



Title VI Service Equity Analysis

July 31st, 2024

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1 – Introduction

In June 2023, Metro Transit (Metro) overhauled its network design for the first time in 25 years with the Transit Network Redesign. Throughout this transition, Metro actively sought feedback from riders to create a system that better meets their needs. Over the past year, Metro has carefully considered this feedback and implemented a series of incremental improvements. Some of these service improvements were temporary solutions, while others have become permanent fixtures in Metro's regular service plan.

As a recipient of Federal funding through the Federal Transit Administration (FTA), Metro is required to comply with the Title VI regulations established in FTA Circular 4702.1B. This includes a requirement to conduct a Service Equity Analysis of Major Service Changes. The FTA allows for an exception for temporary service additions that would otherwise qualify as a Major Service Change, so long as they are in service no longer than 12-months. As it has been a year since the Redesign, this Service Equity Analysis includes all service changes that were implemented since the Transit Network Redesign that have been included in Metro's regular service plan.

2 – Title VI Regulatory Requirements

Section 601 of Title VI of the Civil Rights Act of 1964 states:

“No person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving federal financial assistance.”

As one of ten operating agencies within the United States Department of Transportation, The Federal Transit Administration (FTA) provides financial assistance to develop, operate, and maintain transit systems across the country. The FTA requires all recipients of financial assistance to comply with Title VI and has established regulatory guidance in FTA Circular 4702.1B. As a recipient of financial assistance from the FTA, Metro Transit is required to comply with all applicable regulations contained in Circular 4702.1B.

2.1 – Requirement to Conduct Service Equity Analysis

Chapter IV of FTA Circular 4702.1B establishes requirements and guidelines specific to fixed route transit providers. The requirements in this chapter are scaled based on the size of the transit provider, with smaller providers have fewer reporting requirements. Transit providers that operate 50 or more fixed route vehicles in peak service, or that operate within an urbanized area with a population greater than 200,000 are required to conduct a Service Equity Analysis for any service change that qualifies as a Major

Service Change.¹ The FTA allows temporary service additions that would otherwise qualify as a Major Service Change, so long as they are in service no longer than 12-months.²

As a transit provider that operates in an urbanized area with a population greater than 200,000 and has more than 50 buses operating in peak service, Metro is required to conduct a Service Equity Analysis for Major Service Changes. Service Equity Analyses utilize quantitative methods to determine if there is evidence of a potential Disparate Impact on minority populations or Disproportionate Burden on low-income populations. Major Service Changes, Disparate Impacts, and Disproportionate Burdens are defined by the FTA as the following:³

Major Service Change: The FTA requires transit providers to establish a policy that defines when service changes are considered “major service changes”. This is typically numerical standard, such as the percentage of route hours or miles. See section 3.1 for Metro Transit’s Major Service Change Policy.

Disparate Impact: A Disparate Impact refers to facially neutral policy or practice that disproportionately affects members of a group identified by race, color, or national origin, where the recipient’s policy or practice lacks a substantial legitimate justification and where there exists one or more alternatives that would serve the same legitimate objectives but with less disproportionate effect on the basis of race, color, or national origin.

Disproportionate Burden: A Disproportionate Burden refers to a neutral policy or practice that disproportionately affects low-income populations more than non-low-income populations.

3 – Metro Transit Title VI Policies

FTA Circular 4702.1B requires transit providers to establish several policies that will be used when conducting Service and Fare Equity Analyses. These include the major service change policy, disparate impact policy, and disproportionate burden policy. These policies are established with public input and are enumerated in Metro’s Title VI Program, which is updated every three years. Metro’s policies are described below.

3.1 – Major Service Change Policy

Metro Transit’s Major Service Change Policy in compliance with applicable federal requirements (Title VI of the Civil Rights Act 1964, 49 CFR Section 21 and FTA Circular 4702.1B). The Federal Transit Administration (FTA) requires that recipients of FTA funding prepare and submit service equity analyses for proposed major service changes. The purpose of this policy is to establish a threshold that defines a major

¹ FTA Circular 4702.1B Chapter IV-12

² FTA Circular 4702.1B Chapter IV-13

³ FTA Circular 4702.1B Chapter I-2.

service change and a recipient's definition of an adverse effect caused by a major service change.

Currently, Metro Transit will consider any service changes that qualify for a public hearing as "major" and in need of analysis under Title VI. Service changes that require a public hearing are currently defined as:

- The establishment of new bus routes
- A substantial geographical alteration on a given route of more than 25% of its route miles
- The elimination of any bus service
- A major modification which causes a 25% or greater change in the number of daily service hours provided

All major service changes will be subject to an equity analysis which includes an analysis of adverse effects. An adverse effect is defined as a geographical or temporal reduction in service which includes but is not limited to: elimination of a route, rerouting an existing route and a decrease in frequency. Metro Transit shall consider the degree of adverse effects, and analyze those effects, when planning major service changes.

3.2 – Disparate Impact & Disproportionate Burden Policies

FTA Circular 4702.1B requires transit providers to establish Disparate Impact and Disproportionate Burden policies that establish thresholds to determine whether the adverse effects of a proposed service or fare change are excessively borne by minority or low-income populations. Metro Transit's Disparate Impact and Disproportionate Burden policy thresholds were approved by the City of Madison Transportation Commission on September 13th, 2023 as part of its Title VI Program update. Metro has not made any changes to these policy thresholds since they were originally adopted as part of its 2019 Title VI Program update. Therefore, for the purposes of this analysis, Metro utilized the following definitions to identify potential Disparate Impacts or Disproportionate Burdens:

“The Disparate Impact threshold is described as follows for Metro Transit: Should the burden of any major service change require a minority population/ridership (33% threshold) to bear adverse effects greater or less than 2% than those borne by the non-minority population/ridership, that impact will be considered a disparate impact.”

4 – Service Change Summary

Following the Redesign's rollout in June 2023, Metro began assessing rider feedback to fine-tune its service. Some modifications were initially intended as short-term remedies while staff gathered data and explored alternative service options, but many of these changes that responded to ridership demand were subsequently integrated into Metro's standard service plan. The following sections provide a summary of each of these service adaptations. Given this analysis's focus on service changes sustained for over a year, only adjustments included in Metro's regular service plan are included. A previous equity analysis was completed for the main June 2023 Redesign as part of the approval of those changes by the Transportation Commission and Common Council and this new equity analysis is intended to be the follow up document.

4.1 – Short Turn Routes

Much of the planning for the Redesign occurred in the midst of the COVID-19 pandemic, when there were major changes to peak demand for bus service and much of the impact of the peak on the new Redesign service was unknown. Since the Redesign launched in the summer without extra peak demands from students, Metro waited until the regular August service change before implementing some of this service, which were traditionally run as seasonal extra trips Pre-COVID.

In September 2023, the University of Wisconsin began its Fall semester, bringing thousands of students back to the Madison area and straining the capacity of several Metro routes serving the UW campus and surrounding areas. Metro staff then analyzed overload complaints and customer feedback.

This resulted in the addition of extra service, which operated on the busiest part of a corridor to reduce congestion on regularly scheduled service. These 'short-turn' buses were placed on existing routes A, F, R, 28, and 38. Due to our lead time requirements for registering new trips in our data system, many of these extra buses originally ran off a 'paper' service outside of real-time apps that was meant to be temporary, with the eventual plan to formalize this service. This was done as part of the March 2024 service changes which also provided real-time information for passengers.

Figure 1 – Route 38 Short Turn

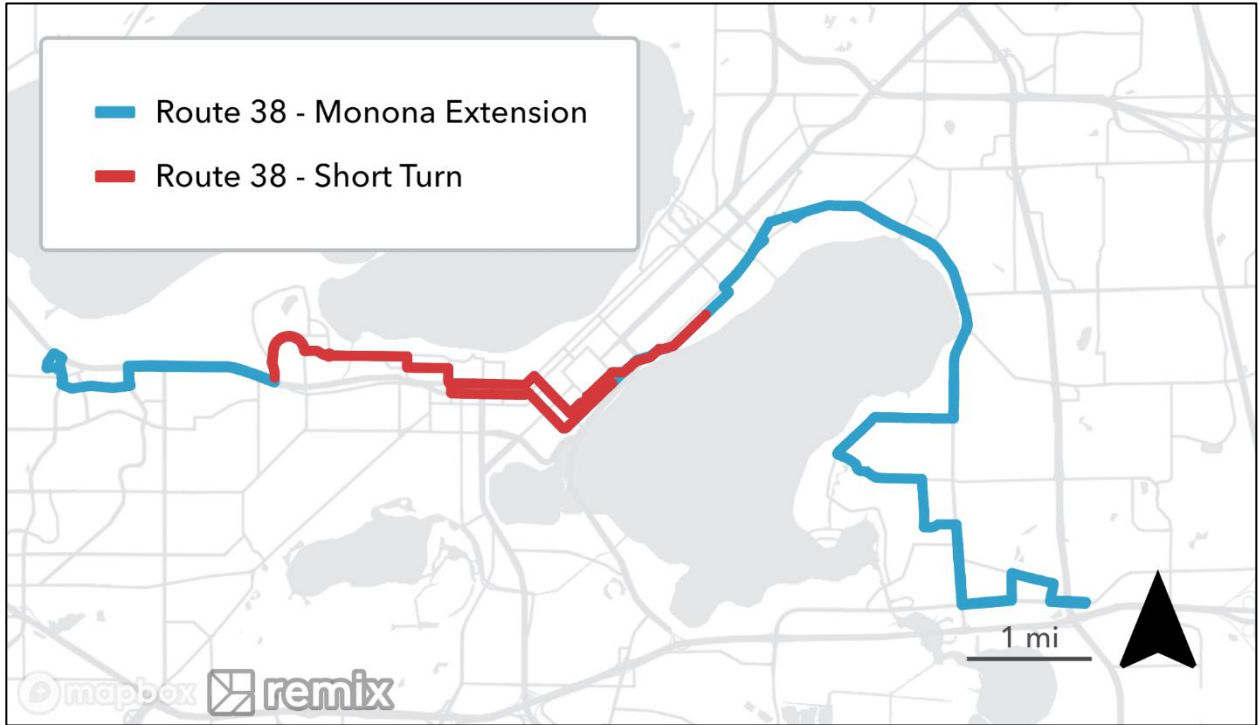


Figure 2 – Route 28 Short Turn



Figure 3 – Route A Short Turn

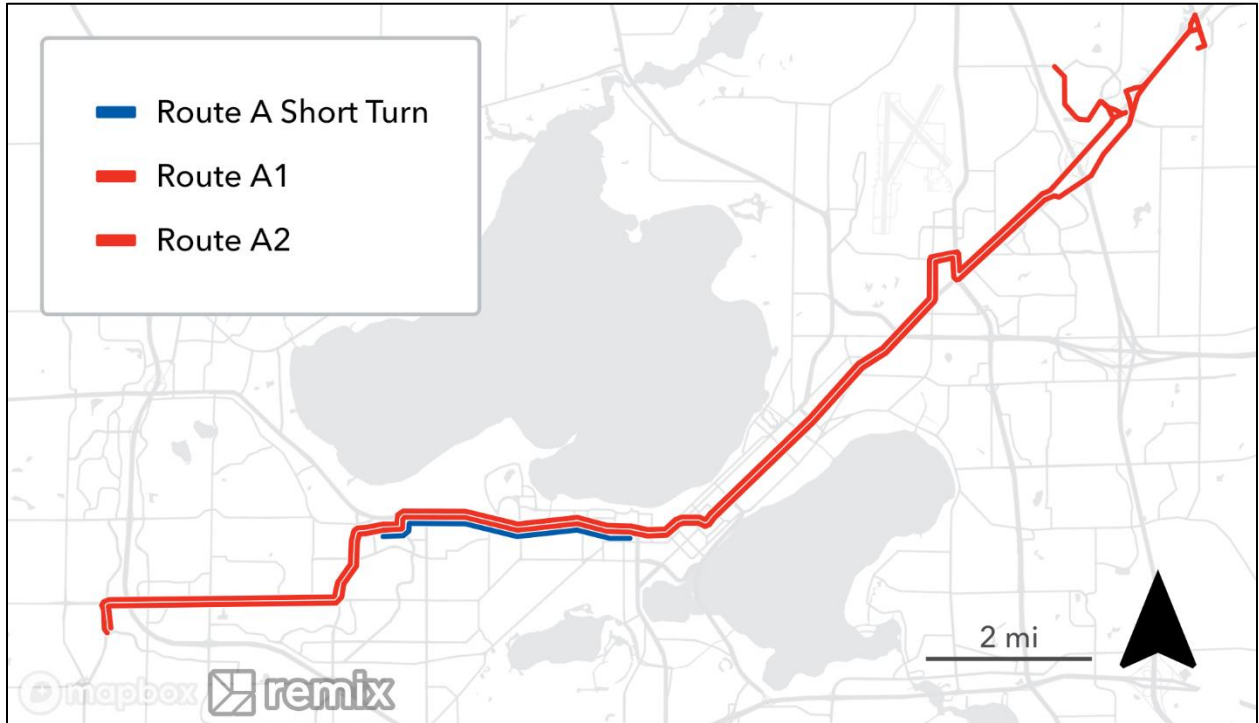


Figure 4 – Route R Short Turn

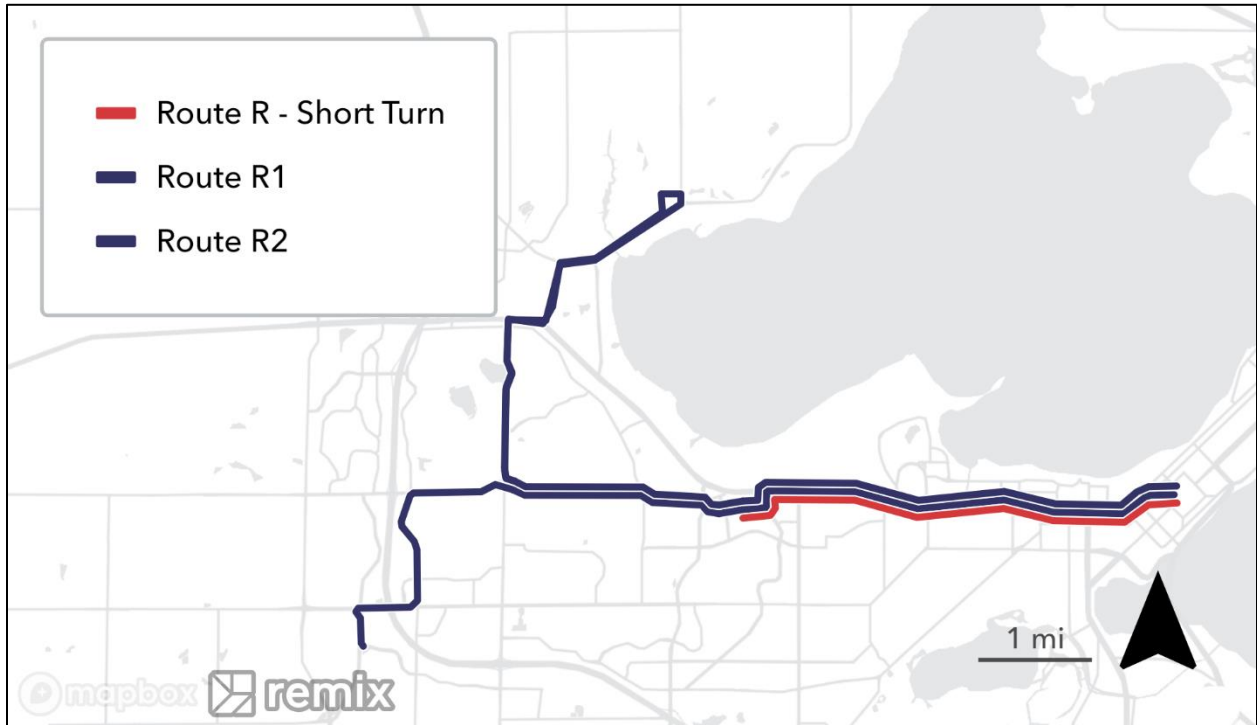
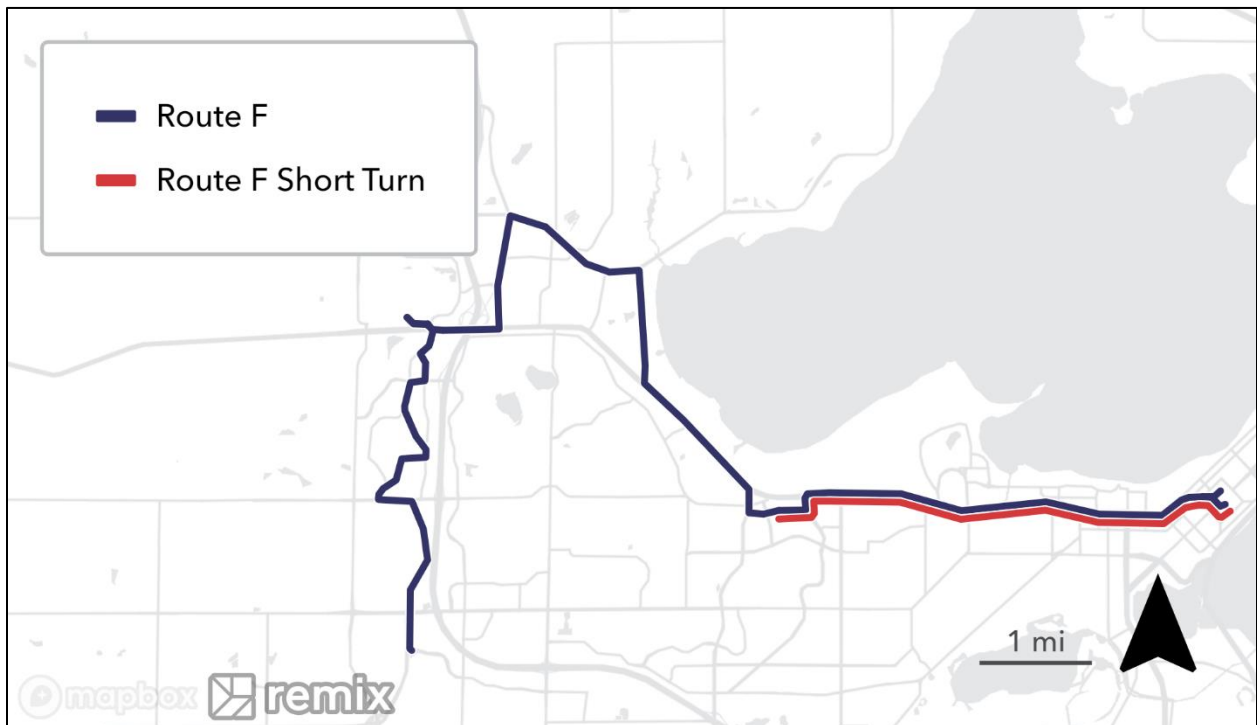


Figure 5 – Route F Short Turn



4.2 – Route 28 Extension

The June 2023 Redesign retained parts of the old Route 28, with a new western terminus at the intersection of University Bay Drive and University Avenue. In September, the University of Wisconsin (UW) began its Fall session, and an influx of students returned to Madison. This additional demand created capacity and on-time performance problems for several routes (A, F, R, 38) serving Sheboygan Avenue, which had a large proportion of students and UW Hospital staff. To address the increased demand, Metro extended the alignment of Route 28 further west down its original routing with its December service changes, locating the new terminus at the intersection of Sheboygan Ave and Whitney Way. In March, Metro extended Route 28 further to the west to its original pre-Redesign terminus at University Row, which is adjacent to a large apartment complex and UW Hospital branch with better break facilities for bus drivers.

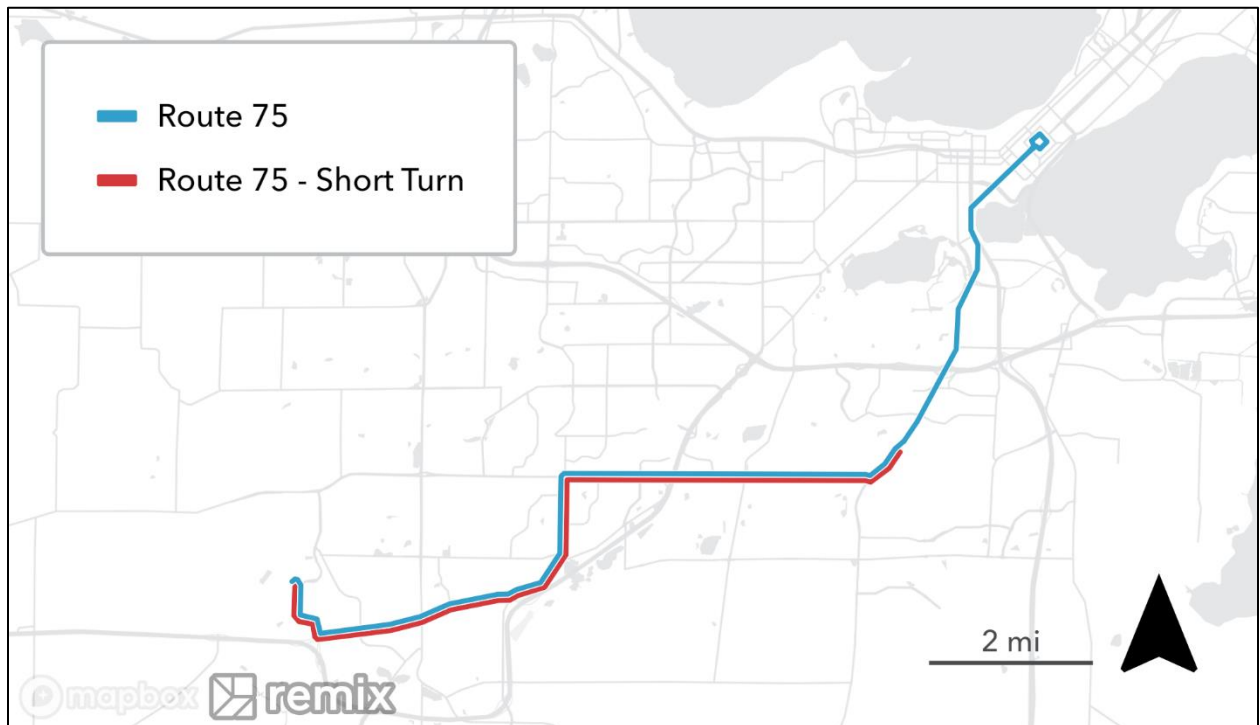
Figure 6 – Route 28 Extension



4.3 – Route 75 Short Turn

Route 75 is a weekday peak commuter route operating between downtown Madison and the Epic campus in the City of Verona that is funded by the Epic Systems. Seeing significant demand for additional service, Metro’s partners at Epic requested options for additional bus service. In order to maximize efficient use of resources, Metro proposed, and subsequently implemented, ‘short-turn’ Route 75 trips that begin at the Epic campus and terminate at Fish Hatchery Road and Caddis Bend. Riders then have an opportunity to connect to Route B, which is the future North-South BRT route with a 15-minute headway.

Figure 7 – Route 75 Short Turn

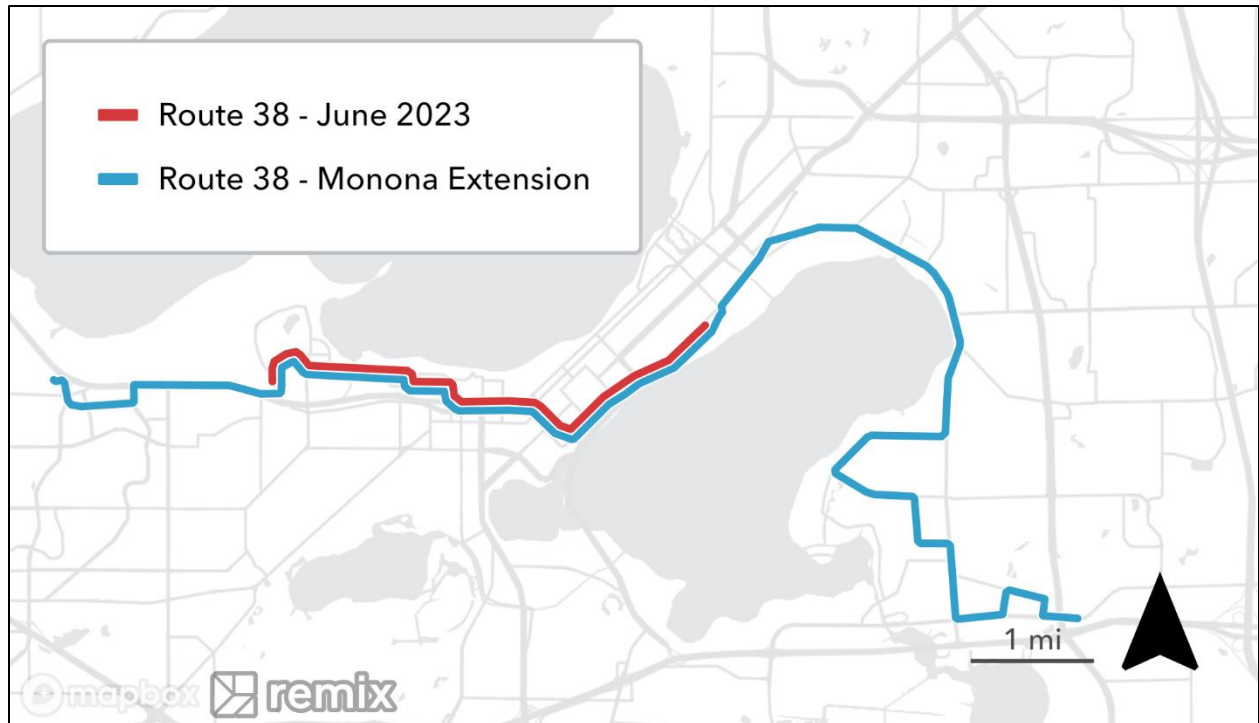


4.4 – Route 38 Extension to the City of Monona

After the launch of the June Redesign, Metro received significant feedback from riders requesting that the original alignment of Route 38 be restored along University Ave to Sheboygan Avenue and Eau Claire Avenue. In response to this rider request and boarding data, this change was implemented in Metro’s August 2023 service changes. In March, Metro extended Route 38 further to the west, terminating at University Row, which is the original terminus of the Pre-Redesign Route 28 and 38, once again for better break facilities and ridership generators.

In December 2023, the City of Monona’s Transit Commission passed a resolution directing its staff to enter into an agreement to provide Metro service to its residents. The approved plan will extend Metro’s Route 38 into the Monona City Limits and adds stops within the City of Monona on Routes G & H. This service is planned to be launched in March 2025 and is included in this equity analysis.

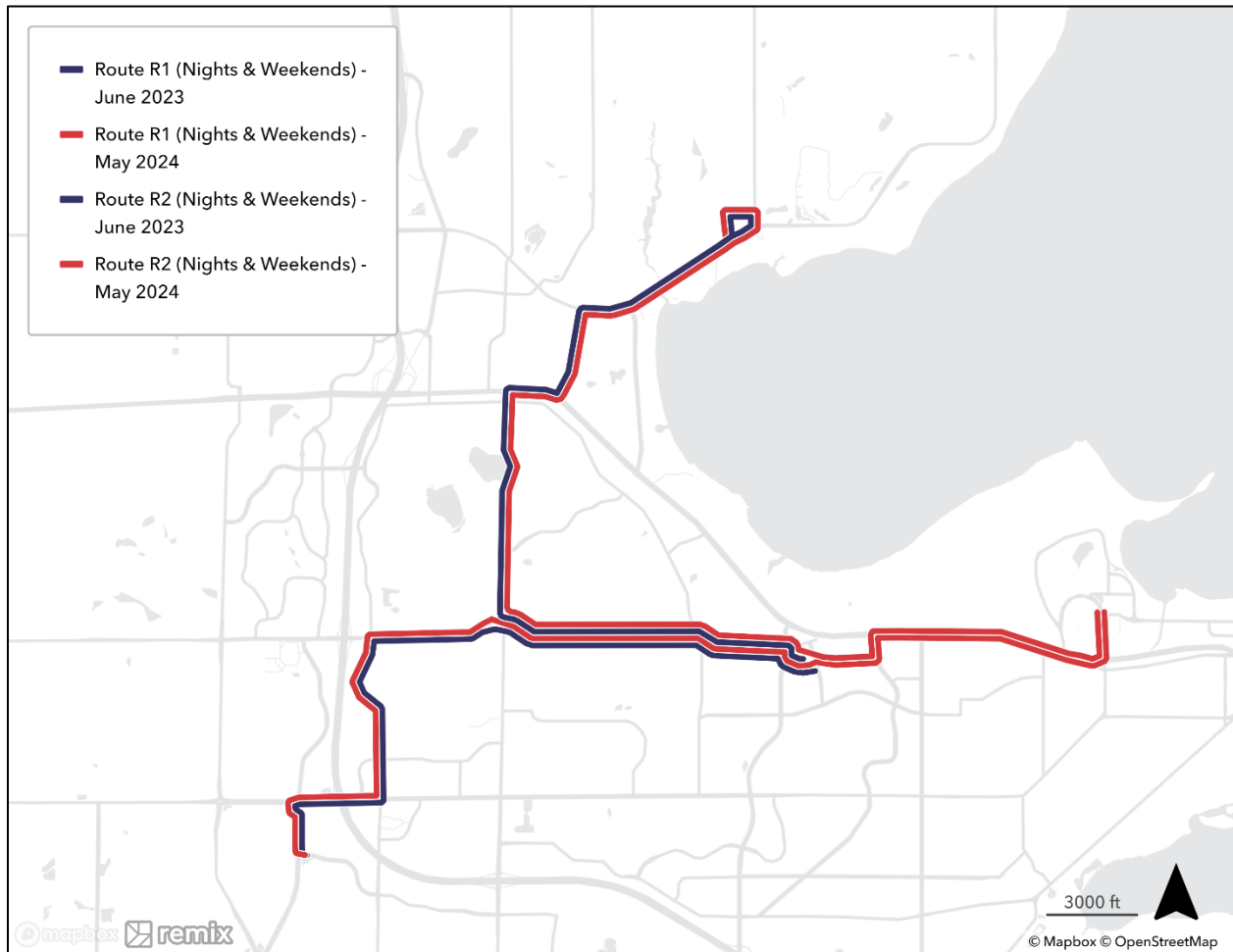
Figure 8 – Route 38 Monona Extension



4.5 – Routes R & C Interline

The original service plan in the Transit Network Redesign planned for Route R to terminate at the intersection of Sheboygan Avenue and Eau Claire Avenue after 7 PM on weekdays and all day on weekends. Metro received feedback that there was a significant number of riders that desired a direct connection to the UW hospital via Route R, especially in off-peak times when Routes 28 and 38 were not running. To accomplish this economically, Metro thru ran or interlined Route R and Route C at the UW hospital off-peak allowing riders to stay on the bus from C-R or R-C. Implemented in the December Pick, this change has been popular with riders.

Figure 9 – Routes R & C Interline



5 – Quantitative Analysis

As required by FTA Circular 4702.1B, Metro analyzed the impact of the refinements to the Transit Network Redesign to determine if there is evidence of potential Disparate Impacts or Disproportionate Burdens resulting from these changes. This analysis utilizes the 2% threshold established in Metro’s Disparate Impact Policy to make this determination. The methodology and results of this analysis are described below.

5.1 – Methodology

Metro staff utilized Remix software to conduct the quantitative analysis. Remix utilizes a “people-trips” methodology to compare the impact of service changes on minority and low-income populations. In general, the people-trips methodology calculates the number of people within ¼ mile of a transit stop and multiplies that number by the annual number of trips that serve that stop. This results in the number of trips possible in a particular service scenario.

The total number people-trips, along with the proportion of minority and low-income people trips, is compared between scenarios. This is then compared to the area average for minority and low-income populations to determine if the difference exceeds Metro’s established thresholds. If the difference does exceed the thresholds, and the impact of the changes imposes an adverse effect, then there is evidence of a potential Disparate Impact or Disproportionate Burden. A detailed explanation of the methodology employed in this study can be found below:⁴

Data sources

- Demographic data comes from the US Census Bureau, 2018-2022 American Community Survey (ACS) 5-Year Estimates.
- Population is coded by table B03002, field B03002001.
- Low-income status is set at 150% of the US federal poverty level. This is coded by the appropriate fields in table C17002.
- Minority status is coded by table B03002, by subtracting the white, non-Hispanic population (B03002003) from the total population (B03002001).
- Service area is a set of block groups determined by a shapefile your agency provides.

⁴ <https://help.remix.com/en/articles/1439215-remix-101-using-the-remix-title-vi-engine>

Methodology

1. Get the population near a route, including its low-income and minority percentage.
 - For each route, build a shape that represents the area within quarter-mile of any of its stops.
 - Intersect the catchment area with 2018-2022 ACS 5-year estimates. Get a list of block groups and the percentage overlap with each.
 - For each block group, take the percentage of overlap and multiply it by the block group's statistics.
 - Get the population, minority population, and low-income population for each group and sum them together. This is the total population a route could serve.
 2. Compare the number of people-trips, before and after.
 - Multiply the population near a route by the number of trips it makes (per year) to get "people-trips".
 - Repeat for low-income and minority populations to get "low-income people-trips" and "minority people trips".
 - Compare these numbers between the before and after versions of the route, to get a set of people-trip differences. We match before and after using routes that have the same name.
 3. Get the total difference in people-trips across the transit system.
 - Repeat the process above for every route in the transit system.
 - Sum together the difference in people trips. This will return three numbers: total difference in people-trips, total difference in low-income people-trips, and total difference in minority people trips.
 4. Calculate the change borne by low-income and minority populations.
 - Divide the total difference in low-income people trips by the total difference in people-trips to get the percentage of change borne by those with low incomes.
 - Repeat for minority people-trips.
 5. Compare the percentage change to the average in the service area.
 - Calculate the average percentage of low-income and minority populations across the entire service area.
 - Subtract from the change borne by those populations.
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- Get two final numbers: the delta between the impact this set of transit changes had on low-income and minority populations compared to any average change.

5.2 – Quantitative Analysis Results

The results of the quantitative analysis indicate that Metro’s service adjustments since the implementation of the Transit Network Redesign have not resulted in Disparate Impacts or Disproportionate Burdens. Since June 2023, Metro’s service changes have resulted in an estimated increase of 1.3 billion people-trips. Minority and low-income populations saw an increase in service as a result of these changes. More details on these findings are discussed in the following sections.

5.2.1 – Disproportionate Burden Analysis

Approximately 650 million (49.3%) of the 1.3 billion people-trips added since June 2023 are considered low-income (Table 1). Within Metro's service area, this demographic accounts for about 18%, as detailed in Figures 10-13. Evidence of a potential Disproportionate Burden is found if there are adverse effects imposed by the service change, and the difference in people-trips for low-income populations and the area average for low-income people is greater than 2%. The increase in low-income people-trips exceeds the area average by 31 percentage points, indicating that low-income populations benefit from these service additions. Since the service changes have not imposed any adverse effects, there is no evidence of a potential Disproportionate Burden on low-income populations.

Table 1 - Disproportionate Burden Analysis

Change in People Trips	Low-Income People Trips	Percent of Total	Area Average	Delta	Disproportionate Burden
1,322,732,990	651,772,926	49.3%	18%	31.3%	No

Figure 10 – Proportion of Low-Income Population (Metro Service Area)

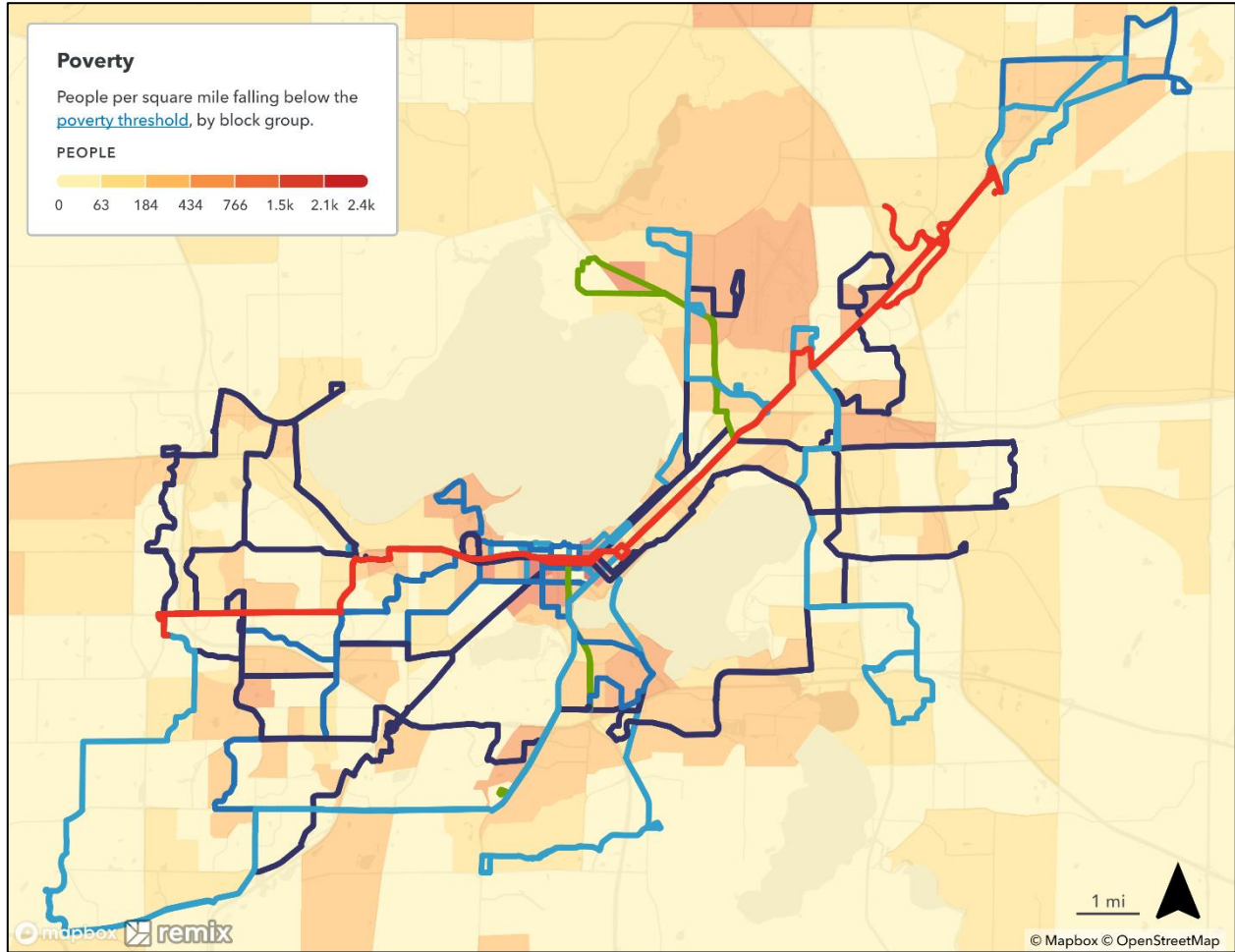


Figure 11 – Percent of Low-Income Population (Service Change Overlay)

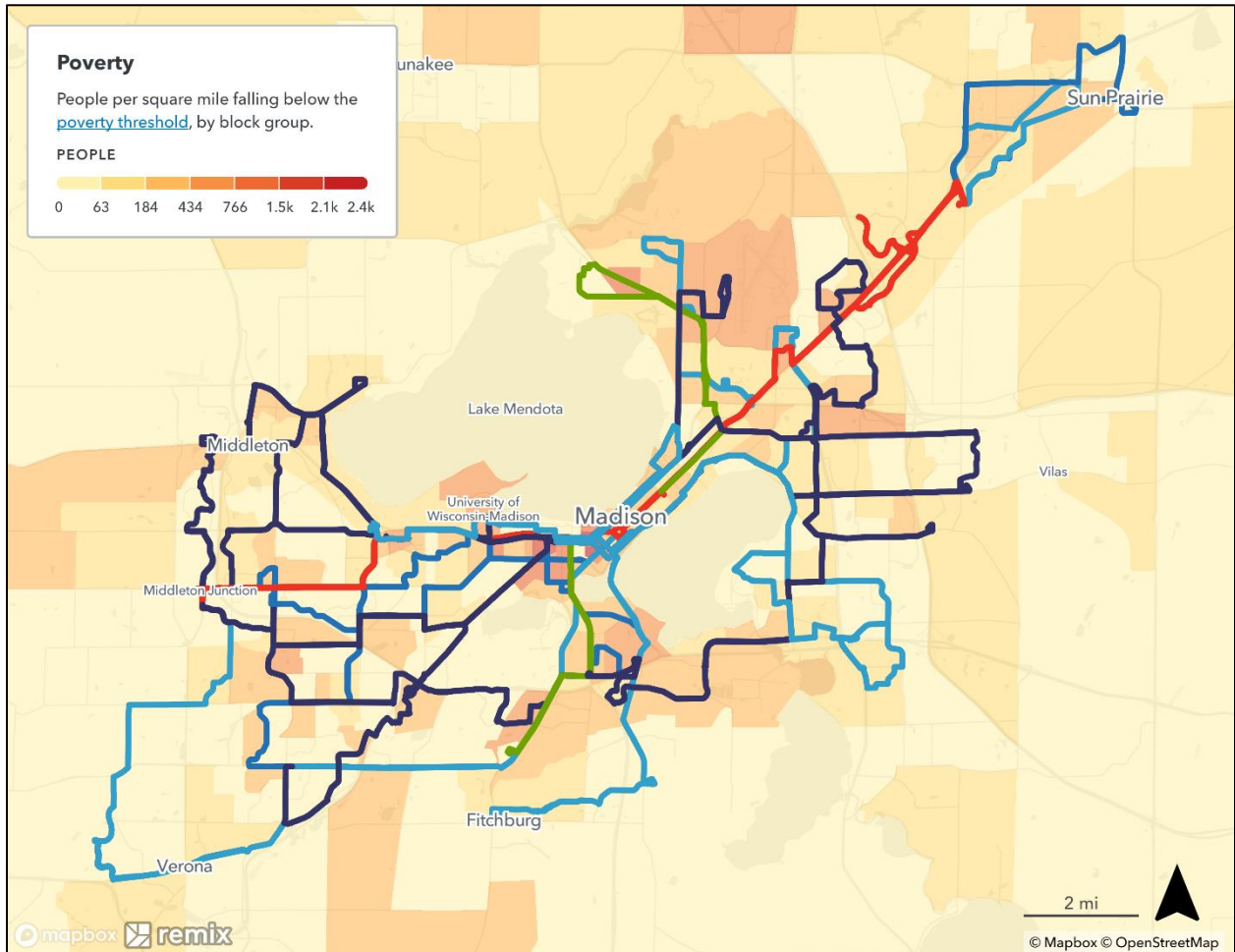


Figure 12 - Proportion of Low-Income Population (Downtown Madison)

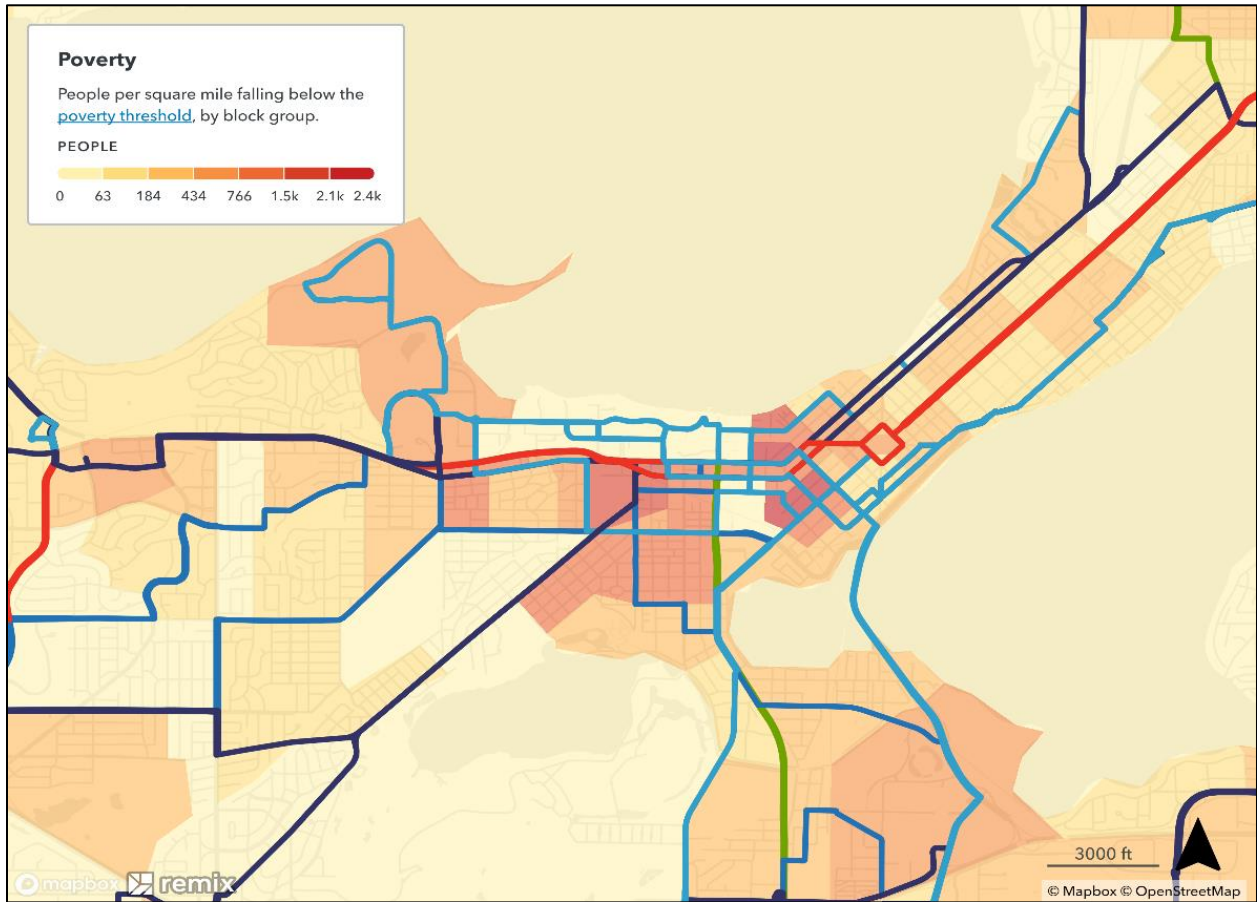
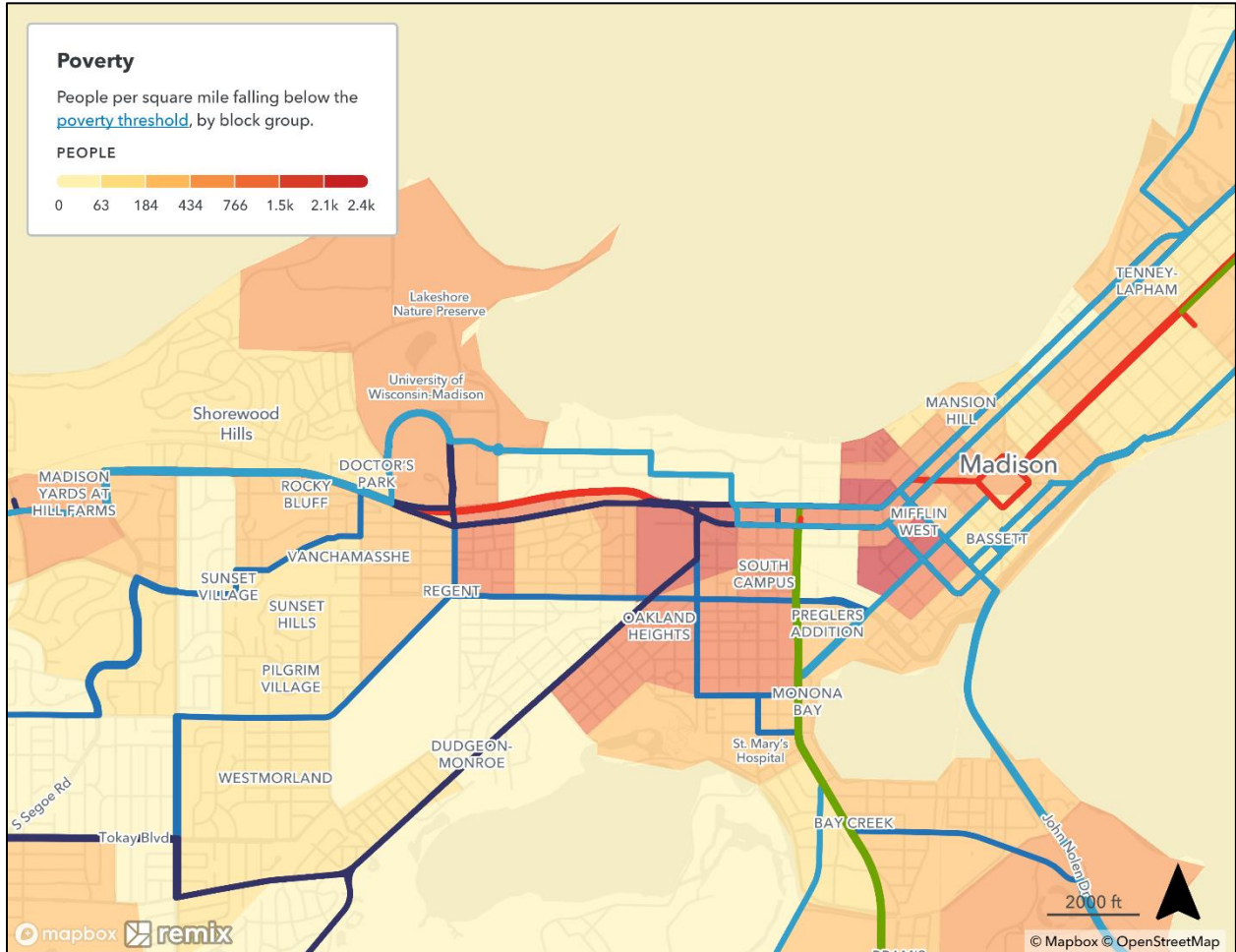


Figure 13 - Proportion of Low-Income Population (Service Change Overlay)



5.2.2 – Disparate Impact Analysis

Approximately 325 million (24.6%) of the 1.3 billion people-trips added since June 2023 are considered minority people-trips (Table 2). Within Metro's service area, this demographic accounts for 26.2% of the population, as detailed in Figures 14-17. Evidence of a potential Disparate Impact is found if there are adverse effects imposed by the service change, and the difference in people-trips for minority populations and the area average for minority populations is greater than 2%. The increase in low-income people-trips is 1.63 percentage points lower than the area average, indicating that the proportion of benefits that accrue to minority populations from these service additions is slightly less than the area average. However, this is within Metro's policy threshold of 2%, and is therefore not considered evidence of a potential Disparate Impact.

Table 2 – Disparate Impact Analysis

Change in People Trips	Low-Income People Trips	Percent of Total	Area Average	Delta	Disparate Impact
1,322,732,990	325,016,925	24.6%	26.2%	-1.63%	No

Figure 14 – Proportion of Minority Populations (Metro Service Area)

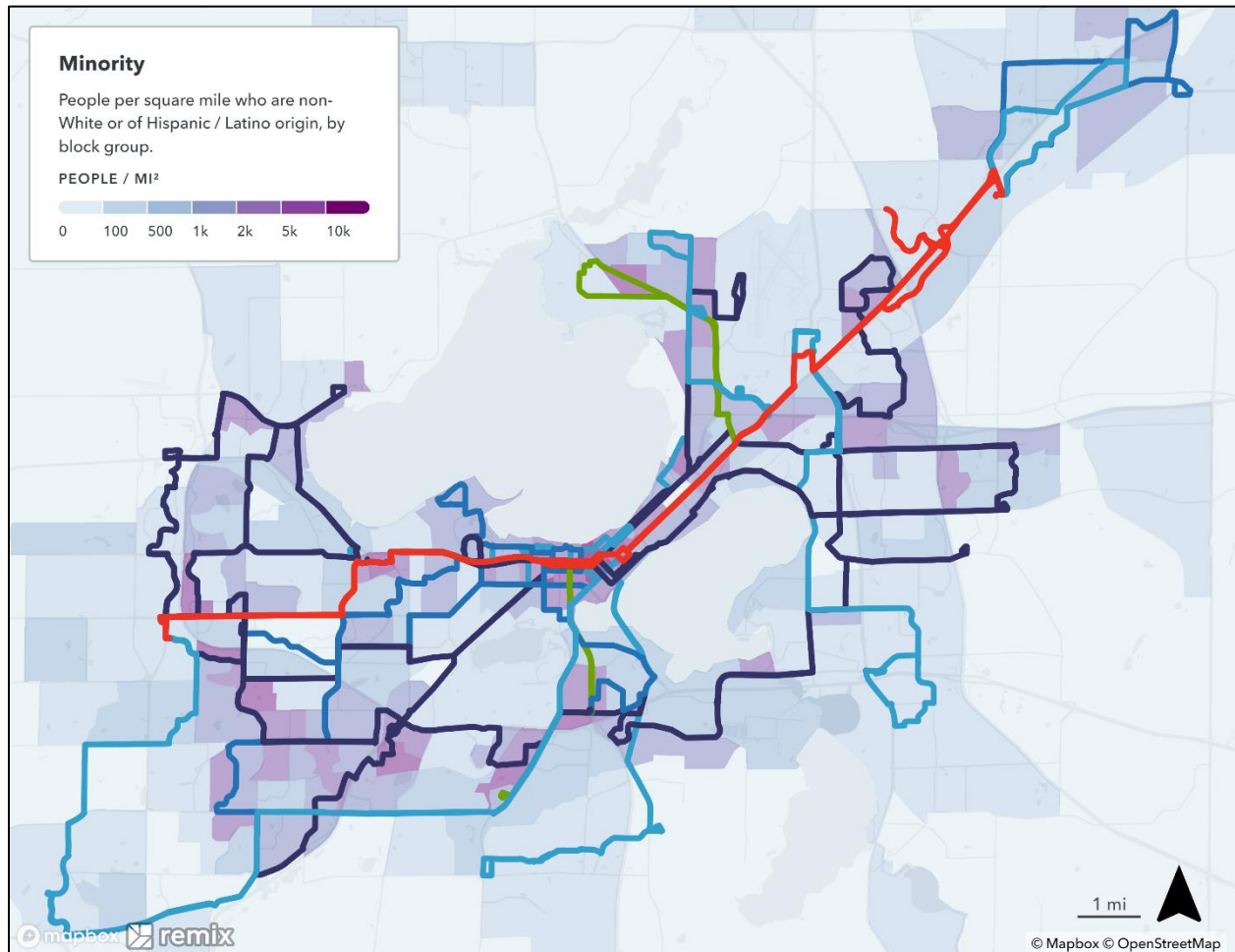


Figure 15 – Proportion of Minority Populations (Service Change Overlay)

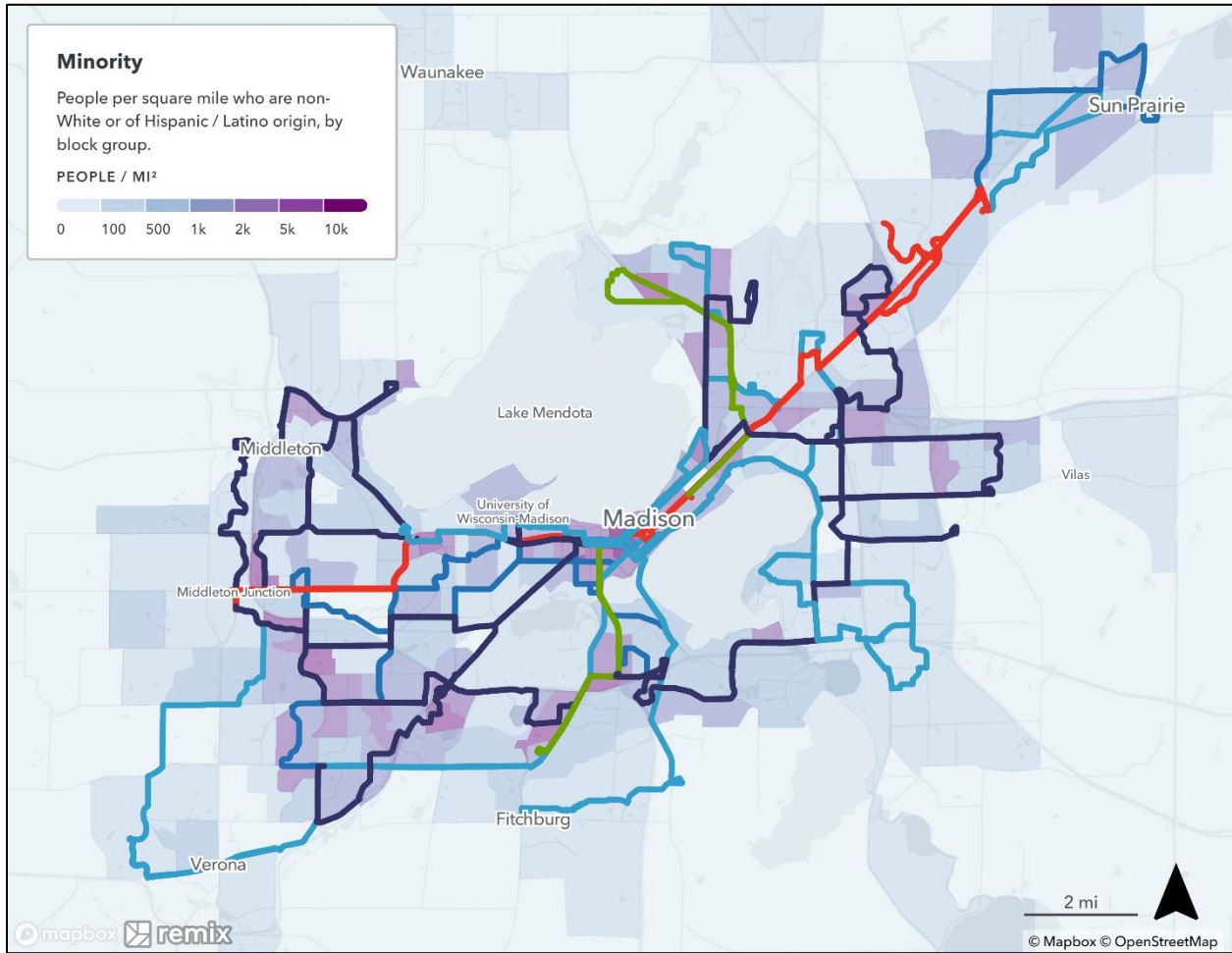


Figure 16 – Proportion of Minority Populations (Downtown Madison)

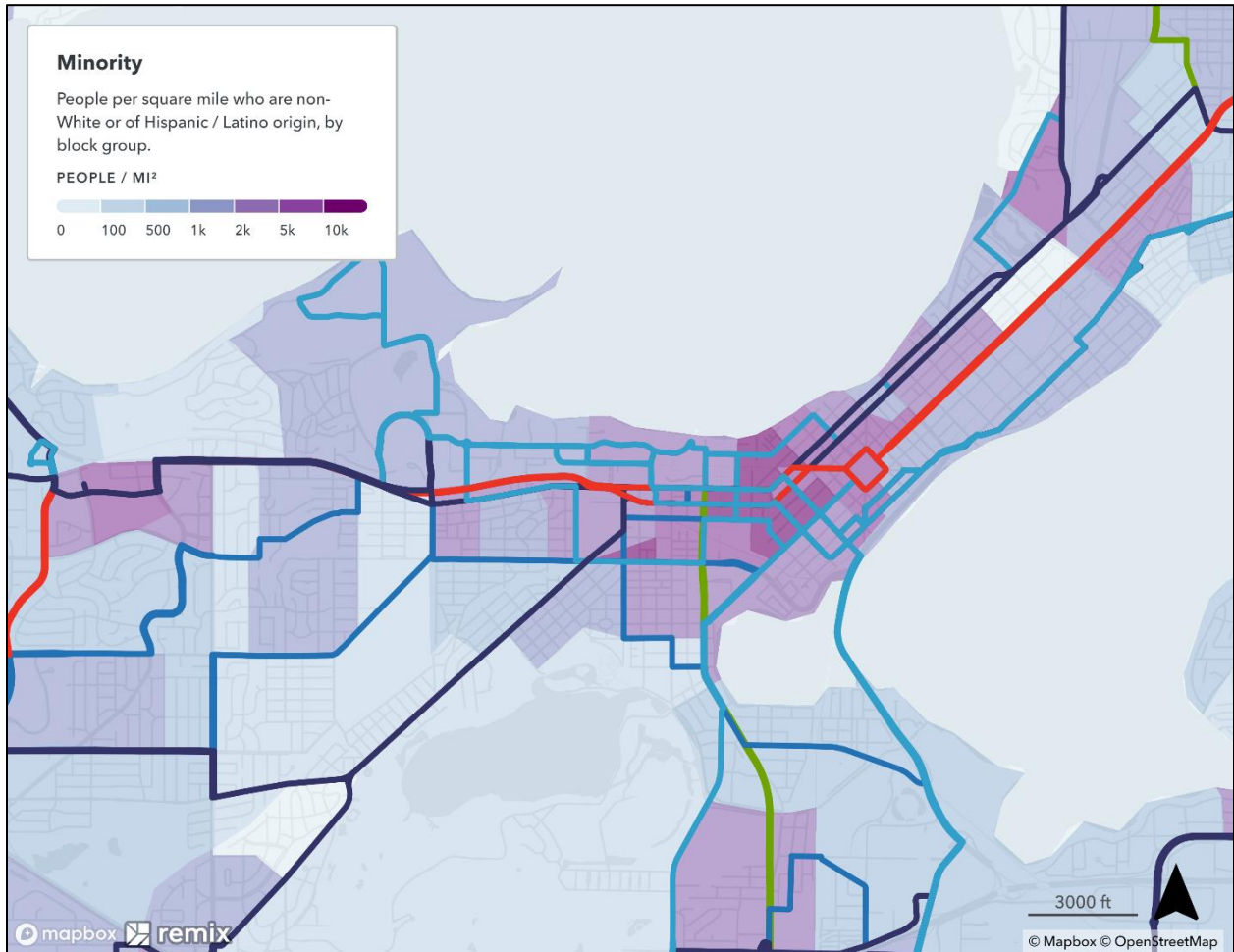


Figure 17 - Proportion of Minority Populations (Service Change Overlay)

