Appendix G Scenario Evaluation Results Memo

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MEMORANDUM

To: **The Met Council**

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Subject: The Met Council Bus Service Allocation Study – Scenario Evaluation Results

Introduction

The Met Council is conducting a Service Allocation Study. The goals of the study include:

- Facilitate regional discussion with policy makers on transit priorities,
- Understand region-wide need for better mobility options,
- Develop and evaluate a series of expansion scenarios that reflect regional goals, and
- Document regional values to inform future service investment.

The purpose of this memo is to outline the results of the evaluation of the two 2040 expansion scenarios that were developed to illustrate the potential outcomes of differing investment strategies. The evaluation criteria were designed to measure how well each network addresses potential needs of the region. The criteria were informed by feedback from Met Council staff, area transit providers, regional policymakers, key stakeholders, and national experience.

Scenario Summary

Scenario descriptions were developed in coordination with feedback from regional policymakers. Each scenario strives to achieve a different goal and are intended to be different than one another. The networks, however, are not mutually exclusive. Some improvements are included in both because they serve the intent of both scenarios. Initial scenario networks were presented to the regional transit providers in August 2020. Their feedback was an important step in the development of the scenario networks.

To evaluate and compare the respective benefits of the two expansion scenarios, a consistent base network was developed to reflect a starting point for a 2040 network. The base network was comprised of pre-COVID March 2020 networks for all regional service providers and the Met Council funded transitways as outlined in the 2040 Transportation Policy Plan (TPP). Both scenarios were developed under the assumption that there would be sufficient regional transit funding to support a 25% increase in bus service by 2040, not including the funding allotted for the funded transitways. The development of the two scenarios acknowledged the Transit Market Area design guidelines outlined in the Met Council's 2040 Transportation Policy Plan (TPP), which divides the region into five distinct areas representing different levels of potential transit demand. While the TPP outlines the type of services each market area can potentially support, this analysis assumes future changes and growth within each market area that could support higher levels of service by 2040.

Scenario 1: Invest additional resources in improving transit that serves all trip types

The goal of this scenario is to expand the range of communities where it is possible to live without a car. The focus will be on increasing the amount of service that is convenient and can be depended on for all trip types—high-frequency, all-day, all-week service. This scenario prioritizes expanding service to areas of highest transit use potential and maximizing ridership. Service distribution will use an equity lens to distribute expanded services to communities of color and low-income populations.

The process for choosing existing bus routes and future expansion routes to receive increased service involved 1) selecting the most productive bus routes in the existing network, 2) selecting routes that serve the areas of highest transit potential, communities of color, and areas of concentrated poverty, and 3) upgrade existing routes and extend service to provide frequent connections to funded transitways.

As a result, Scenario 1 proposed expansion of the high-frequency transit network to many areas that currently have local service and local transit connections to planned transitways. No basic or commuter & express service was added in this scenario.

Scenario 2: Invest additional resources in increasing regional access to transit

The goal of this scenario is to strengthen connections to suburban jobs and opportunities throughout the fixed-route transit service area. The scenario prioritizes suburb-to-suburb transit access, reverse-commute services, and job access for suburban residents. Expanding service to areas of highest transit use potential will be a secondary priority.

The process for choosing existing bus routes and future expansion routes to receive increased service involved 1) identifying expansion priorities identified by transit providers, 2) identifying most productive basic transit routes, 3) identifying reverse commute and suburb-to-suburb connections, 4) expanding connecting bus service with planned transitways, and 5) expanding coverage services.

As a result, Scenario 2 proposed the expansion of the local transit network to many areas that currently have basic service or no service at all, local transit connections to planned transitways, some expansion of commuter & express service, and an expansion of demand response and alternative services. No basic service was added in this scenario.

Evaluation Methodology

To evaluate how well each of the two scenario networks address the potential needs of the region, the measures were calculated under the following categories:

- **Access to Transit**
    - *Improved Transit Service:* population and employment served by improved service
    - *Change in Access to Transit by Service Level:* population and employment with an upgraded level of service (i.e. local to high frequency) or new transit service as compared to the base network. The levels of service included in this analysis are[1]:
        - High-frequency transit: 15-minute or better frequencies throughout most of the day on weekdays and Saturdays
        - Local transit: 30-minute or better frequencies throughout the day on weekdays
        - Basic transit: corridors and flex services with more than 30-minute frequencies throughout the day. *Note: No basic service routes were added to either scenario.*
        - Commuter & express service: peak-only service into the two central business districts, peak-only reverse commute service that targets suburban employers, all-day service with long, non-stop segments.
    - *Access to New All-Day Transit:* population and employment with access to new all-day transit service compared to the base network
- **Network Access to Employment:** the percent change of jobs the average regional resident has access to within a 45-minute trip on the transit network in each scenario compared to the base network
- **Ridership Potential:** an estimate of the relative impact each scenario would have on increasing the number of regional trips taken on transit

Access to Transit

For the three Access to Transit measures, the following population and employment groups were broken out in the analysis to measure how many people are jobs benefit from the two scenarios:

- **Population**
    - *Total population*
    - *Black, indigenous, and people of color (BIPOC)*
    - *Low-income population* (individuals with an individual or family income below 185% of the federal poverty threshold)

[1] On-demand type services provide mobility to people in areas and between origin-destination pairs that do not have sufficient demand to support fixed-route transit, as well as first/last mile service. While Scenario 2 includes additional funding for demand response and alternative services, this service type is not included fully in the scenario evaluation. Currently, the entire region has access to some form of on-demand services through Metro Mobility, so would not be reflect in any increase from the scenarios. The service family is included in the Improved Access to Transit evaluation.

  - *Affordable housing units* (housing units for households with an income below 30% of the Area Median Income)
  - *Population without auto access* (individuals aged 16 or older without access to an automobile)
  - *Older population* (individuals aged 65 or older)

- **Employment**
  - *Total employment*
  - *Low-wage employment* (jobs earning less than $40,000 per year)
  - *High-wage employment* (jobs earning more than $40,000 per year)

Demographic and socio-economic data was pulled from data provided by the Met Council, the 2018 American Community Survey (ACS) 5-Year Estimates, and 2017 Longitudinal Employer-Household Dynamics (LEHD) employment data.

Improved Transit Service

This measure calculates how many people and jobs benefit from the improved and expanded transit service in both scenarios, whether they live or work in an area that has increased service or live or work in an area that did not have service before. This measure includes any person or job with added service, regardless of the type of improvement. As an example, someone who currently has access to 15-minute high-frequency service and would now have access to 10-minute high-frequency service in a scenario would be counted under this metric.

To calculate the benefit, each scenario's network alignments and corresponding bus stops were exported from Remix transit planning software into ArcGIS software. Ten-minute (800m or approximately ½ mile) walksheds were calculated for each transit stop along segments of routes that would receive increased or expanded fixed-route service for each scenario[2]. For Scenario 2, the additional area of improved and expanded demand response & alternative services service area was also calculated.

Each walkshed was intersected with the Twin Cities 7-county regional census tract boundaries to determine the proportion of the population that was within a reasonable walking distance of the improved or expanded service. For the purposes of this analysis, the population of each census tract was assumed to be evenly distributed throughout the area of the census tract. Water bodies were excluded from the area calculation of the census tracts. The proportion of area within the walkshed was applied to the total of population or employment variable to calculate the proportion served. The totals of each population and employment group were compared to the regional totals of the population and employment groups to measure the proportion of regional people and jobs that would experience improved or expanded transit service.

[2] Ten minutes was selected as a reasonable walking distance an individual would travel to reach transit based on national research. Five-minute (400m) walksheds were also calculated to test the sensitivity of the walkshed distance on the results of the evaluation. The results of two walkshed analyses did not result in any drastically different results. For the Improved Transit Service metric, the regional percentage of people and jobs with improved access to transit increased between 1.3 and 1.8 times when the walkshed was expanded from 400m to 800m for both scenarios.

To analyze the spatial distribution of the benefit across the region, the walksheds were intersected with the Transit Market Areas. The number of people and jobs with improved or expanded transit were calculated, as well as the percentage of the scenario total for each group.

Change in Access to Transit by Service Level

As a way to quantify the access to improvements by service frequency, this measure focuses on the number of people at each level of service that have received an upgraded level of service or access to new transit service for each scenario. In other words, a person who currently lives within walking distance of "basic transit" route that is upgraded to "local transit" in Scenario 1 is counted, along with someone who does not have access to any "local transit" now and is within walking distance of a new "local transit" route in Scenario 1. People and jobs that currently have access to the "high-frequency" transit network and receive additional frequencies in Scenario 1 are not counted in this measure because their service level has not been upgraded (their level of service is "high-frequency transit" in both the base and in the scenario).

To calculate the change in access to transit by service level, walksheds were created for stops served by each level of service (high-frequency transit, local transit, basic transit, and commuter & express transit[3]) as prescribed in each scenario network. This collection of walksheds was developed for the base, or existing service network with funded transitways, Scenario 1, and Scenario 2. The same process was used to calculate the intersection of the population and employment groups within the base and each scenario's service level walksheds as was used for the Improved Transit Service measure. The population and employment groups that have access to the various service levels were summed to determine the percentage and net increase for the two scenarios. For total population and employment, the change in access to transit was also broken up by Transit Market Area by intersecting the walksheds in GIS with the five Transit Market Areas and summing the population and employment numbers within each.

Access to New All-Day Transit

This measure calculates the percentage and number of people and jobs with access to new all-day transit service, or service that runs with regular frequency on weekdays. This classification encompasses high-frequency, local, and basic transit services. Unlike the Improved Transit Service or Change in Access to Transit by Service Level measures, this measure only captures the number of people and jobs that are provided with access to all-day transit in each scenario that do not have access to all-day transit in the base network.

The values were calculated using a similar process as the other access measures, with scenario walksheds developed for stops served by routes that fall within the high-frequency, local, and basic transit networks. The intersection of the population and employment groups within the base and each scenario's service level walksheds was calculated and summed to determine the percentage and net increase for the two scenarios. For total population and employment, new access to all-day transit was also broken up by Transit Market Area by intersecting the walksheds in GIS with the five Transit Market Areas and summing the people and jobs within each.

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

Network Access to Employment

This measure looks at the potential for interaction between people and destinations in different locations. The accessibility metric employed in this analysis is the number of jobs that can be reached by transit within various travel durations, for departures in the 7–9 AM period.

More information about the methodology of the network access to employment measure can be found in the *Accessibility Impacts of Bus Service Allocation Study Memo* from the Accessibility Observatory at the University of Minnesota.

Ridership Potential

A high-level quantitative analysis of ridership impacts of each scenario was conducted. The intent was to be able to understand the market response to different investment strategies.

The high-level analysis was based on 2018 annual ridership provided by the Met Council and the estimated increases in the number of revenue hours by route from Remix mapping software. A methodology for estimating ridership for existing routes and for new routes was developed.

To estimate potential ridership responses for existing routes, a ridership elasticity was applied to the existing ridership and increased hours of each enhanced route. The elasticity varied depending on the level of frequency improvement. The elasticities are based on national experience, where elasticities are higher for infrequent routes and become smaller as the base route frequency decreases.

For new routes, the estimated ridership response was based on the productivity of routes with similar operating characteristics. The baseline productivity was the average 2018 figures for local, basic, and flexible services. Because these routes are new, it is highly likely that the average productivity of the new routes would be less than the regional average. Thus, they were factored down to reflect 80% of the average productivity. The factored down average productivities were then applied to the average new hours for each route.

Results

Access to Transit

Improved Transit Service

The scenario values in Figure 1 represent the percentage of the Twin Cities regional total of each population and employment group with increased service (both improvements to existing service and expanded service) and the number of people and jobs with improved service.

Scenario 1 improves fixed-route access to population and employment more than Scenario 2. In Scenario 1, over one-third of the region's population and over half of the region's employment experience improved or expanded transit service. In Scenario 2, just over one-quarter of the region's population and less than half of the region's employment are exposed to improved fixed route transit service. Including the expanded demand response zones, Scenario 2 provides about one third of the region's population and over on-half the region's employment with improved transit service. Notably, Scenario 1 improves transit service for over half of the region's low-income and BIPOC population, while Scenario 2 improves transit service for about one-third of the region's low-income and BIPOC population. The full results for improved transit service for both scenarios can be seen in Figure 1.

Total population and employment with improved transit within each of the region's Transit Market Areas for each scenario is shown in Figure 2. In Scenario 1, most of the regional improved access for population and employment occurs in Market Areas 1 and 2. Scenario 2, which focused on improvements in the more suburban areas of the region, has a greater influence on the population and employment in Market Areas 2 and 3.

Figure 1 Population and employment with improved transit service (additional service frequency or expanded service)

Improved access for…	Regional Total	Scenario 1 (% of regional total)	Scenario 2 (% of regional total)	Scenario 2 with DR* (% of regional total)
Population				
Total population	3,013,000 people	+37% (1,104,000 people)	+27% (819,000 people)	+36% (1,093,000 people)
BIPOC	792,000 people	+54% (431,000 people)	+34% (267,000 people)	+40% (319,000 people)
Low-income people	624,000 people	+55% (343,000 people)	+31% (195,000 people)	+36% (227,000 people)
Affordable housing units	714,000 units	+47% (334,000 units)	+34% (240,000 units)	+40% (283,000 units)
People without auto access	50,000 people	+70% (35,000 people)	+34% (17,000 people)	+37% (19,000 people)
Older people	399,000 people	+33% (133,000 people)	+29% (117,000 people)	+38% (151,000 people)
Employment				
Total employment	1,763,000 jobs	+51% (893,000 jobs)	+44% (770,000 jobs)	+51% (907,000 jobs)
Low-wage employment	822,000 jobs	+49% (400,000 jobs)	+40% (330,000 jobs)	+48% (391,000 jobs)
High-wage employment	941,000 jobs	+52% (494,000 jobs)	+47% (440,000 jobs)	+55% (517,000 jobs)

*This column includes improvements to both fixed-route bus service, demand response, and alternative service.

Note: Due to rounding, there may be slight inconsistencies between the values and percentages.

Figure 2 Population and employment with improved transit service by Transit Market Area

Improved access within…	Scenario 1 (% of regional scenario total)	Scenario 2 (% of regional scenario total)	Scenario 2 with DR* (% of regional scenario total)
Regional Scenario Total			
Population	1,104,000 people	819,000 people	1,093,000 people
Employment	893,000 jobs	770,000 jobs	907,000 jobs
Market Area 1			
Population	34% (371,000 people)	11% (93,000 people)	9% (93,000 people)
Employment	49% (436,000 jobs)	29% (221,000 jobs)	24% (221,000 jobs)
Market Area 2			
Population	43% (480,000 people)	31% (252,000 people)	21% (227,000 people)
Employment	26% (231,000 jobs)	21% (158,000 jobs)	15% (135,000 jobs)
Market Area 3			
Population	21% (234,000 people)	54% (442,000 people)	55% (597,000 people)
Employment	23% (205,000 jobs)	46% (351,000 jobs)	51% (466,000 jobs)
Market Area 4			
Population	2% (19,000 people)	4% (32,000 people)	16% (170,000 people)
Employment	2% (22,000 jobs)	5% (40,000 jobs)	9% (83,000 jobs)
Market Area 5			
Population	0% (0 people)	<1% (<1,000 people)	<1% (6,000 people)
Employment	0% (0 jobs)	<1% (<1,000 jobs)	<1% (2,000 jobs)

*This column includes improvements to both fixed-route bus service, demand response, and alternative services.

Note: Due to rounding, there may be slight inconsistencies between the values and percentages.

Change in Access to Transit by Service Level

The two scenarios were designed to focus service improvements to different levels of service and to different parts of the region. This measure looks at how many more people and jobs have access to the four levels of fixed-route transit. The scenario values show the percentage and number of people and jobs served by upgraded and expanded service for each service level over the base scenario. It should be noted that there was no basic transit service added to either scenario, so the tables below show no change in access for basic service. The total value represents the total number of people or jobs with new access to upgraded or expanded transit. *This total does not reflect the total number of people receiving an increase in service by scenario. Those values can be seen in the Improved Transit Service measure.*

Total population served

Scenario 1 reaches more of the population with upgraded or expanded service than Scenario 2. Scenario 1, which upgraded many local transit routes in the Twin Cities to high frequency service, significantly expands access to the high frequency transit network to 78% more people than it does in the base. Additionally, 18% more people have access to local transit. Together, 30%, or over 600,000 people, more people have upgraded or new access in Scenario 1 over the base.

Scenario 2 focused on expanding the local service network to the suburban areas of the region and, as a result, provides local transit service for 66% more people than the base. Scenario 2 benefits about 20% more people with upgraded or new access over the base. The full results for population served can be seen in Figure 3.

Figure 4 breaks down the increase in access to transit for each of the region's 5 Transit Market Areas. Scenario 1 significantly improves the population's access to high frequency and local transit in Market Areas 2 and 3. Scenario 2 has little effect on Market Areas 1 and 2, but nearly doubles access to local transit in Market Area 3.

Figure 3 Population with access to a route that has an upgraded service level or to a new route by service type

Population with access to…	Base	Scenario 1	Scenario 2
High-Frequency	645,000 people	+78% (504,000 people)	+0% (0 people)
Local	610,000 people	+18% (112,000 people)	+66% (403,000 people)
Basic	338,000 people	+0% (0 people)	+0% (0 people)
Commuter & Express	426,000 people	+0% (0 people)	+<1% (<1,000 people)
Total*	2,019,000 people	+30% (615,000 people)	+20% (404,000 people)

* This total does not reflect the total number of people receiving an increase in service by scenario. Those values can be seen in the Improved Transit Service measure.

Note: Due to rounding, there may be slight inconsistencies between the values and percentages.

Figure 4 **Population with access to a route that has an upgraded service level or to a new route by service type within each Transit Market Area**

Population with access to…	Base	Scenario 1	Scenario 2
Market Area 1			
High-Frequency	309,000 people	+21% (64,000 people)	+0% (0 people)
Local	374,000 people	+0% (0 people)	+0% (0 people)
Basic	267,000 people	+0% (0 people)	+0% (0 people)
Commuter & Express	267,000 people	+0% (0 people)	+0% (0 people)
Market Area 2			
High-Frequency	265,000 people	+94% (251,000 people)	+0% (0 people)
Local	540,000 people	+3% (16,000 people)	+7% (39,000 people)
Basic	516,000 people	+0% (0 people)	+0% (0 people)
Commuter & Express	406,000 people	+0% (0 people)	+0% (0 people)
Market Area 3			
High-Frequency	70,000 people	+267% (187,000 people)	+0% (0 people)
Local	281,000 people	+31% (87,000 people)	+135% (378,000 people)
Basic	257,000 people	+0% (0 people)	+0% (0 people)
Commuter & Express	769,000 people	+0% (0 people)	+0% (0 people)
Market Area 4			
High-Frequency	0 people	+2,073% (3,000 people)	+0% (0 people)
Local	5,000 people	+374% (19,000 people)	+591% (30,000 people)
Basic	4,000 people	+0% (0 people)	+0% (0 people)
Commuter & Express	141,000 people	+0% (0 people)	+1% (1,000 people)
Market Area 5			
High-Frequency	0 people	+N/A (131 jobs)	+0% (0 people)
Local	0 people	+0% (0 people)	+333% (<1,000 people)
Basic	0 people	+0% (0 people)	+0% (0 people)
Commuter & Express	9,000 people	+0% (0 people)	+0% (0 people)

Note: Due to rounding, there may be slight inconsistencies between the values and percentages.

Black, indigenous, and people of color (BIPOC) served

Scenario 1 benefits more BIPOC with upgraded or expanded transit than Scenario 2. Scenario 1 expands the high frequency transit network to 64% more BIPOC, which together with the increase in the local service, results in a 32% increase in access to upgraded or expanded transit. Scenario 2 provides local transit service for 53% more BIPOC, which together with the small improvement to commuter and express access, results in a 16% increase in access to upgraded or expanded transit. The full results for BIPOC served can be seen in Figure 5.

Figure 5 BIPOC with access to a route that has an upgraded service level or to a new route by service type

Population with access to…	Base	Scenario 1	Scenario 2
High-Frequency	274,000 people	+64% (176,000 people)	+0% (0 people)
Local	198,000 people	+17% (34,000 people)	+53% (105,000 people)
Basic	99,000 people	+0% (0 people)	+0% (0 people)
Commuter & Express	81,000 people	+0% (0 people)	+<1% (<1,000 people)
Total*	652,000 people	+32% (210,000 people)	+16% (105,000 people)

* This total does not reflect the total number of people receiving an increase in service by scenario. Those values can be seen in the Improved Transit Service measure.

Note: Due to rounding, there may be slight inconsistencies between the values and percentages.

Low-income population served

Scenario 1 benefits more people with upgraded or expanded service than Scenario 2. Scenario 1 expands the high frequency transit network to 65% more low-income people. Between the improvements to high frequency and local networks, Scenario 1 benefits 32% more low-income people. Scenario 2 provides about half of the number of low-income people with additional access to local transit service, resulting in a total Scenario benefit of about 14% more low-income people served by upgraded or expanded transit. The full results for low-income population served can be seen in Figure 6.

Figure 6 Low-income population with access to a route that has an upgraded service level or to a new route by service type

Population with access to…	Base	Scenario 1	Scenario 2
High-Frequency	222,000 people	+65% (143,000 people)	+0% (0 people)
Local	161,000 people	+12% (19,000 people)	+45% (73,000 people)
Basic	68,000 people	+0% (0 people)	+0% (0 people)
Commuter & Express	59,000 people	+0% (0 people)	+<1% (<1,000 people)
Total*	509,000 people	+32% (162,000 people)	+14% (73,000 people)

* This total does not reflect the total number of people receiving an increase in service by scenario. Those values can be seen in the Improved Transit Service measure.

Note: Due to rounding, there may be slight inconsistencies between the values and percentages.

Affordable housing units served

Scenario 1 provides a larger increase of upgraded or expanded transit access to the region's affordable housing units than Scenario 2. Scenario 1 expands the high frequency transit network to 73% more affordable housing units. In total, the scenario benefits 31% more affordable housing units over the base. Scenario 2 provides local transit service for 58% more affordable housing units, which results in a total benefit to 18% more people over the base. The full results for affordable housing units served can be seen in Figure 7.

Figure 7 Affordable housing units with access to a route that has an upgraded service level or to a new route by service type

Units with access to…	Base	Scenario 1	Scenario 2
High-Frequency	208,000 units	+73% (151,000 units)	+0% (0 units)
Local	176,000 units	+14% (24,000 units)	+58% (102,000 units)
Basic	91,000 units	+0% (0 units)	+0% (0 units)
Commuter & Express	86,000 units	+0% (0 units)	+<1% (<1,000 units)
Total*	561,000 people	+31% (175,000 units)	+18% (102,000 units)

* This total does not reflect the total number of units receiving an increase in service by scenario. Those values can be seen in the Improved Transit Service measure.

Note: Due to rounding, there may be slight inconsistencies between the values and percentages.

Population without auto access served

This measure represents a relatively small proportion of the regional population. Overall, Scenario 1 better serves this population with a 39% increase in access to high quality, high-frequency service, which makes up a large portion of the 26% systemwide increase in access to upgraded or expanded service. Scenario 2's improvements benefits 36% more people with access to local transit, which only results in a systemwide benefit of 9% more people. The full results for population without auto access served can be seen in Figure 8.

Figure 8 Population without auto access with access to a route that has an upgraded service level or to a new route by service type

Population with access to…	Base	Scenario 1	Scenario 2
High-Frequency	27,000 people	+39% (10,000 people)	+0% (0 people)
Local	12,000 people	+10% (1,000 people)	+36% (4,000 people)
Basic	4,000 people	+0% (0 people)	+0% (0 people)
Commuter & Express	3,000 people	+0% (0 people)	+<1% (<1,000 people)
Total*	45,000 people	+26% (11,000 people)	+9% (4,000 people)

* This total does not reflect the total number of people receiving an increase in service by scenario. Those values can be seen in the Improved Transit Service measure.

Note: Due to rounding, there may be slight inconsistencies between the values and percentages.

Older population served

Scenario 1 outperforms Scenario 2 in providing upgraded or expanded service. Scenario 1 expands the high frequency transit network to 91% more older people and the local network to 20% more older people, which results in a total scenario benefit of 30% increase. While, Scenario 2 provides local transit service for 71% more older people, it only results in a 22% increase in access to upgraded or expanded service. The full results for older population served can be seen in Figure 9.

Figure 9 Older population with access to a route that has an upgraded service level or to a new route by service type

Population with access to…	Base	Scenario 1	Scenario 2
High-Frequency	72,000 people	+91% (66,000 people)	+0% (0 people)
Local	85,000 people	+20% (17,000 people)	+71% (61,000 people)
Basic	49,000 people	+0% (0 people)	+0% (0 people)
Commuter & Express	66,000 people	+0% (0 people)	+<1% (<1,000 people)
Total*	273,000 people	+30% (83,000 people)	+22% (61,000 people)

* This total does not reflect the total number of people receiving an increase in service by scenario. Those values can be seen in the Improved Transit Service measure.

Note: Due to rounding, there may be slight inconsistencies between the values and percentages.

Total employment served

Both scenarios benefit a similar number of jobs with upgraded or expanded service, with Scenario 1 benefiting 26% more jobs and Scenario 2 benefiting 21% more jobs over the base. Scenario 1 expands higher quality, high frequency transit to 43% more jobs, as well as local transit service to 33% additional jobs. Meanwhile, Scenario 2 provides 91% more jobs with local transit service with no improvements to the high frequency network. The full results for employment served can be seen in Figure 10.

Figure 11 breaks down the increase in employment access to transit for each of the region's 5 Transit Market Areas. The majority of the change and expansion of high frequency transit employment access occurs in Market Area 2 and 3. Scenario 2 has a large impact on the employment access to local transit in Market Area 3.

Figure 10 Employment with access to a route that has an upgraded service level or to a new route by service type

Employment with access to…	Base	Scenario 1	Scenario 2
High-Frequency	617,000 jobs	+43% (263,000 jobs)	+0% (0 jobs)
Local	329,000 jobs	+33% (107,000 jobs)	+91% (299,000 jobs)
Basic	211,000 jobs	+0% (0 jobs)	+0% (0 jobs)
Commuter & Express	245,000 jobs	+0% (0 jobs)	+<1% (<1,000 jobs)
Total*	1,402,000 jobs	+26% (370,000 jobs)	+21% (299,000 jobs)

* This total does not reflect the total number of jobs receiving an increase in service by scenario. Those values can be seen in the Improved Transit Service measure.

Note: Due to rounding, there may be slight inconsistencies between the values and percentages.

Figure 11 Employment with access to a route that has an upgraded service level or to a new route by service type within each Transit Market Area

Employment with access to…	Base	Scenario 1	Scenario 2
Market Area 1			
High-Frequency	405,000 jobs	+8% (32,000 jobs)	+0% (0 jobs)
Local	438,000 jobs	+0% (0 jobs)	+0% (0 jobs)
Basic	437,000 jobs	+0% (0 jobs)	+0% (0 jobs)
Commuter & Express	379,000 jobs	+0% (0 jobs)	+0% (0 jobs)
Market Area 2			
High-Frequency	139,000 jobs	+79% (109,000 jobs)	+0% (0 jobs)
Local	266,000 jobs	+2% (5,000 jobs)	+4% (11,000 jobs)
Basic	248,000 jobs	+0% (0 jobs)	+0% (0 jobs)
Commuter & Express	211,000 jobs	+0% (0 jobs)	+0% (0 jobs)
Market Area 3			
High-Frequency	74,000 jobs	+162% (120,000 jobs)	+0% (0 jobs)
Local	190,000 jobs	+49% (94,000 jobs)	+151% (287,000 jobs)
Basic	194,000 jobs	+0% (0 jobs)	+0% (0 jobs)
Commuter & Express	523,000 jobs	+0% (0 jobs)	+0% (0 jobs)
Market Area 4			
High-Frequency	0 jobs	+618% (1,000 jobs)	+0% (0 jobs)
Local	2,000 jobs	+1,063% (22,000 jobs)	+1,853% (38,000 jobs)
Basic	1,000 jobs	+0% (0 jobs)	+0% (0 jobs)
Commuter & Express	73,000 jobs	+0% (0 jobs)	+<1% (<1,000 jobs)
Market Area 5			
High-Frequency	0 jobs	+N/A (<1,000 jobs)	+0% (0 jobs)
Local	0 jobs	+0% (0 jobs)	+1,579% (<1,000 jobs)
Basic	0 jobs	+0% (0 jobs)	+0% (0 jobs)
Commuter & Express	5,000 jobs	+0% (0 jobs)	+0% (0 jobs)

Note: Due to rounding, there may be slight inconsistencies between the values and percentages.

Low-wage employment served

Like with the evaluation of total employment access, both scenarios benefit a similar number of low-wage jobs with some upgraded or expanded service. Scenario 1 expands the high frequency transit network to 48% more low-wage jobs and the local network to 28% more low-wage jobs, resulting in a systemwide benefit of 27% increase in access to upgraded or expanded service. Scenario 2 provides local transit service for 84% more low-wage jobs, resulting in a systemwide benefit of 21% increase in access to upgraded or expanded service. The full results for low-wage employment served can be seen in Figure 12.

Figure 12 Low-wage employment with access to a route that has an upgraded service level or to a new route by service type

Employment with access to…	Base	Scenario 1	Scenario 2
High-Frequency	268,000 jobs	+48% (129,000 jobs)	+0% (0 jobs)
Local	163,000 jobs	+28% (46,000 jobs)	+84% (136,000 jobs)
Basic	100,000 jobs	+0% (0 jobs)	+0% (0 jobs)
Commuter & Express	111,000 jobs	+0% (0 jobs)	+<1% (<1,000 jobs)
Total*	642,000 jobs	+27% (176,000 jobs)	+21% (136,000 jobs)

* This total does not reflect the total number of jobs receiving an increase in service by scenario. Those values can be seen in the Improved Transit Service measure.

Note: Due to rounding, there may be slight inconsistencies between the values and percentages.

High-wage employment served

Both scenarios benefit a comparable number of high-wage jobs with some upgraded or expanded service. Scenario 1 expands the high frequency transit network to 38% more high-wage jobs and the local network to 36% more high-wage jobs, resulting in a systemwide benefit of 26% increase in access to upgraded or expanded service. Scenario 2 provides local transit service for 97% more high-wage jobs, resulting in a systemwide benefit of 21% increase in access to upgraded or expanded service. The full results for high-wage employment served can be seen in Figure 13.

Figure 13 High-wage employment with access to a route that has an upgraded service level or to a new route by service type

Employment with access to…	Base	Scenario 1	Scenario 2
High-Frequency	349,000 jobs	+38% (133,000 jobs)	+0% (0 jobs)
Local	167,000 jobs	+36% (61,000 jobs)	+97% (163,000 jobs)
Basic	111,000 jobs	+0% (0 jobs)	+0% (0 jobs)
Commuter & Express	133,000 jobs	+0% (0 jobs)	+<1% (<1,000 jobs)
Total*	760,000 jobs	+26% (194,000 jobs)	+21% (163,000 jobs)

* This total does not reflect the total number of jobs receiving an increase in service by scenario. Those values can be seen in the Improved Transit Service measure.

Note: Due to rounding, there may be slight inconsistencies between the values and percentages.

Access to New All-Day Transit

This measure looks at the population and employment with access to the new all-day transit network, which includes high-frequency, local, and basic transit. Because Scenario 2 provides more coverage, local transit service across the region, it outperforms Scenario 1 by serving more people and jobs across all of the population and employment groups (Figure 14).

Figure 14 Population and employment with access to new all-day transit

Access to new all-day transit for…	Base	Scenario 1 (% of regional total)	Scenario 2 (% of regional total)
Population			
Total population	1,592,000 people	+3% (42,000 people)	+10% (151,000 people)
BIPOC	571,000 people	+1% (7,000 people)	+6% (32,000 people)
Low-income population	451,000 people	+1% (5,000 people)	+4% (20,000 people)
Affordable housing units	474,000 units	+1% (7,000 units)	+7% (32,000 units)
Population without auto access	42,000 people	+1% (0,000 people)	+2% (1,000 people)
Older population	207,000 people	+3% (7,000 people)	+10% (22,000 people)
Employment			
Total employment	1,158,000 jobs	+4% (49,000 jobs)	+10% (115,000 jobs)
Low-wage employment	531,000 jobs	+4% (21,000 jobs)	+10% (51,000 jobs)
High-wage employment	627,000 jobs	+4% (28,000 jobs)	+10% (65,000 jobs)

Note: Due to rounding, there may be slight inconsistencies between the values and percentages.

Network Access to Employment

Figure 15 summarizes the results of this analysis, averaged over the worker population in the Twin Cities metropolitan area. Overall, Scenario 1 provides greater job access improvements to current workers in the area. In Scenario I, area workers can reach 10% more jobs within 30 minutes, while in Scenario 2 this increase is 1.4%. Scenario 1 shows the greatest job access improvement for 30-minute trips, while Scenario 2 shows the greatest job access improvement for 60-minute trips. Averaged over all travel durations, Scenario 1 provides an 8.4% increase in job access while Scenario 2 provides a 2.3% increase.

Detailed results for this measure can be found in the *Accessibility Impacts of Bus Service Allocation Study Memo* from the Accessibility Observatory at the University of Minnesota.

Figure 15 Job Access Impact

Threshold	Baseline	Scenario 1 Change	Scenario 1 % Change	Scenario 2 Change	Scenario 2 % Change
15 minutes	1,943	+132	+6.8%	+14	+0.7%
30 minutes	20,622	+2,068	+10.0%	+277	+1.4%
45 minutes	72,630	+6,002	+8.3%	+1,795	+2.5%
60 minutes	157,530	+11,316	+7.2%	+5,897	+3.7%
Weighted	5,160	+432	+8.4%	+120	+2.3%

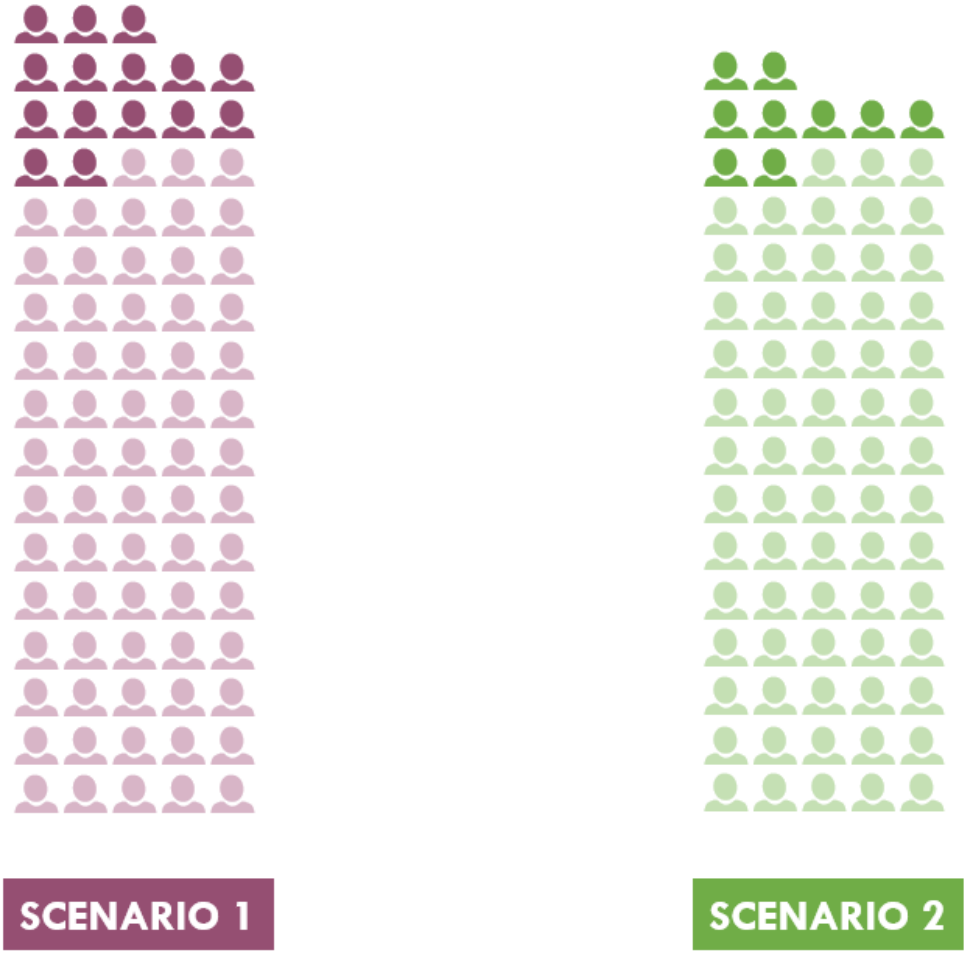
Source: Accessibility Impacts of Bus Service Allocation Study, Accessibility Observatory at the University of Minnesota

Ridership Potential

As outlined in the methodology section, estimating potential ridership impacts is a largely qualitative exercise. It is a planning level estimate of potential impacts and is not based on a more robust ridership model.

With that caveat, both scenarios will generate additional ridership. However, even with varying assumptions, Scenario 1 is likely to produce between 30 and 40 percent more ridership than Scenario 2 (Figure 16).

Figure 16 Potential Ridership Increases



Summary of Results

The following table shows a summary of the benefits of each of the two scenarios.

Figure 17 Summary of Scenario Benefits

Scenario 1	Scenario 2
Ridership Estimate Will generate between 30-40% more additional ridership than Scenario 2 **Improved Transit Service** Improves service for 37% of the region's population and 51% of the region's employment vs. Scenario 2's 27% of the population and 44% of employment Improves service for 280,000 more people than Scenario 2, 150,000 of which are low-income people and 160,000 are BIPOC Improves service for 120,000 more jobs than Scenario 2, including 60,000 low-wage jobs **Change in Access to Transit by Service Level** Provides 400,000 additional people and 220,000 additional jobs with access to high-frequency transit Most people and jobs with a change in access are in Market Areas 1 and 2 **Network Access to Jobs** Scenario 1 expands access to between 2-7 times more jobs for the average resident than Scenario 2	**Expanded Access to All-Day Transit** Scenario 2 provides 110,000 more people with access to all-day service, and 20,000 more affordable housing units than Scenario 1 Scenario 2 provides all-day access to 60,000 more jobs, of which 30,000 are low-income, than Scenario 1 **Change in Access to Transit by Service Level** Provides 380,000 additional people and 290,000 additional jobs with access to local transit Most people and jobs with a change in access are in Market Area 3