility type. Standards are also included for bus shelter amenities, but this category is reviewed under the Bus Shelter Distribution analysis in previous sections. The TPP standards are summarized in Table 17.

The TPP also notes that these guidelines apply "only to public transit agency-owned facilities. Providers also lease park & ride lots, and some shelters are owned and maintained by other entities. In those cases, providers do not normally offer customer amenities, although some may be included in certain situations."

Table 17. TPP Standards for Transit Facility Amenities

Facility Type	Lights	Heaters	Trash Recep-tacles	Stand-Alone Benches	Cameras	Electronic Customer Information Displays
Transit Centers	Y	Y	Y	Y	O	O
Park-and-rides	Y	O	O	O	O	O
Rail Stations	Y	Y	Y	Y	Y	Y

Y = Always Provided; O = Occasionally Provided; N = Not Provided

In accordance with the TPP, the analysis included only facilities under Metro Transit ownership. In cases where Metro Transit does not own the parcel, but has a significant construction or maintenance investment in the property, the facility was also treated under Metro Transit ownership. Most of these cases are permanent facilities on MnDOT right-of-way, but constructed and operated by Metro Transit. In many cases throughout the region, Metro Transit leases properties for transit use from private entities. In these cases, Metro Transit is not responsible for the facilities provided at these locations. Three exceptions to the evaluation of the TPP standards were used in this analysis:

- Security camera distribution is limited to major facilities with high usage and was not included in this review for transit centers and park-and-rides.
- The deployment of electronic customer information displays throughout the transit network is limited and was also not included in this review. These displays are currently only located at LRT stations, in downtown Minneapolis along the Marquette and 2nd Avenue Express Bus Lanes and at a limited number of park-and-ride facilities and transit centers. Metro Transit is currently developing guidelines for future deployment of real-time signs. Real-time signs will be included in future analyses.

- The TPP guidance refers to a requirement of standalone benches at many transit facilities. This analysis also reviews the inclusion of other types of benches, such as those integrated into transit shelters. Generally Metro Transit does not provide standalone benches at bus stops. Most bus benches are provided by a private company (US Bench) and are sited primarily for advertising purposes. For this analysis, any the presence of any bench at a facility was assumed to meet the Stand-Alone Bench requirement.

A qualitative approach was used to evaluate the distribution of transit facility amenities by comparing the locations of facilities meeting and not meeting the standards against areas of predominantly minority and predominantly low-income areas. Designating transit facilities as predominantly minority or low-income is difficult since most facilities provide service to populations from multiple routes from a broad geographical range.

Results: Transit Facilities

The results of the evaluations for transit centers, park-and-rides, and transit stations are summarized in the sections below. The locations of these facilities in relation to Metro Transit's service area are shown in Figure 10.

Transit Centers

A total of 18 transit centers were reviewed for amenity distribution. Of these, 17 meet all four mandatory amenities required at these facilities (lights, heater, trash, and bench). The one facility that does not provide all of the required amenities is shown in Table 18. A full listing of Transit Center amenities is provided in Appendix C.

Table 18. Transit Centers Lacking Required Amenities

Transit Center	Lights	Heaters	Trash Receptacles	Bench
Little Canada Transit Center	Yes	No	Yes	Yes

In reviewing this facility, it is important to note that the Little Canada Transit Center has extremely low ridership levels compared to other transit centers. The provision of heaters is not warranted by the current ridership levels.

Based on this information and a qualitative examination of the locations of these facilities in Figure 10, no potential for disparate impact to minority populations or disproportionate burden to low-income populations is identified for the distribution of transit center amenities under the transit amenities (transit facilities) standard.

Park-and-Rides

A total of 28 standalone park-and-rides (not co-located with a transit center or transitway station) were reviewed for amenity distribution. Lighting is the only amenity listed in the standard as being "always required". The presence or heaters, trash receptacles and benches were reviewed for this analysis. The presence of any type of bench was assumed to satisfy the occasionally provided stand-alone bench standard.

All of the facilities reviewed meet the mandatory lighting standard for park-and-ride facilities. Of the 28 facilities, 16 include all of the occasionally provided amenities. The remaining 12 are summarized below in Table 19. A full listing of park-and-ride amenities is provided in Appendix D.

Table 19. Park-and-Rides Lacking Occasionally Provided Amenities

Park-and-Ride	Heater	Trash	Bench
Como & Eustis	No	No	Yes
Hwy 61 & Lower Afton Rd	No	Yes	Yes
Park Place & I-394	No	Yes	Yes
Woodbury Theatre	Yes	Yes	No
I-35W & Co Rd H	No	Yes	Yes
Hwy 61 & Co Rd C	No	No	Yes
West River Rd & 117th Ave	No	No	Yes
Knox Avenue at Best Buy	Yes	No	No
Hwy 7 & Vinehill Rd	No	No	No
Paul Pkwy	No	Yes	Yes
I-35E & Co Rd 14	No	Yes	Yes
I-35E & Co Rd E	No	Yes	Yes

Based on this information and a qualitative examination of the locations of these facilities in Figure 10, no potential for disparate impact to minority populations or disproportionate burden to low-income populations is identified for the distribution of park-and-ride amenities under the transit amenities (transit facilities) standard.

Transitway Stations

Transitway stations include the rail station facilities for the Northstar Commuter Rail and for the Green and Blue Line light rail systems. Bus transitway facilities include the Red Line bus rapid transit system and the I-35W/46th Street Station facility. For the purposes of this analysis, the TPP standards for rail stations will be applied to all transitway stations.

All transitway stations in the Metro Transit service area comply with the six standards for amenities always provided at these types of facilities (lights, heater, trash, standalone bench, camera, and electronic customer information display). All transitway stations are also equipped with a shelter and/or a facility that provides shelter.

Based on this information, no potential for disparate impact to minority populations or disproportionate burden to low-income populations is identified for the distribution of transitway station amenities under the transit amenities (transit facilities) standard.

Bus Routes
Metro Transit Service Area
Predominantly Minority Areas
Predominantly Low-Income Areas
Populated Areas

Transitway
Blue Line (LRT)
Green Line (LRT)
Red Line (BRT)
Northstar (Commuter Rail)

0 2 4 8 Miles

Transitway Stations

Transit Centers
All Required Amenities
Missing One or More Required Amenities

Park and Rides
All Required Amenities
Missing One or More Occasionally Required Amenities

See Ramsey Inset
See Columbus/Forest Lake Inset
See Lakeville Inset

Ramsey, Anoka, Andover, Ham Lake, Columbus, Forest Lake, Scandia, Marine on St. Croix, Rogers, Dayton, Champlin, Coon Rapids, Blaine, Centerville, Hugo, May Twp., Circle Pines, Lino Lakes, Lexington, Osseo, Brooklyn Park, Spring Lake Park, Mounds View, Maple Grove, North Oaks, White Bear Twp., Dellwood, Grant, Stillwater Twp., Fridley, Arden Hills, Shoreview, Mahtomedi, Brooklyn Center, New Brighton, Vadnais Heights, Gem Lake, White Bear Lake, Birchwood Village, Willernie, Stillwater, Loretto, Crystal, Hilltop, Columbia Heights, New Hope, Robbinsdale, St. Anthony, Pine Springs, Oak Park Heights, Medina, Independence, Plymouth, Maple Plain, Little Canada, Roseville, Maplewood, North St. Paul, Baytown Twp., Bayport, Medicine Lake, Golden Valley, Lauderdale, Falcon Heights, Lake Elmo, Oakdale, Long Lake, Orono, Wayzata, Woodland, St. Louis Park, Minneapolis, St. Paul, West Lakeland Twp., Lakeland, Lakeland Shores, Minnetonka Beach, Minnetonka, Deephaven, Mound, Spring Park, Hopkins, Tonka Bay, Greenwood, Excelsior, Shorewood, Lilydale, Landfall, Lake St. Croix Beach, Woodbury, Afton, St. Marys Point, Edina, Mendota, Fort Snelling (unorg.), Richfield, West St. Paul, South St. Paul, Mendota Heights, Sunfish Lake, Newport, Bloomington, Eagan, Inver Grove Heights, St. Paul Park, Cottage Grove, Grey Cloud Island Twp., Denmark Twp., Burnsville, Savage, Apple Valley, Rosemount, Nininger Twp., Hastings

Nowthen, Oak Grove, Ramsey, Andover, Dayton, Anoka

Linwood Twp., East Bethel, Columbus, Ham Lake, Forest Lake, Scandia, Blaine, Lino Lakes, Hugo, May Twp.

Savage, Burnsville, Apple Valley, Empire Twp., Credit River Twp., Lakeville, Farmington, New Market Twp., Eureka Twp., Castle Rock Twp.

J:\Maps\9859\mxd\Final Maps\Fig10_TransitFacilityAmenities.mxd

SRF Consulting Group, Inc.

Transit Facility Amenities
Service and Facilities Standards Monitoring
Metro Transit

Figure 10

Vehicle Assignment

The Title VI Circular states the following in regard to vehicle assignment standards:

> Vehicle assignment refers to the process by which vehicles are placed into service in depots and on routes throughout the transit provider's system. Policies for vehicle assignment may be based on the age of the vehicle, where age would be a proxy for condition.

Vehicle assignment and other standards are summarized in the Metropolitan Council's *Fleet Management Procedures*, updated in 2012. These procedures are designed to facilitate compliance with FTA and Title VI standards, assure that vehicles purchased meet minimum standards, and create efficiencies and improve flexibility in the deployment/reassignment of vehicles to the extent feasible.

Metro Transit/Metropolitan Council Fleet

Metro Transit has five bus garages, along with a two light rail and one commuter rail depots. Many routes are operated out of multiple garages and not necessarily designed to serve a specific area. In addition, the Metropolitan Council Metropolitan Transportation Services (MTS) contracts out 29 routes. As of fall 2014, there were two contractors using four separate garage locations. In all cases, the Metropolitan Council owns the buses and leases them to the operating contractor under a master vehicle lease.

A total of 941[1] Metro Transit buses and 96 MTS buses were used to provide fixed route services in the fall of 2014. A summary of this fleet is provided in Table 20.

Table 20. Metro Transit/Metropolitan Council Fleet Summary

Bus Type	Bus Count	Model Years
40' High-Floor	434	2003, 2004, 2006, 2008, 2010, 2011, 2012, 2013, 2014
40' Low-Floor	169	2001, 2002, 2003, 2004, 2013
40' Low-Floor Hybrid	131	2003, 2007, 2008, 2010, 2012
Articulated Low-Floor	103	2007, 2008, 2009, 2010, 2011, 2013
Articulated High-Floor	62	2003, 2004, 2006
30' High-/Low-Floor	66	2003, 2004, 2007, 2009, 2011, 2013, 2014
Commuter Coach	44	2000, 2009, 2012, 2013, 2014
Small Bus	28	2008, 2012, 2013

All 30-foot, 40-foot, and articulated buses have a 12-year life span. Commuter coach buses are replaced every 14 years; small cutaway buses have a life span of 5-7 years.

[1] The size of the Metro Transit active fleet at any given time during this period was 894 buses. However, because of bus retirements and replacements, the total number of buses that provided service during this period was 941.

Guidelines for Assigning Vehicle to Garages

Metro Transit's Bus Maintenance department has developed guidelines for assigning vehicles to garages. When service needs require adjustment of the fleet between one service garage and another, or when new vehicles are added to the fleet, the following items need to be considered:

1. Garage capacity and characteristics
2. Spare factor
3. Vehicle Type: 40-foot or Articulated, based on ridership as assigned by Service Development
4. Average fleet age: a fair and balanced average fleet age will be maintained throughout all garages. This ensures knowledge of new technology will be broadly distributed to all mechanics, and helps keep both Operators and Mechanics system-wide sharing the benefits of new equipment.
5. Sub-fleets: a particular vehicle design or configuration should be kept together whenever possible
6. Automatic Passenger Counters (APCs): The percentage of buses equipped in each sub-fleet should be the same across all garages.
7. Stability: a bus is kept at the same garage its entire service life if possible to provide ownership and accountability to the garage.
8. Sequential numbers: sequentially numbered groups of buses are kept together whenever possible to ease administrative tracking

Contractor Fleet Management

MTS assigns vehicles to a specific contractor garage as part of the contract; those buses normally do not transfer to another contractor during the life of the contract. If a new contractor is awarded a service contract, the buses follow the service. Buses are moved from one contract to another only occasionally as routes are added or terminated, vehicle issues arise, etc.

The contractor may assign any bus to any route as long as it is the correct size and type of bus. As a matter of practice, contractors prefer to assign the same vehicle to the same operator on a regular basis to track vehicle maintenance and condition concerns. However, because not all buses are equipped with APCs, MTS stipulates within the operating contract that vehicles must be rotated among operators and work pieces to ensure APC coverage throughout the service.

Specific Vehicle Assignment Policies

In select situations, a specific bus type or size is assigned to a route or geographic area.

Commuter Coach Buses

Coach buses may be used on express trips carrying riders on a one-way trip length of 15 miles or longer and duration of more than 30 minutes. Although coach buses are lift-equipped, an effort is made to not use them on trips with regular wheelchair users due to the narrow aisle configuration and length of time it takes to deploy the lift. The Service Analysis group assigns coach buses to specific blocks based on ridership patterns and trip distance. Currently coach buses are used on some trips on Routes 270, 275, 285, 288, 294, 355, 365, 375, 467, 860, and 865.

Hybrid Buses

Through agreement with the City of Minneapolis, all routes operating on Nicollet Mall in downtown Minneapolis must use hybrid buses. This includes Routes 10, 11, 17, 18, 25, 59, and 568. Hybrid buses are also assigned to Routes 63, 64, and 68 operating in St. Paul.

Automatic Passenger Counter (APC)-Equipped Buses

In past years, Metro Transit's APC-equipped buses have been rotated throughout the system periodically in order to get a complete sample of all trips. Now that 85 percent of all vehicles are equipped with APCs and 100 percent are equipped with video cameras, this rotation is not required to collect adequate trip samples.

Articulated Buses

Metro Transit has both low-floor and high-floor articulated buses in its fleet. These buses can be used on either local or express routes. Service Analysis assigns articulated buses to specific blocks based on ridership patterns and maximum loads. Assignments are reviewed at least once each quarter. Articulated buses are used primarily on express routes during the peak period. If articulated buses are used on a local route, an effort is made to use low-floor buses to speed boarding times.

Small Buses

Buses that are 30 feet or smaller are sometimes used by contractors to provide service on lower-ridership suburban local routes.

Analysis

This monitoring is intended to evaluate the quality of service (in this case, vehicle quality) provided to customers. This evaluation used bus age as a general indicator of the quality of the riding experience. To generate a report of the average age of buses by route, it was first necessary to determine what vehicle type was assigned to each weekday trip during the fall of 2014. This information was generated primarily using automatic vehicle locator (AVL) data. If AVL data was not available for a trip, secondary sources were used, including farebox data and dispatcher-recorded assignments. Using a combination of these sources, vehicle age was established for 99.45 percent of all trips. In cases where more than one vehicle was used to operate a trip[2], the age of the first vehicle assigned was used.

Two approaches were used to evaluate the vehicle assignment data:

- The first approach compared the average age of vehicles assigned to minority or low-income route trips to the average age of vehicles assigned to non-minority or non-low-income route trips.
- The second approach compared the average age of vehicles assigned to each route trip to the average age of vehicles available at each route's respective garage. For this approach, "vehicles available" were defined as being the appropriate size and type for each route.

An analysis of LRT and Commuter Rail vehicles was not included due to the limited availability of data on the age of assigned vehicles. Metro Transit's Blue Line fleet consists primarily of light rail vehicles (LRVs) purchased in 2004 and 2007. Metro Transit's Green Line fleet consists primarily of LRVs purchased in 2012. However, in some cases, year 2012 vehicles are assigned to Blue Line service when they are not need on the Green Line. Metro Transit's commuter rail fleet consists of vehicles purchased in 2009.

Results

The average age of vehicles assigned to Metro Transit and Metropolitan Council routes was 4.2 years. It should be noted that this value is less than average age of vehicles in the fleet, which is 6.0 years. Newer buses tend to be more reliable and as a result are more frequently available to be assigned to trips. During the evaluation period, Metro Transit was also in the process of retiring old buses. The average fleet age was calculated based on the ages of all buses in service at any time during a three month period. In actuality, the average age of the fleet dropped steadily over this period. A route-by-route summary of vehicle assignment results is provided in Appendix E.

[2] This will occur in cases where a garage sends out a double-header (two buses operate the same trip in tandem) or when a second bus replaces the original bus midway through the trip due to mechanical issues.

Table 21 summarizes the average age of assigned vehicles by mode for minority routes, non-minority routes, low-income routes, and non-low-income routes.

- The average age of buses assigned to minority routes is 3.9 years, less than the average of 4.8 years for non-minority routes.
- The average age of buses assigned low-income routes was 3.8 years, less than the average of 5.5 years for non-low-income routes.

These results indicate that the quality of buses assigned to minority and low-income routes is higher than the quality of buses assigned to non-minority and non-low-income routes.

Table 21. Average Age of Assigned Vehicles (Years)

Mode	Minority Routes	Non-Minority Routes	Low-Income Routes	Non-Low-Income Routes
Bus	3.9	4.8	3.8	5.5

Table 22 summarizes the difference from the expected age of vehicles available by mode for minority routes, non-minority routes, low-income routes, and non-low-income routes.

- The average age of buses assigned to minority routes is 1.1 years less than the average age of the buses available compared to an average of 0.7 years less for non-minority routes.
- The average age of buses assigned to low-income routes is 1.0 years less than the average age of the buses available compared to an average of 0.7 years less for non-low-income routes.

These results confirm the findings above that the quality of buses assigned to minority and low-income routes is higher than the quality of buses assigned to non-minority and non-low-income routes.

Table 22. Difference from Expected Age of Vehicles Available (Years)

Mode	Minority Routes	Non-Minority Routes	Low-Income Routes	Non-Low-Income Routes
Bus	-1.1	-0.7	-1.0	-0.7

Based on this analysis, no potential for disparate impact to minority populations or disproportionate burden to low-income populations is identified for the vehicle assignment standard.

Summary of Results

A summary of the results of each evaluation is shown in Table 23. No disparate impacts to minority populations were identified in these evaluations. Only one potential disproportionate burden to low-income populations was identified: Customer Information (System Maps). This result is discussed further in the next section.

Table 23. Summary of Results

Standard	Minority Results	Low-Income Results
Vehicle Load	No Disparate Impacts	No Disproportionate Burdens
Vehicle Headway	No Disparate Impacts	No Disproportionate Burdens
On-Time Performance	No Disparate Impacts	No Disproportionate Burdens
Service Availability	-	-
Route Spacing	No Disparate Impacts	No Disproportionate Burdens
Midday Service Availability	No Disparate Impacts	No Disproportionate Burdens
Stop/Station Spacing	No Disparate Impacts	No Disproportionate Burdens
Transit Amenities	-	-
Bus Shelter Amenities	No Disparate Impacts	No Disproportionate Burdens
Customer Information	No Disparate Impacts	Potential Disproportionate Burden Identified
Transit Facilities	No Disparate Impacts	No Disproportionate Burdens
Vehicle Assignment	No Disparate Impacts	No Disproportionate Burdens

Additional Analysis

Customer Information: System Map Displays

The results of this analysis identified a potential disproportionate burden to low-income populations. Full system maps are displayed at only 23 locations throughout the system and most of these maps are displayed at suburban park-and-rides that are served primarily by non-low-income routes. While some system maps are also displayed at urban transit centers and other facilities served by low-income routes, this is not enough to counterbalance the impact of the park-and-ride system maps.

The distribution of system map displays is currently being reevaluated by Metro Transit staff. System maps require a large amount of space and are difficult to maintain because they change quarterly. Local area maps showing all nearby routes are located on all LRT and Northstar station platforms. These maps show the immediate area around a stop or station. Local maps, which include common destinations in the area and show connecting bus routes, show more detail for customers trying to navigate the area.

Metro Transit has also embarked on a system-wide program to improve customer information at all transit stops. As of Fall 2015 approximately 2300 stops, including predominantly low-income and minority areas, have been upgraded. This project includes providing a map of the route(s) serving a particular stop, shelter or transit center at all bus stops with ten or more boardings a day. By 2017, approximately 25% of all bus stops (approximately 3,000 locations) will feature route level maps.

Service Availability: Route Spacing (Urban Crosstown, Market Area I)

The results of the analysis for this standard did not identify disparate impacts to minority populations or disproportionate burdens to low-income populations. However, the results for the minority analysis were very close to violating the four-fifths rule and warrant further discussion.

As noted previously the coverage of the urban crosstown routes in Market Area I is substantially lower than the coverage for the other route categories. This is primarily due to the limited crosstown service in portions of Saint Paul east of downtown and south of the Mississippi River. While these areas are heavily covered by urban radial service, the configuration of the street network and a number of natural barriers make the implementation of crosstown service difficult. Metro Transit is aware of these crosstown service gaps and makes efforts to restructure service to provide adequate transit service when feasible. Two new urban crosstown routes began operating in 2014 in an effort to improve crosstown coverage.

APPENDIX A: MINORITY/LOW-INCOME DESIGNATION

Table A: Minority and Low-Income Route Designations

Route	Percent Minority Coverage Area	Predominantly Minority Route	Percent Low-Income Coverage Area	Predominantly Low-Income Route	Type
2	51%	Y	87%	Y	Urban Crosstown
3	49%	Y	75%	Y	Urban Radial
4	23%	N	35%	Y	Urban Radial
5	78%	Y	71%	Y	Urban Radial
6	17%	N	25%	N	Urban Radial
7	47%	Y	56%	Y	Urban Radial
9	37%	Y	38%	Y	Urban Radial
10	48%	Y	68%	Y	Urban Radial
11	63%	Y	70%	Y	Urban Radial
12	20%	N	37%	Y	Urban Radial
14	54%	Y	48%	Y	Urban Radial
16	78%	Y	98%	Y	Urban Radial
17	27%	N	43%	Y	Urban Radial
18	53%	Y	64%	Y	Urban Radial
19	91%	Y	83%	Y	Urban Radial
20	68%	N	100%	N	Urban Radial (Shuttle)
21	53%	Y	63%	Y	Crosstown/Radial
22	70%	Y	59%	Y	Urban Radial
23	34%	Y	23%	N	Urban Crosstown
25	15%	N	29%	N	Urban Radial
27	92%	Y	96%	Y	Urban Crosstown
30	67%	Y	78%	Y	Urban Crosstown
32	61%	Y	64%	Y	Urban Crosstown
39	89%	Y	100%	Y	Urban Radial
46	24%	N	30%	N	Urban Crosstown
53	50%	Y	65%	Y	Crosstown/Radial
54	39%	Y	50%	Y	Urban Radial
59	51%	Y	68%	Y	Urban Radial
61	47%	Y	61%	Y	Crosstown/Radial
62	49%	Y	47%	Y	Urban Radial
63	42%	Y	57%	Y	Urban Radial
64	66%	Y	72%	Y	Crosstown/Radial
65	42%	Y	51%	Y	Urban Crosstown
67	60%	Y	80%	Y	Urban Radial
68	46%	Y	56%	Y	Urban Radial
70	36%	Y	32%	N	Urban Radial
71	60%	Y	69%	Y	Urban Radial
74	44%	Y	61%	Y	Urban Radial
75	49%	Y	41%	Y	Urban Radial
80	73%	Y	77%	Y	Urban Crosstown
83	27%	N	35%	Y	Urban Crosstown
84	23%	N	40%	Y	Urban Crosstown
87	26%	N	38%	Y	Urban Crosstown

Route	Percent Minority Coverage Area	Predominantly Minority Route	Percent Low-Income Coverage Area	Predominantly Low-Income Route	Type
94	64%	Y	89%	Y	Express
111	52%	Y	50%	Y	Express
113	24%	N	40%	Y	Express
114	20%	N	37%	Y	Express
115	17%	N	32%	N	Express
118	48%	Y	59%	Y	Express
129	72%	N	100%	N	Urban Radial (Shuttle)
133	49%	Y	34%	Y	Express
134	18%	N	54%	Y	Express
135	25%	N	31%	N	Express
141	21%	N	46%	Y	Express
146	11%	N	13%	N	Express
156	18%	N	21%	N	Express
219	31%	N	27%	N	Suburban Local
223	40%	Y	28%	N	Suburban Local
225	23%	N	1%	N	Suburban Local
227	22%	N	13%	N	Suburban Local
250	14%	N	9%	N	Express
252	11%	N	3%	N	Express
261	16%	N	19%	N	Express
262	23%	N	27%	N	Express
263	42%	Y	46%	Y	Express
264	16%	N	20%	N	Express
265	19%	N	20%	N	Express
270	25%	N	26%	N	Express
272	20%	N	19%	N	Express
275	0%	N	2%	N	Express
285	0%	N	7%	N	Express
288	0%	N	9%	N	Express
294	14%	N	20%	N	Express
350	56%	Y	31%	N	Express
351	32%	N	5%	N	Express
353	26%	N	5%	N	Express
355	26%	N	5%	N	Express
361	19%	N	22%	N	Express
364	18%	N	21%	N	Express
365	17%	N	18%	N	Express
375	19%	N	9%	N	Express
415	11%	N	6%	N	Suburban Local
417	8%	N	9%	N	Suburban Local
452	30%	N	36%	Y	Express
467	6%	N	11%	N	Express
515	50%	Y	45%	Y	Suburban Local
535	51%	Y	62%	Y	Express
537	18%	N	15%	N	Suburban Local
538	49%	Y	37%	Y	Suburban Local

Route	Percent Minority Coverage Area	Predominantly Minority Route	Percent Low-Income Coverage Area	Predominantly Low-Income Route	Type
539	32%	N	34%	Y	Suburban Local
540	49%	Y	30%	N	Suburban Local
542	45%	Y	51%	Y	Suburban Local
552	45%	Y	29%	N	Express
553	39%	Y	37%	Y	Express
554	53%	Y	57%	Y	Express
558	37%	Y	32%	N	Express
565	34%	Y	28%	N	Express
568	23%	N	32%	N	Urban Radial
578	27%	N	32%	N	Express
579	39%	Y	44%	Y	Express
587	30%	N	18%	N	Express
588	38%	Y	49%	Y	Express
589	17%	N	19%	N	Express
597	28%	N	29%	N	Express
604	24%	N	17%	N	Suburban Local
614	3%	N	17%	N	Suburban Local
615	28%	N	22%	N	Suburban Local
643	35%	Y	27%	N	Express
649	32%	N	24%	N	Express
652	17%	N	15%	N	Express
663	27%	N	24%	N	Express
664	40%	Y	56%	Y	Express
667	19%	N	36%	Y	Express
668	36%	Y	42%	Y	Express
670	13%	N	22%	N	Express
671	8%	N	10%	N	Express
672	14%	N	16%	N	Express
673	14%	N	12%	N	Express
674	4%	N	6%	N	Express
675	12%	N	10%	N	Express
677	6%	N	17%	N	Express
679	14%	N	12%	N	Express
705	33%	N	36%	Y	Suburban Local
716	64%	Y	51%	Y	Suburban Local
717	45%	Y	50%	Y	Suburban Local
721	53%	Y	52%	Y	Urban Radial
722	92%	Y	79%	Y	Suburban Local
723	95%	Y	59%	Y	Suburban Local
724	96%	Y	68%	Y	Urban Radial
755	35%	Y	37%	Y	Express
756	18%	N	25%	N	Express
758	24%	N	26%	N	Express
760	88%	Y	59%	Y	Express
761	91%	Y	62%	Y	Express
762	86%	Y	69%	Y	Express

Route	Percent Minority Coverage Area	Predominantly Minority Route	Percent Low-Income Coverage Area	Predominantly Low-Income Route	Type
763	84%	Y	44%	Y	Express
764	44%	Y	30%	N	Express
765	71%	Y	30%	N	Express
766	34%	Y	8%	N	Express
767	64%	Y	54%	Y	Express
768	48%	Y	10%	N	Express
801	48%	Y	53%	Y	Suburban Local
805	14%	N	35%	Y	Suburban Local
824	37%	Y	54%	Y	Express
825	15%	N	24%	N	Express
831	13%	N	17%	N	Suburban Local
850	9%	N	13%	N	Express
852	18%	N	34%	Y	Express
854	22%	N	31%	N	Express
860	15%	N	18%	N	Express
865	10%	N	1%	N	Express
Northstar	6%	N	10%	N	Commuter Rail
Blue Line	51%	Y	59%	Y	LRT
Green Line	62%	Y	87%	Y	LRT
Red Line	41%	Y	41%	Y	Highway BRT

Route Type Definitions

Urban Radial: Local routes serving central cities along dense corridors. They form the basic framework of the all-day bus network, providing people with essential connections to major activity centers and transitways.

Urban Crosstown: Local routes serving central cities on corridors that do not connect to a major regional job or activity center, such as a downtown. They are designed to complete the grid of urban bus routes and facilitate connections with urban locals and transitways.

Suburban Local: Routes that provide access to the transit network across large portions of the lower density portion of the transit service area, mostly in Transit Market Areas II and III. These routes tend to operate with less frequent trips and fewer hours of service.

Express: Designed primarily to bring people from urban and suburban residential areas to jobs in the region's major employment centers. Routes generally operate to serve the most common work start and end times and travel on the highway system with limited or no stops between park-and-rides and major employment centers.

Highway Bus Rapid Transit (BRT): A transitway mode that uses bus vehicles but incorporates characteristics of light rail or commuter rail to improve bus speed, reliability, and identity. Highway BRT station-to-station service is a route or coordinated set of routes that stop at all or most stations in the Highway BRT corridor as defined by stations and runningway infrastructure. It provides

service 7 days a week, 16 hours a day and at least every 10 minutes during peak periods with lower frequencies during midday and evenings. Weekend frequency is based on demand.

Light Rail Transit (LRT): Electrically powered trains operating primarily on an exclusive right-of-way with frequency, all-day service, and stops approximately one mile apart. It provides service 7 days a week, 16 hours a day and at least every 10 minutes during peak periods with lower frequencies during midday, evenings, and weekends.

Commuter Rail: A single route with associated stations, track (typically owned by others), and infrastructure. It provides at least 30-minute peak service. These lines operate on traditional railroad track typically between urban downtown areas and their suburbs, powered by a diesel locomotive or diesel multiple unit, with stops approximately five miles apart. Typically operates only during the morning and evening commute periods and route lengths extend more than 20 miles.

APPENDIX B: ON-TIME PERFORMANCE BY ROUTE

Table B: On-Time Performance by Route

Route	Predominantly Minority Route	Predominantly Low-Income Route	Type	Percent On-Time	Goal Met? (87.6%)
2	Y	Y	Urban Crosstown	86.4%	N
3	Y	Y	Urban Radial	83.8%	N
4	N	Y	Urban Radial	87.1%	N
5	Y	Y	Urban Radial	82.9%	N
6	N	N	Urban Radial	87.0%	N
7	Y	Y	Urban Radial	86.3%	N
9	Y	Y	Urban Radial	83.4%	N
10	Y	Y	Urban Radial	86.4%	N
11	Y	Y	Urban Radial	82.9%	N
12	N	Y	Urban Radial	85.8%	N
14	Y	Y	Urban Radial	87.0%	N
16	Y	Y	Urban Radial	92.2%	Y
17	N	Y	Urban Radial	84.1%	N
18	Y	Y	Urban Radial	86.1%	N
19	Y	Y	Urban Radial	78.9%	N
20	N	N	Urban Radial (Shuttle)	91.2%	Y
21	Y	Y	Crosstown/Radial	89.3%	Y
22	Y	Y	Urban Radial	81.6%	N
23	Y	N	Urban Crosstown	89.5%	Y
25	N	N	Urban Radial	81.6%	N
27	Y	Y	Urban Crosstown	90.4%	Y
30	Y	Y	Urban Crosstown	86.2%	N
32	Y	Y	Urban Crosstown	84.6%	N
39	Y	Y	Urban Radial	93.4%	Y
46	N	N	Urban Crosstown	90.7%	Y
53	Y	Y	Crosstown/Radial	87.1%	N
54	Y	Y	Urban Radial	89.8%	Y
59	Y	Y	Urban Radial	80.6%	N
61	Y	Y	Crosstown/Radial	87.3%	N
62	Y	Y	Urban Radial	91.0%	Y
63	Y	Y	Urban Radial	88.5%	Y
64	Y	Y	Crosstown/Radial	89.1%	Y
65	Y	Y	Urban Crosstown	97.6%	Y
67	Y	Y	Urban Radial	92.3%	Y
68	Y	Y	Urban Radial	92.4%	Y
70	Y	N	Urban Radial	87.5%	N
71	Y	Y	Urban Radial	92.8%	Y
74	Y	Y	Urban Radial	89.6%	Y
75	Y	Y	Urban Radial	91.6%	Y
80	Y	Y	Urban Crosstown	89.6%	Y
83	N	Y	Urban Crosstown	87.1%	N
84	N	Y	Urban Crosstown	89.4%	Y

Route	Predominantly Minority Route	Predominantly Low-Income Route	Type	Percent On-Time	Goal Met? (87.6%)
87	N	Y	Urban Crosstown	91.1%	Y
94	Y	Y	Express	88.3%	Y
111	Y	Y	Express	73.3%	N
113	N	Y	Express	85.4%	N
114	N	Y	Express	84.8%	N
115	N	N	Express	84.0%	N
118	Y	Y	Express	82.0%	N
129	N	N	Urban Radial (Shuttle)	88.3%	Y
133	Y	Y	Express	71.5%	N
134	N	Y	Express	79.6%	N
135	N	N	Express	75.4%	N
141	N	Y	Express	85.5%	N
146	N	N	Express	68.9%	N
156	N	N	Express	82.5%	N
219	N	N	Suburban Local	93.0%	Y
223	Y	N	Suburban Local	94.8%	Y
225	N	N	Suburban Local	82.5%	N
227	N	N	Suburban Local	91.2%	Y
250	N	N	Express	86.7%	N
252	N	N	Express	81.3%	N
261	N	N	Express	83.2%	N
262	N	N	Express	81.2%	N
263	Y	Y	Express	89.0%	Y
264	N	N	Express	93.5%	Y
265	N	N	Express	84.6%	N
270	N	N	Express	85.9%	N
272	N	N	Express	61.5%	N
275	N	N	Express	83.0%	N
285	N	N	Express	84.6%	N
288	N	N	Express	86.1%	N
294	N	N	Express	86.4%	N
350	Y	N	Express	82.6%	N
351	N	N	Express	92.3%	Y
353	N	N	Express	94.7%	Y
355	N	N	Express	90.4%	Y
361	N	N	Express	93.0%	Y
364	N	N	Express	54.5%	N
365	N	N	Express	86.7%	N
375	N	N	Express	91.0%	Y
415	N	N	Suburban Local	83.3%	N
417	N	N	Suburban Local	81.1%	N
452	N	Y	Express	85.6%	N
467	N	N	Express	81.9%	N
515	Y	Y	Suburban Local	95.7%	Y
535	Y	Y	Express	81.7%	N
537	N	N	Suburban Local	93.5%	Y

Route	Predominantly Minority Route	Predominantly Low-Income Route	Type	Percent On-Time	Goal Met? (87.6%)
538	Y	Y	Suburban Local	91.7%	Y
539	N	Y	Suburban Local	73.4%	N
540	Y	N	Suburban Local	85.5%	N
542	Y	Y	Suburban Local	87.1%	N
552	Y	N	Express	74.0%	N
553	Y	Y	Express	80.4%	N
554	Y	Y	Express	72.9%	N
558	Y	N	Express	81.4%	N
565	Y	N	Express	99.7%	Y
568	N	N	Urban Radial	79.9%	N
578	N	N	Express	79.0%	N
579	Y	Y	Express	82.0%	N
587	N	N	Express	78.3%	N
588	Y	Y	Express	73.3%	N
589	N	N	Express	78.9%	N
597	N	N	Express	76.3%	N
604	N	N	Suburban Local	92.0%	Y
614	N	N	Suburban Local	92.3%	Y
615	N	N	Suburban Local	77.7%	N
643	Y	N	Express	89.7%	Y
649	N	N	Express	82.7%	N
652	N	N	Express	87.5%	N
663	N	N	Express	84.7%	N
664	Y	Y	Express	74.8%	N
667	N	Y	Express	84.9%	N
668	Y	Y	Express	74.5%	N
670	N	N	Express	56.7%	N
671	N	N	Express	62.9%	N
672	N	N	Express	85.6%	N
673	N	N	Express	89.6%	Y
674	N	N	Express	83.3%	N
675	N	N	Express	87.5%	N
677	N	N	Express	70.7%	N
679	N	N	Express	85.2%	N
705	N	Y	Suburban Local	87.8%	Y
716	Y	Y	Suburban Local	91.6%	Y
717	Y	Y	Suburban Local	88.2%	Y
721	Y	Y	Urban Radial	88.3%	Y
722	Y	Y	Suburban Local	97.9%	Y
723	Y	Y	Suburban Local	89.9%	Y
724	Y	Y	Urban Radial	87.7%	Y
755	Y	Y	Express	84.5%	N
756	N	N	Express	82.2%	N
758	N	N	Express	83.2%	N
760	Y	Y	Express	84.7%	N
761	Y	Y	Express	77.8%	N

Route	Predominantly Minority Route	Predominantly Low-Income Route	Type	Percent On-Time	Goal Met? (87.6%)
762	Y	Y	Express	85.4%	N
763	Y	Y	Express	84.2%	N
764	Y	N	Express	79.2%	N
765	Y	N	Express	88.5%	Y
766	Y	N	Express	84.7%	N
767	Y	Y	Express	86.5%	N
768	Y	N	Express	81.9%	N
801	Y	Y	Suburban Local	90.7%	Y
805	N	Y	Suburban Local	70.9%	N
824	Y	Y	Express	79.1%	N
825	N	N	Express	82.7%	N
831	N	N	Suburban Local	93.3%	Y
850	N	N	Express	89.4%	Y
852	N	Y	Express	84.6%	N
854	N	N	Express	81.9%	N
860	N	N	Express	72.8%	N
865	N	N	Express	75.8%	N
Northstar	N	N	Commuter Rail	61.6%	N
Blue Line	Y	Y	LRT	92.1%	Y
Green Line	Y	Y	LRT	73.0%	N
Red Line	Y	Y	Highway BRT	94.2%	N

APPENDIX C: TRANSIT CENTER FACILITY AMENITIES

Table C: Transit Center Amenities

Transit Center	Lights	Heater	Trash Receptacle	Bench
Rosedale	Yes	Yes	Yes	Yes
Louisiana Transit Ctr-St L Pk	Yes	Yes	Yes	Yes
Chicago Lake Transit Center	Yes	Yes	Yes	Yes
Brooklyn Center Transit Ctr	Yes	Yes	Yes	Yes
So Bloomington Transit Ctr	Yes	Yes	Yes	Yes
SunRay-St Paul	Yes	Yes	Yes	Yes
Plymouth Rd Transit Ctr-Mtka	Yes	Yes	Yes	Yes
Starlite Transit Center	Yes	Yes	Yes	Yes
Northtown Hub-Blaine	Yes	Yes	Yes	Yes
Robbinsdale Transit Center	Yes	Yes	Yes	Yes
Uptown Transit Center-Mpls	Yes	Yes	Yes	Yes
Columbia Heights Transit Ctr	Yes	Yes	Yes	Yes
Little Canada Transit Center	Yes	No	Yes	Yes
Maplewood Mall	Yes	Yes	Yes	Yes
Southdale-Edina	Yes	Yes	Yes	Yes
38th St Transit Center-Mpls	Yes	Yes	Yes	Yes
46th St Transit Center-Mpls	Yes	Yes	Yes	Yes
Mall of America Station	Yes	Yes	Yes	Yes

APPENDIX D: PARK-AND-RIDE FACILITY AMENITIES

Table D: Transit Center Amenities

Transit Center	Lights	Heater	Trash	Bench
Como & Eustis	Yes	No	No	Yes
Co Rd 73 & I-394 South	Yes	Yes	Yes	Yes
Hwy 61 & Lower Afton Rd	Yes	No	Yes	Yes
General Mills Blvd & I-394	Yes	Yes	Yes	Yes
Park Place & I-394	Yes	No	Yes	Yes
Foley Blvd	Yes	Yes	Yes	Yes
65th Ave & Brooklyn Blvd	Yes	Yes	Yes	Yes
I-35W & 95th Ave	Yes	Yes	Yes	Yes
Hwy 610 & Noble	Yes	Yes	Yes	Yes
Woodbury Theatre	Yes	Yes	Yes	No
Cottage Grove	Yes	Yes	Yes	Yes
63rd Ave & Bottineau Blvd	Yes	Yes	Yes	Yes
I-35 &Kenrick Avenue	Yes	Yes	Yes	Yes
I-35W & Co Rd C	Yes	Yes	Yes	Yes
I-35W & Co Rd H	Yes	No	Yes	Yes
Hwy 61 & Co Rd C	Yes	No	No	Yes
West River Rd & 117th Ave	Yes	No	No	Yes
Guardian Angels Catholic Church	Yes	Yes	Yes	Yes
Wayzata Blvd & Barry Ave	Yes	Yes	Yes	Yes
Knox Avenue at Best Buy	Yes	Yes	No	No
Hwy 7 & Vinehill Rd	Yes	No	No	No
Lakeville Cedar	Yes	Yes	Yes	Yes
Paul Pkwy	Yes	No	Yes	Yes
Hwy 36 & Rice St	Yes	Yes	Yes	Yes
I-35E & Co Rd 14	Yes	No	Yes	Yes
I-35E & Co Rd E	Yes	No	Yes	Yes
Maplewood Mall Transit Center	Yes	Yes	Yes	Yes
Southdale Transit Center	Yes	Yes	Yes	Yes

APPENDIX E: VEHICLE ASSIGNMENT SUMMARY BY ROUTE

Table E: Vehicle Assignment Summary by Route

Route	Minority Route? (>1/3)	Low-Income Route? (>1/3)	Type	Average Age Assigned	Average Age Available	Variance (Assigned-Available)	Outcome
2	Y	Y	Local	9.2	8.6	0.6	Older
3	Y	Y	Local	3.8	3.5	0.3	Older
4	N	N	Local	7.4	6.9	0.5	Older
5	Y	Y	Local	4.9	5.1	-0.2	Newer
6	N	N	Local	6.1	6.0	0.2	Older
7	Y	Y	Local	5.7	6.2	-0.4	Newer
8	Y	Y	Local	10.5	9.4	1.1	Older

Route	Predominantly Minority Route	Predominantly Low-Income Route	Type	Average Age Assigned	Average Age Available	Difference (Assigned-Available)
2	Y	Y	Urban Crosstown	4.6	5.8	(1.2)
3	Y	Y	Urban Radial	5.7	6.1	(0.4)
4	N	Y	Urban Radial	4.8	6.1	(1.3)
5	Y	Y	Urban Radial	2.9	5.5	(2.6)
6	N	N	Urban Radial	3.9	5.1	(1.2)
7	Y	Y	Urban Radial	2.7	6.0	(3.3)
9	Y	Y	Urban Radial	4.5	5.7	(1.2)
10	Y	Y	Urban Radial	4.9	5.4	(0.5)
11	Y	Y	Urban Radial	5.9	5.3	0.6
12	N	Y	Urban Radial	2.3	1.7	0.6
14	Y	Y	Urban Radial	3.6	5.9	(2.3)
16	Y	Y	Urban Radial	2.9	5.8	(3.0)
17	N	Y	Urban Radial	4.6	5.3	(0.7)
18	Y	Y	Urban Radial	5.1	5.3	(0.2)
19	Y	Y	Urban Radial	2.3	4.9	(2.6)
20	N	N	Urban Radial (Shuttle)	6.0	8.8	(2.8)
21	Y	Y	Crosstown/Radial	3.2	3.7	(0.5)
22	Y	Y	Urban Radial	2.8	5.3	(2.5)
23	Y	N	Urban Crosstown	4.9	5.8	(0.9)
25	N	N	Urban Radial	5.2	5.4	(0.2)
27	Y	Y	Urban Crosstown	2.0	2.6	(0.6)
30	Y	Y	Urban Crosstown	2.7	5.8	(3.0)
32	Y	Y	Urban Crosstown	5.6	5.7	(0.1)
39	Y	Y	Urban Radial	6.0	5.7	0.3
46	N	N	Urban Crosstown	4.7	5.8	(1.1)
53	Y	Y	Crosstown/Radial	6.2	5.5	0.7
54	Y	Y	Urban Radial	3.9	5.9	(1.9)
59	Y	Y	Urban Radial	5.2	5.5	(0.3)

Route	Predominantly Minority Route	Predominantly Low-Income Route	Type	Average Age Assigned	Average Age Available	Difference (Assigned-Available)
61	Y	Y	Crosstown/Radial	4.2	5.7	(1.5)
62	Y	Y	Urban Radial	3.1	4.7	(1.6)
63	Y	Y	Urban Radial	3.8	3.9	(0.1)
64	Y	Y	Crosstown/Radial	3.7	3.9	(0.2)
65	Y	Y	Urban Crosstown	5.2	4.7	0.4
67	Y	Y	Urban Radial	3.8	5.3	(1.5)
68	Y	Y	Urban Radial	3.7	4.1	(0.4)
70	Y	N	Urban Radial	3.4	4.7	(1.3)
71	Y	Y	Urban Radial	3.6	4.7	(1.2)
74	Y	Y	Urban Radial	3.3	4.7	(1.4)
75	Y	Y	Urban Radial	3.7	4.7	(1.0)
80	Y	Y	Urban Crosstown	8.7	4.2	4.5
83	N	Y	Urban Crosstown	2.0	2.6	(0.6)
84	N	Y	Urban Crosstown	4.5	5.8	(1.3)
87	N	Y	Urban Crosstown	1.6	4.2	(2.6)
94	Y	Y	Express	5.7	5.9	(0.2)
111	Y	Y	Express	7.9	6.6	1.3
113	N	Y	Express	6.7	5.5	1.1
114	N	Y	Express	7.2	5.8	1.4
115	N	N	Express	3.4	3.4	0.1
118	Y	Y	Express	6.6	5.8	0.8
129	N	N	Urban Radial (Shuttle)	6.2	5.8	0.4
133	Y	Y	Express	4.7	5.6	(0.9)
134	N	Y	Express	6.6	5.8	0.8
135	N	N	Express	7.2	7.6	(0.4)
141	N	Y	Express	6.4	5.8	0.7
146	N	N	Express	4.1	4.5	(0.5)
156	N	N	Express	7.2	5.8	1.4
219	N	N	Suburban Local	2.1	2.1	0.0
223	Y	N	Suburban Local	1.9	2.6	(0.6)
225	N	N	Suburban Local	1.9	2.6	(0.7)
227	N	N	Suburban Local	1.9	2.6	(0.7)
250	N	N	Express	7.1	6.9	0.2
252	N	N	Express	6.0	6.2	(0.2)
261	N	N	Express	4.7	7.0	(2.3)
262	N	N	Express	6.6	4.7	1.9
263	Y	Y	Express	6.8	6.4	0.4
264	N	N	Express	4.9	6.5	(1.7)
265	N	N	Express	8.6	7.1	1.5
270	N	N	Express	6.2	6.4	(0.2)
272	N	N	Express	10.5	11.4	(0.9)
275	N	N	Express	5.7	6.7	(1.0)
285	N	N	Express	6.3	6.4	(0.1)

Route	Predominantly Minority Route	Predominantly Low-Income Route	Type	Average Age Assigned	Average Age Available	Difference (Assigned-Available)
288	N	N	Express	4.7	4.8	(0.1)
294	N	N	Express	7.0	6.5	0.5
350	Y	N	Express	10.0	9.7	0.3
351	N	N	Express	5.9	5.6	0.3
353	N	N	Express	6.9	4.7	2.1
355	N	N	Express	6.2	6.2	(0.1)
361	N	N	Express	6.3	8.6	(2.3)
364	N	N	Express	4.0	4.1	(0.1)
365	N	N	Express	5.8	6.0	(0.2)
375	N	N	Express	7.0	6.7	0.3
415	N	N	Suburban Local	4.2	4.7	(0.5)
417	N	N	Suburban Local	4.1	2.6	1.5
452	N	Y	Express	4.2	4.7	(0.5)
467	N	N	Express	3.8	3.8	0.0
515	Y	Y	Suburban Local	3.8	6.6	(2.7)
535	Y	Y	Express	6.5	6.6	(0.1)
537	N	N	Suburban Local	2.1	4.2	(2.1)
538	Y	Y	Suburban Local	1.8	4.2	(2.4)
539	N	Y	Suburban Local	1.6	4.2	(2.6)
540	Y	N	Suburban Local	2.4	4.2	(1.8)
542	Y	Y	Suburban Local	8.5	8.5	(0.1)
552	Y	N	Express	6.0	5.4	0.7
553	Y	Y	Express	8.7	6.6	2.1
554	Y	Y	Express	5.4	5.5	(0.1)
558	Y	N	Express	9.2	6.6	2.6
565	Y	N	Express	5.0	6.6	(1.6)
568	N	N	Urban Radial	5.0	5.5	(0.5)
578	N	N	Express	7.7	5.9	1.9
579	Y	Y	Express	9.8	6.6	3.3
587	N	N	Express	7.3	6.0	1.3
588	Y	Y	Express	9.3	6.6	2.8
589	N	N	Express	8.6	6.3	2.4
597	N	N	Express	6.3	5.1	1.2
604	N	N	Suburban Local	2.1	2.6	(0.5)
614	N	N	Suburban Local	2.1	2.6	(0.5)
615	N	N	Suburban Local	2.0	2.6	(0.5)
643	Y	N	Express	6.2	5.7	0.4
649	N	N	Express	5.9	5.8	0.1
652	N	N	Express	6.1	5.6	0.5
663	N	N	Express	7.3	7.6	(0.4)
664	Y	Y	Express	5.9	5.7	0.1
667	N	Y	Express	5.1	5.9	(0.8)
668	Y	Y	Express	5.4	5.6	(0.1)

Route	Predominantly Minority Route	Predominantly Low-Income Route	Type	Average Age Assigned	Average Age Available	Difference (Assigned-Available)
670	N	N	Express	11.3	9.7	1.6
671	N	N	Express	11.5	9.7	1.8
672	N	N	Express	4.8	5.7	(0.9)
673	N	N	Express	5.8	6.3	(0.5)
674	N	N	Express	6.4	6.8	(0.4)
675	N	N	Express	3.5	6.6	(3.1)
677	N	N	Express	5.4	7.0	(1.6)
679	N	N	Express	5.2	5.4	(0.2)
705	N	Y	Suburban Local	5.6	5.6	0.0
716	Y	Y	Suburban Local	2.0	2.6	(0.6)
717	Y	Y	Suburban Local	1.8	2.6	(0.7)
721	Y	Y	Urban Radial	1.9	3.9	(2.0)
722	Y	Y	Suburban Local	2.0	3.8	(1.8)
723	Y	Y	Suburban Local	1.6	3.8	(2.2)
724	Y	Y	Urban Radial	2.6	4.4	(1.8)
755	Y	Y	Express	5.1	5.6	(0.5)
756	N	N	Express	5.4	5.5	(0.1)
758	N	N	Express	5.6	5.7	0.0
760	Y	Y	Express	8.7	9.0	(0.3)
761	Y	Y	Express	4.5	5.3	(0.8)
762	Y	Y	Express	1.8	3.8	(2.0)
763	Y	Y	Express	7.3	8.1	(0.8)
764	Y	N	Express	4.7	5.1	(0.5)
765	Y	N	Express	6.7	6.4	0.3
766	Y	N	Express	5.8	6.6	(0.9)
767	Y	Y	Express	5.2	5.3	(0.1)
768	Y	N	Express	6.2	6.8	(0.5)
801	Y	Y	Suburban Local	3.9	3.9	0.0
805	N	Y	Suburban Local	3.9	3.9	0.0
824	Y	Y	Express	6.7	6.7	0.0
825	N	N	Express	6.4	5.9	0.5
831	N	N	Suburban Local	3.9	3.9	0.0
850	N	N	Express	8.5	9.0	(0.5)
852	N	Y	Express	3.0	4.9	(1.9)
854	N	N	Express	6.3	7.0	(0.7)
860	N	N	Express	8.2	7.6	0.6
865	N	N	Express	0.4	0.3	0.0
Northstar	N	N	Commuter Rail	No Data	No Data	No Data
Blue Line	Y	Y	LRT	No Data	No Data	No Data
Green Line	Y	Y	LRT	No Data	No Data	No Data
Red Line	Y	Y	BRT	1.7	1.7	0.0