Arterial BRT Principles and Candidate Corridors

NetworkNEXT

August 2020

Metro Transit

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Introduction

This document describes the process and principles used to identify candidate arterial bus rapid transit corridors for screening, evaluation, and prioritization through the Metro Transit Network Next plan. BRT corridors prioritized through this process will form the basis for Metro Transit the arterial BRT program beyond the METRO E Line, planned for construction in 2023.

WHAT IS NETWORK NEXT?

Network Next establishes Metro Transit's vision for the bus network of 2040. It identifies opportunities to bring better transit to more people over the next 20 years in the Twin Cities. Focused on improvements beyond the existing resources available, it charts the course for new arterial bus rapid transit (BRT) lines as well as more frequent service, longer hours, and better weekend service on existing local and express routes and new bus routes in areas without fixed-route service today.

More information about Network Next can be found at metrotransit.org/network-next.

WHAT IS ARTERIAL BUS RAPID TRANSIT?

Arterial BRT has been operating in the Twin Cities region since the opening of the METRO A Line on Snelling Avenue and Ford Parkway in 2016. Since then, the C Line on Penn Avenue opened in 2019, and planning and development is continuing on the D Line, B Line, and E Line. By 2024, these five lines are planned to be in operation, pending full funding, joining a broader network of light rail and bus rapid transit lines connecting the region.

Arterial BRT is an all-day, frequent service that is faster and provides a better customer experience in corridors with strong existing local bus service. These corridors are all in highly developed areas of the region. As demonstrated by the A Line and C Line, arterial BRT can attract a high number of new transit riders and improve the experience for many existing riders.

Arterial BRT is designed to provide an improved customer experience with frequent and faster trips when compared to existing local service. This experience is delivered through a set of improvements that includes improved customer waiting facilities and changes to speed up service.

More information about Metro Transit Arterial BRT can be found at metrotransit.org/brt

A faster trip

BRT is faster than standard local bus service. Here's how:

- Buses make fewer stops (roughly every half mile), significantly speeding up trips.
- Customers pay fares at stations before boarding. There's no need to line up at the farebox.
- Low-floor buses and raised curbs at stations, plus wider bus doors and boarding from the front and back, speed up boarding.
- Extending the curb at stations saves time. Buses can merge more easily into traffic after serving a station.
- Priority at traffic signals allow buses to move through intersections a bit faster.
- Bus priority treatments—like bus-only lanes and queue jumps at intersections—provided buses a way to bypass traffic where feasible.

A more comfortable experience

Enhanced shelters at BRT stations provide protection from the weather and a safe, comfortable and convenient customer waiting space.

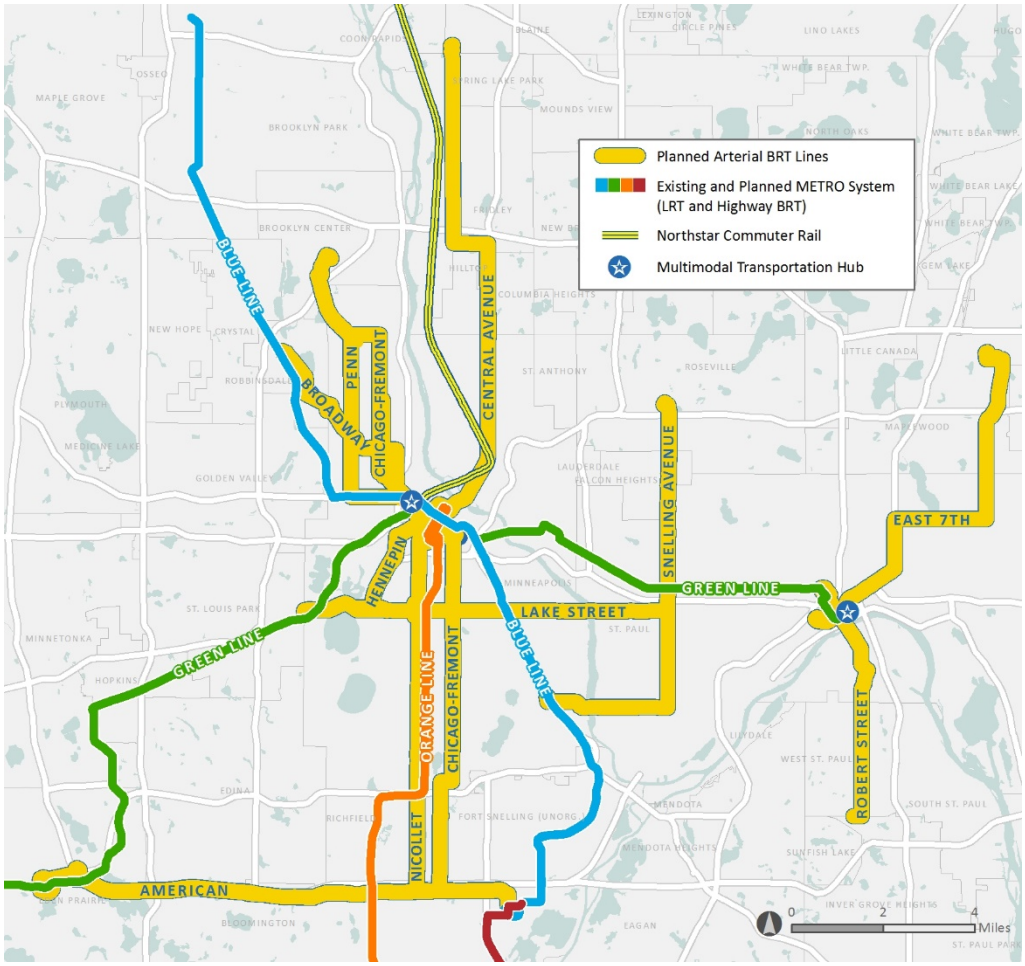
Features include:

- NexTrip signs
- Bike racks
- Information about the route, transit system, and surrounding area
- Security cameras
- Emergency phones
- Enhanced lighting
- Push-button heating
- Ticket machines for buying a ticket using cash or credit card
- Litter and recycling containers

Past planning for arterial BRT

In 2012, Metro Transit completed the Arterial Transitway Corridors Study (ATCS), which developed the arterial BRT concept and identified 11 urban corridors with high-ridership bus routes for implementation of arterial BRT. Following the completion of that study, Metro Transit explored the potential for the arterial BRT concept in two additional corridors: Chicago-Fremont, which extended the concept from Chicago Avenue into north Minneapolis on Fremont and Emerson avenues; and a new corridor, Penn Avenue. In 2014, the West 7th street corridor was removed from consideration for arterial BRT as the City of Saint Paul and Ramsey County pursued the study of rail in the corridor. Figure 1 below shows the planned arterial BRT corridors resulting from this work.

Figure 1: Planned Arterial BRT Corridors, circa 2014



The A Line and C Line, plus the three additional lines in development (D Line, B Line, and E Line), were advanced based on the corridors identified in the 2012 planning process.

At the request of local government partners, a study of an extension of the A Line from Rosedale Transit Center north to Rice Creek Commons via Snelling Avenue/Hwy 51 and Lexington Avenue was completed in 2016. That work concluded that additional pedestrian improvements and transit-supportive land uses were needed in the near term to support additional transit investment, and that additional study of this corridor should occur in the future.

In the eight years since the completion of the first arterial BRT study, our region has grown, development patterns have changed, and Metro Transit and local partners have learned more about the planning and operation of arterial BRT.

The goal of the Network Next BRT corridor planning process is to update the network of planned arterial BRT lines to reflect those changes and support the current and future transportation needs of our region. This process will identify the next arterial BRT lines to be implemented starting in 2025.

Network Next Arterial BRT Principles

There are four Network Next BRT Principles guiding the development of the arterial BRT network. These Principles were identified based on regional transit policy, the performance of the existing bus network, and outreach and engagement efforts.

ADVANCE EQUITY AND REDUCE REGIONAL RACIAL DISPARITIES

The Twin Cities region has some of the worst disparities in outcomes between white people and people of color in the nation. Transit has an important role to play in reducing those disparities. The Metropolitan Council seeks to prioritize transit improvements that improve connections between historically disadvantaged populations, including low-income populations and people of color, to jobs and opportunities throughout the region.

BUILD ON SUCCESS TO GROW RIDERSHIP

Arterial BRT corridors are designed as an improvement to existing local bus routes in corridors with demonstrated ridership success. The number of trips taken on transit and the number of people using transit is a good measure of how useful the transit network is to people. Arterial BRT improvements build on successful local service to benefit as many existing riders as possible with transitway investment and attract new riders to the system.

DESIGN A NETWORK THAT SUPPORTS A TRANSIT-ORIENTED LIFESTYLE

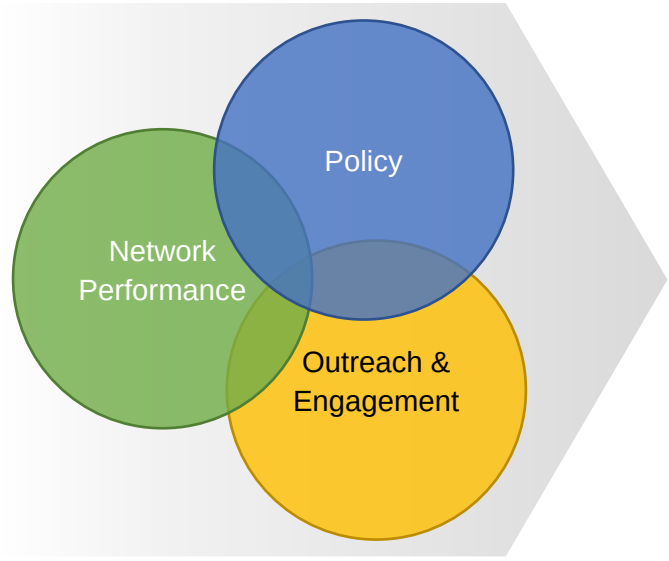
Arterial BRT candidate corridors are identified in areas that have higher residential and employment densities and walkable pedestrian infrastructure that support regular transit use. Taken together, the arterial BRT network will expand access to transit service that allows the flexibility of conveniently changing plans, getting to appointments and errands, or visiting friends and family.

ENSURE THE LONG-TERM SUSTAINABLE GROWTH OF THE BUS NETWORK

Growing the arterial BRT network in places that support frequent bus service today will help ensure that these corridor investments can be served with fast, frequent, and reliable service in the long term. Additionally, transit-supportive land use and transportation infrastructure plans will support the success and sustainability of investment in arterial BRT.

HOW WERE THESE PRINCIPLES DEVELOPED?

The key themes identified below form the basis for the development of the Network Next Arterial BRT Principles. These principles are used to identify candidate corridors and form the basis for the screening, evaluation, and prioritization of BRT corridors. They are drawn from Metropolitan Council regional transit policy, the performance of the existing bus network, and outreach and engagement work completed in 2019.



Arterial BRT Principles

- **Advance equity and reduce regional racial disparities**
- **Build on success to grow ridership**
- **Design a network that supports a transit-oriented lifestyle**
- **Ensure the long-term sustainable growth of the bus network**

Transit Policy Guidance

Metro Transit is guided by regional transit policy when making decisions related to local and express bus service planning. Thrive MSP 2040 is the primary policy document for all Council functions, and the 2040 Transportation Policy Plan is the guiding transportation system document. The themes below are a high-level summary of regional transit policy direction as applied to the development of Network Next Arterial BRT Principles.

Transit investments should aim to reduce regional disparities in access to place-based opportunities

The work completed in the Metropolitan Council's Choice, Place and Opportunity Report in 2014 shows the Twin Cities region has some of the nation's biggest disparities along racial and ethnic lines among our peer metro areas. These disparities include income, poverty, unemployment, homeownership, and education.

To address and correct these disparities, the Council will prioritize transit improvements that improve connections between historically disadvantaged populations, including low-income populations and people of color, to jobs and opportunities throughout the region.

Transit investments should focus on growing ridership

Ridership is a key indicator of the success of the transit network, and meeting the regional economic, environmental, and social goals related to transit investment depend on growing transit ridership. Growing ridership is identified as an explicit goal in regional transit policy and forms the underlying basis for the Transit Market Areas, Route Design Guidelines, and Performance Standards included in the Transportation Policy Plan.

Transit investments should be made in concert with land use changes

Since much of our region developed around roads and private automobiles, the changes in land use and urban form required to make transit successful in many places are significant. To effectively leverage our regional transit investments, the Council will need strong local partners who are willing to plan and invest in their communities and coordinate with neighboring communities to develop around transit.

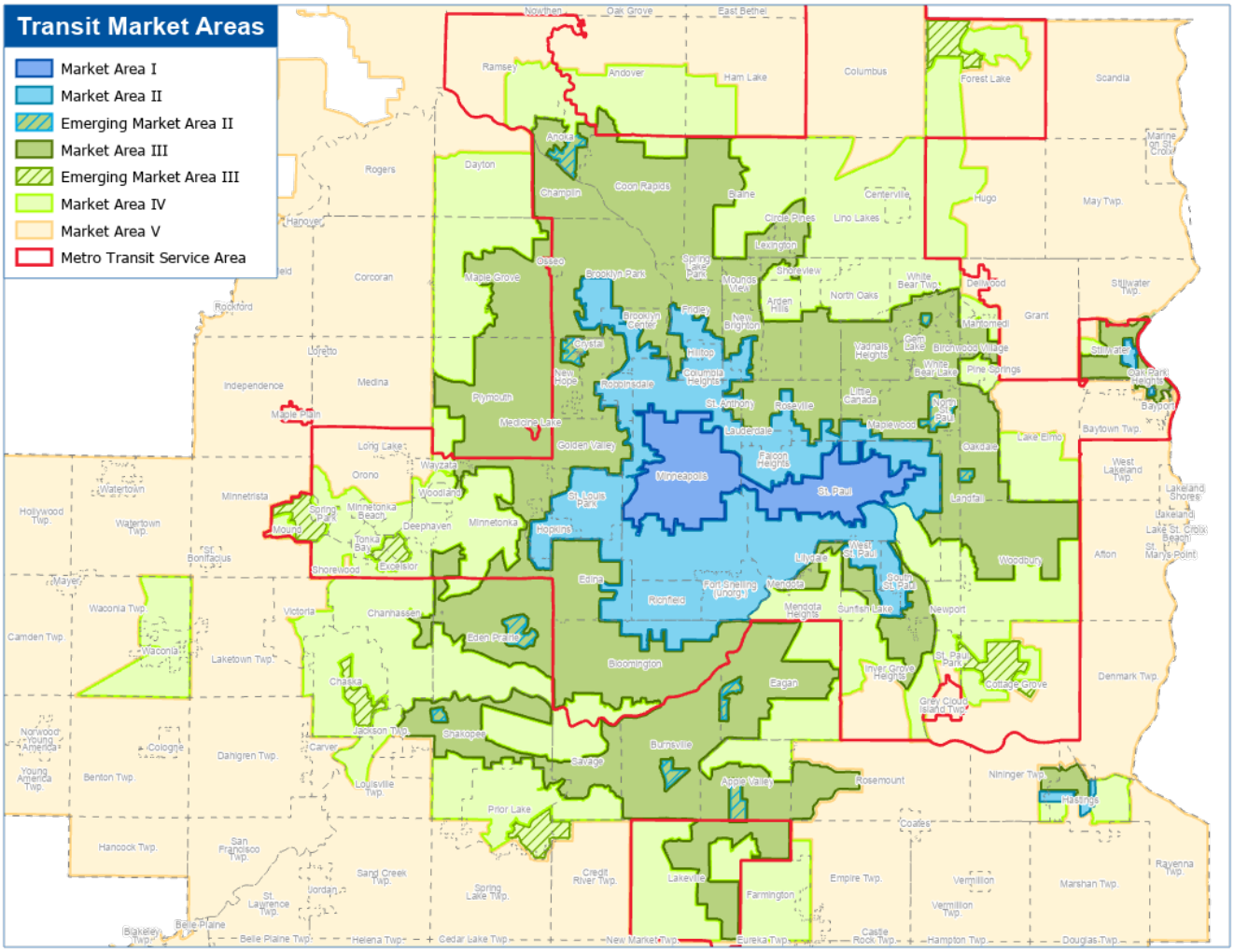
Transit investments should consider regional geographic balance

To advance prosperity across the Twin Cities area, the Council will intentionally consider regional balance—that is, balancing its investments and activities across the region—in its planning, operations, and investment decisions. Because development patterns vary across the region, advancing regional balance does not guarantee that all parts of the region will receive the same level or intensity of service or investments. Rather, advancing regional balance will be a consideration that helps all parts of the region be considered for investments that at a scale appropriate commensurate with the current level of development.

Transit Market Areas guide the allocation of transit service

The 2040 Transportation Policy Plan divides the region into five different Transit Market Areas shown in Figure 2, which are used to estimate potential transit demand and guide the types and level of transit service that various areas of the region can support. They provide general guidance on how transit service should be allocated throughout the region, based on land use characteristics and expected transit demand. Transit Market Area I is the area of highest expected transit demand, while Transit Market Area V is the area of lowest expected demand. Market Areas I and II generally have the potential transit ridership necessary to support the most intensive fixed-route transit service with higher all-day frequencies and longer service hours, like arterial BRT.

Figure 2: Transit Market Areas

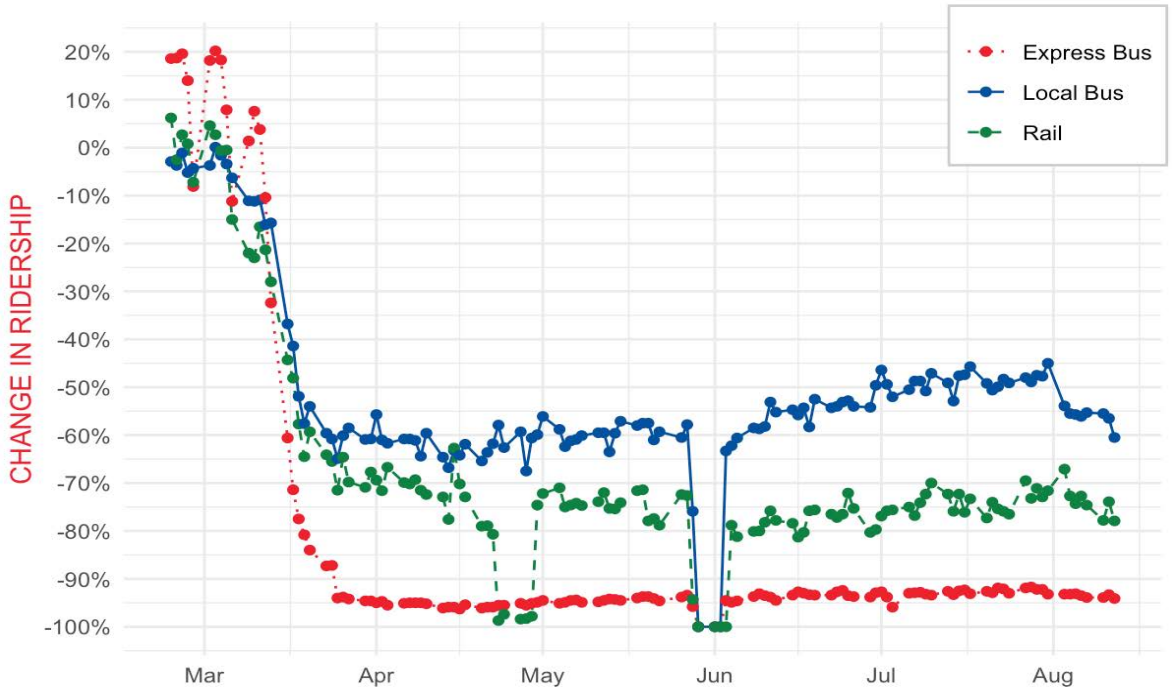


Current Bus Network Performance

Understanding how the current bus network performs is a critical step to identifying principles to guide the planning of the future arterial BRT network. In reviewing current performance, we are better able to replicate successes and mitigate challenges.

Note that the analysis shown below is based on 2019 performance, prior to the COVID-19 pandemic and associated impacts on bus ridership and transportation patterns more generally. While the ridership declines due to the COVID-19 crises are widespread across the transit network, the effects are most strongly felt in express and 9-5 work trip-oriented services. As shown in Figure 3, local routes serving multiple trip types with ridership distributed throughout the day—including those serving as the basis for candidate BRT corridors—are more resilient and have experienced lower relative ridership declines than other services.

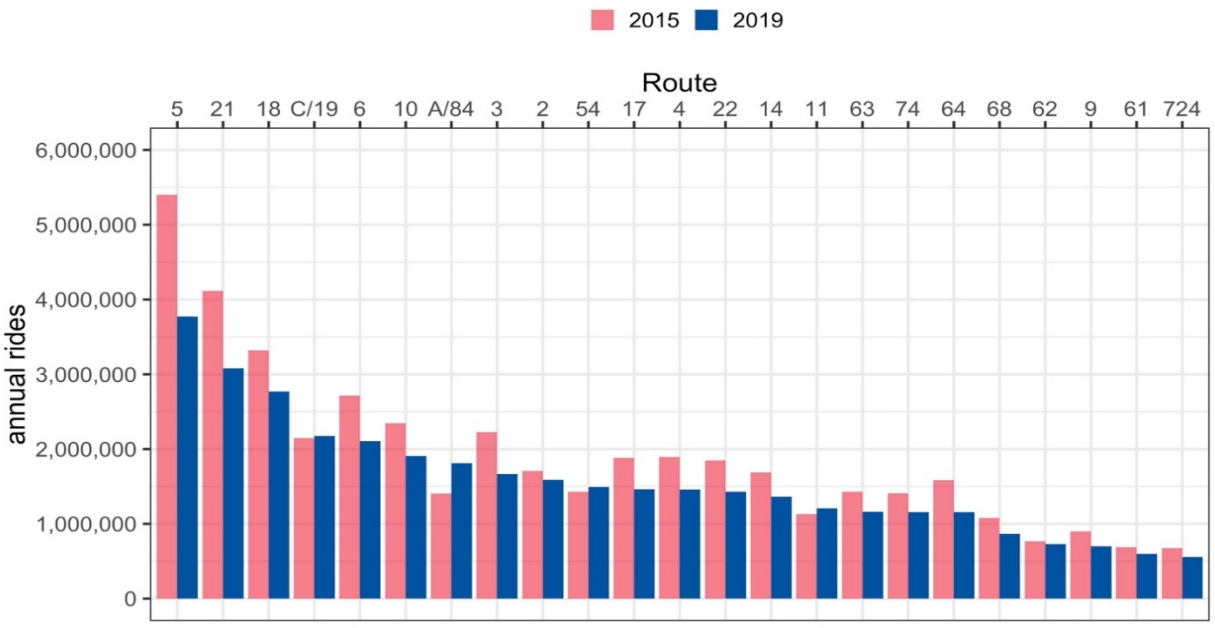
Figure 3: Percent Change in Ridership by Route Type, March-August 2020



Service and reliability improvements in core areas have demonstrated ridership success

Recent service and reliability improvements in a few key transit corridors, especially the A Line and C Line, have demonstrated a path to reversing nation-wide bus ridership declines. Figure 4 shows the change in annual ridership by route for the highest ridership Metro Transit routes since 2015.

Figure 4: Annual Ridership by Route, 2015 - 2019



These routes have two characteristics in common: first, they have had service improvements like increased frequency, bus stop consolidations to speed up travel, and in the case of BRT, improved amenities at stations and on vehicles. Second, they primarily serve portions of the region with high demand for transit because of dense land use, walkable neighborhoods, and relatively low auto ownership. This ridership increase is particularly pronounced in the METRO A Line and C Line, which have seen corridor ridership grow by over 30 percent since implementation. Figure 5 and Figure 6 below show the monthly ridership in these corridors.

Figure 5: A Line Corridor Monthly Ridership, June 2014-January 2020

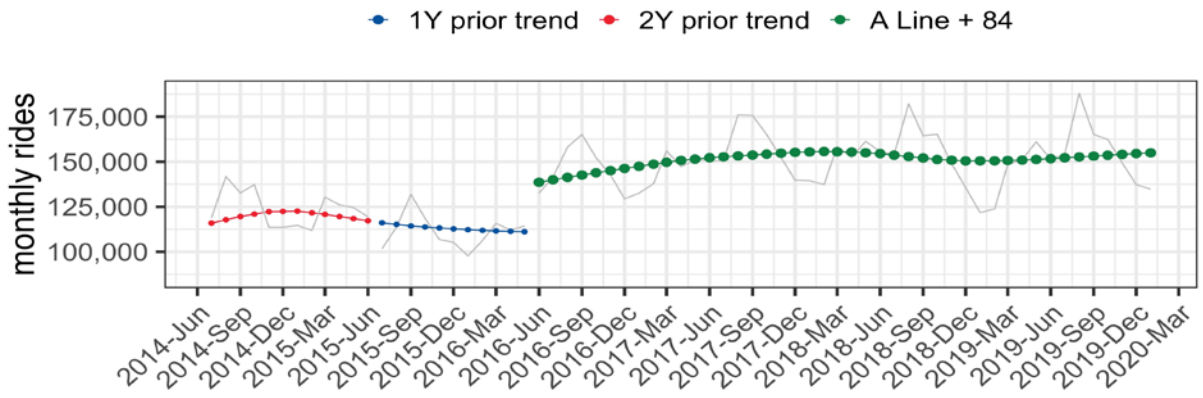
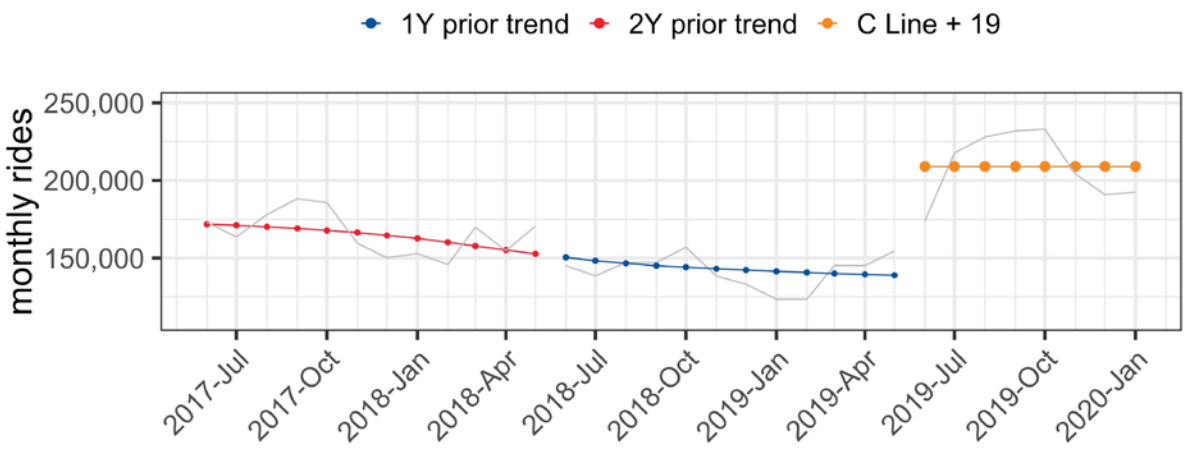


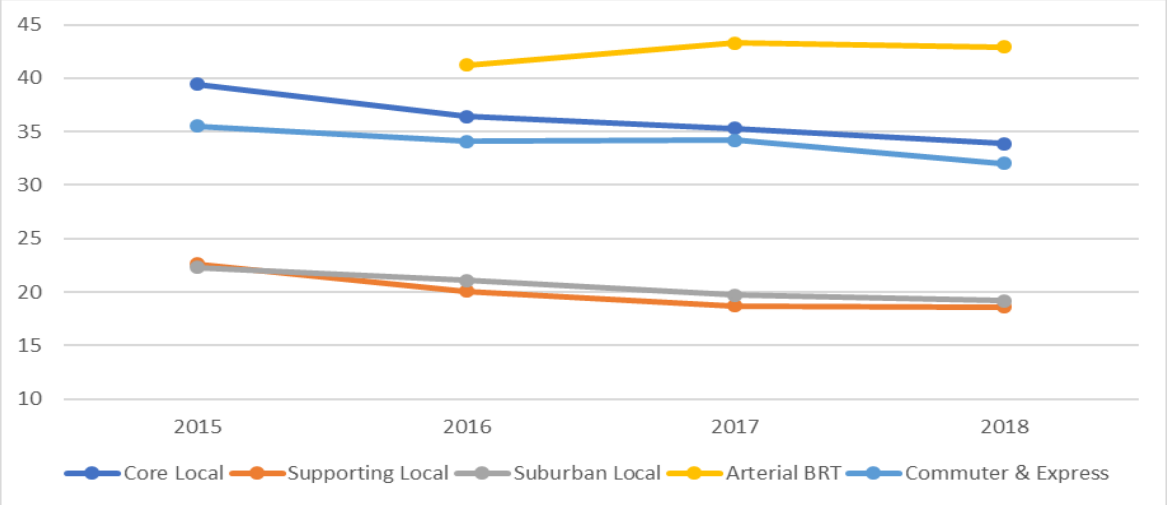
Figure 6: C Line Corridor Monthly Ridership, June 2017-January 2020



Productivity has been declining across the bus network, except on arterial BRT

Productivity – the number of passengers riding per hour each bus is in service – has followed the trend of declining system-wide bus ridership. Since 2015, core local bus routes have declined from an average of 40 passengers per in-service hour to less than 35 passengers per in-service hour. Similar declines have occurred on the other local route types and on Commuter and Express routes. Figure 7 shows bus passengers per service hour by route type since 2015.

Figure 7: Bus Passengers per Service Hour by Route Type, 2015 - 2018



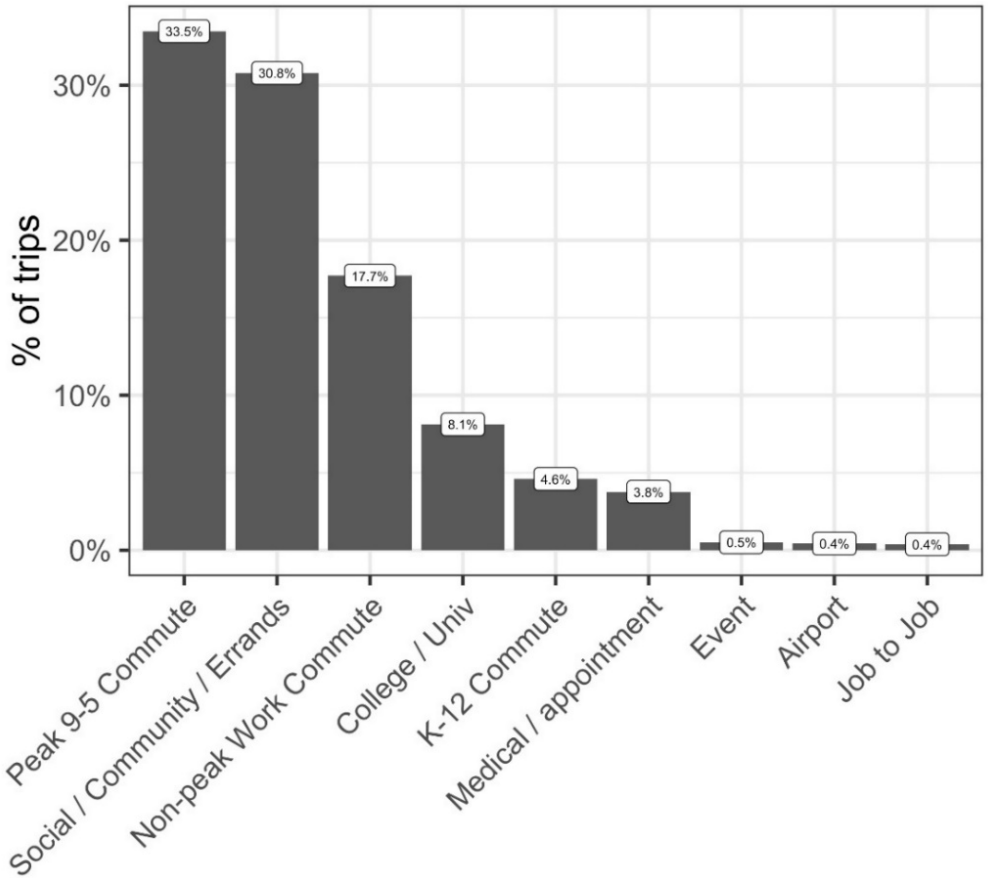
Productivity on arterial BRT has increased since the introduction of the METRO A Line in 2016, from about 41 passengers per in-service hour to about 43 passengers per in-service hour, as ridership has grown while service levels have remained consistent.

Expanded off-peak service supporting multiple trip purposes is an opportunity to grow ridership

Transit service levels and ridership patterns throughout the day do not track with overall regional travel patterns by all modes. Instead, overall regional travel demand jumps around 7:00 a.m. and remains at a roughly constant level the rest of the day before the afternoon rush.

Paired with the observation that most trips on transit are taken for a trip purpose other than a 9-to-5 commute, this suggests there may be a market for transit not currently served well during the midday and evenings outside of the weekday rush hours to accommodate trips occurring on other modes during these times. Figure 8 shows overall percent of ridership by trip purpose. About two-thirds of all Metro Transit rides occur for a reason other than a 9-5 commute trip.

Figure 8: Percent of Total Rides by Trip Purpose, 2016



Outreach and Engagement

In 2019, Metro Transit developed a Network Next engagement approach that included customer-focused tradeoffs survey, community-hosted engagement events, and direct outreach to customers at major transit centers and park-and-rides.

Several themes from this outreach emerged to inform the principles that guide arterial BRT planning:

- Improve the weekday and weekend frequency of existing service
- Prioritize faster, more frequent service to reduce overall travel times
- Make investments to improve reliability of service
- Generally, focus on improving service where people are more likely to ride the bus

More on each of these themes is summarized below. A detailed summary of the engagement approach and results can be found at metrotransit.org/network-next.

Improve the weekday and weekend frequency of existing service

Overwhelmingly, participants in the community-hosted conversations identified increasing the frequency of existing service as one of their most desired improvements. Long wait times, and the additional planning lower service frequencies require, were identified as major barriers to using transit at all and major sources of inconvenience and disruption when using transit.

This feedback was almost always coupled with comments related to the need for not only frequent but reliable service. Besides reducing wait times, frequency was identified as a value because it offset the issue of missing a bus or making up time when a bus is late. Bus overloads on the highest ridership routes were also cited a reason to increase frequency and ensure on-time buses.

Participants articulated a need for more weekend service, more closely matching the frequency and span of service available on weekdays. A desire for a single weekend schedule, as opposed to different schedules for Saturdays and Sundays, was a common theme as well.

Prioritize faster, more frequent service to reduce overall travel times

Reducing overall travel time emerged as one of the key themes from the outreach and engagement effort. By significant margins, survey respondents prioritized improved travel times over reducing walk or roll distance to bus stops and minimizing transfers.

Participants in community-hosted conversations also prioritized travel time over minimizing transfers. This was particularly true if the transfers were convenient and didn't require long waits for the connecting service. As noted above, participants were averse to transfers when they added a lot of time to the overall trip or

forced them to travel out of direction (for example, when traveling between suburbs, needing to go downtown to transfer between routes).

Many participants in community-hosted conversations emphasized that while they share an appreciation for reducing the number of stops to speed up service, the specific stop locations are very important. They stressed the need to maintain stop locations that serve important destinations like public housing, senior housing, medical institutions, childcare, and grocery stores. The hardship of walking or rolling long distances and waiting during weather events, or while carrying groceries or traveling with small children was mentioned frequently.

Make investments to improve reliability of service

In many of the community-hosted conversations, there was a great deal of feedback regarding on-time performance and the desire to see better reliability. Participants identified late buses, missed trips, and unreliable service as a major problem.

Discussions about improvements such as frequency, span, and coverage often used poor reliability and late buses as one of the key issues supporting the need for improvements to the other improvements. For example, some participants identified frequent service as insurance against late or missing buses.

Generally, focus on improving service where people are more likely to ride the bus

Most community-hosted conversation participants emphasized focusing resources on prioritizing improvements to existing bus service. Conversations around coverage often centered around making trips technically possible on the transit network today easier and faster to complete, rather than providing access to new areas. Survey respondents also prioritized improvements in areas where people ride the bus most often.

However, an important exception that emerged in community-hosted conversations was expanding transit service in urban areas to suburban job destinations. Job centers that are outside of the existing bus network were identified as a barrier to using transit more often.

Arterial BRT Corridor Planning Process

The process to develop the updated network of arterial BRT corridors consists of four steps, shown below. Each step links to the principles identified in the previous section.

STEP 1: IDENTIFY

Based on the Network Next BRT principles, identify approximately 20 candidate corridors to be screened for their fit for arterial BRT implementation.

STEP 2: SCREEN

Conduct screening evaluation to identify the most promising Arterial BRT candidate corridors from the group identified in phase one.

STEP 3: EVALUATE

Develop detailed arterial BRT concepts and apply robust evaluation using criteria that incorporate cost, ridership, benefits, and other quantitative data.

STEP 4: PRIORITIZE

Review top-performing arterial BRT concepts based on a set of project readiness criteria to further prioritize concepts for implementation; this includes a review of coordination with the opening of major transitway projects, coordination with local partners, potential revenue streams, and other capital investment efficiencies.

OUTCOMES

This plan will identify the next 3-4 arterial BRT lines to be implemented beginning in 2025. The advanced corridors to be evaluated and prioritized will be sorted into tiers representing near-, medium-, and long-term priorities for implementation. The highest priority lines in the first tier will be assigned a corridor letter (F, G, H, etc.) based on their planned order of implementation.

The specific implementation order of the advanced corridors sorted into medium- and long-term tiers will be determined later and not as part of this planning process. The network of future arterial BRT corridors is planned to be updated approximately every five years to reflect successful corridor implementation, integrate changing development patterns, and remain consistent with regional priorities. Through this process, existing planned corridors will be reevaluated, and new candidate corridors may be considered.

Candidate corridors that are not advanced for near-term BRT implementation may nevertheless be (and likely are) good candidates for other types of transit improvements. This could include increasing the span and frequency of the existing local routes in the corridor as well as implementing speed and reliability improvements including bus stop consolidation, bus-only lanes, and other bus priority treatments. Planning to identify improvements to the local bus network is targeted to continue in 2021, as the long-term impact of the COVID-19 pandemic becomes better understood.

Arterial BRT Candidate Corridor Identification

ARTERIAL BRT CANDIDATE CORRIDORS

Figure 9 shows a map of the arterial BRT candidate corridors identified for screening. These corridors are listed in Table 1.

Figure 9: Arterial BRT Candidate Corridors

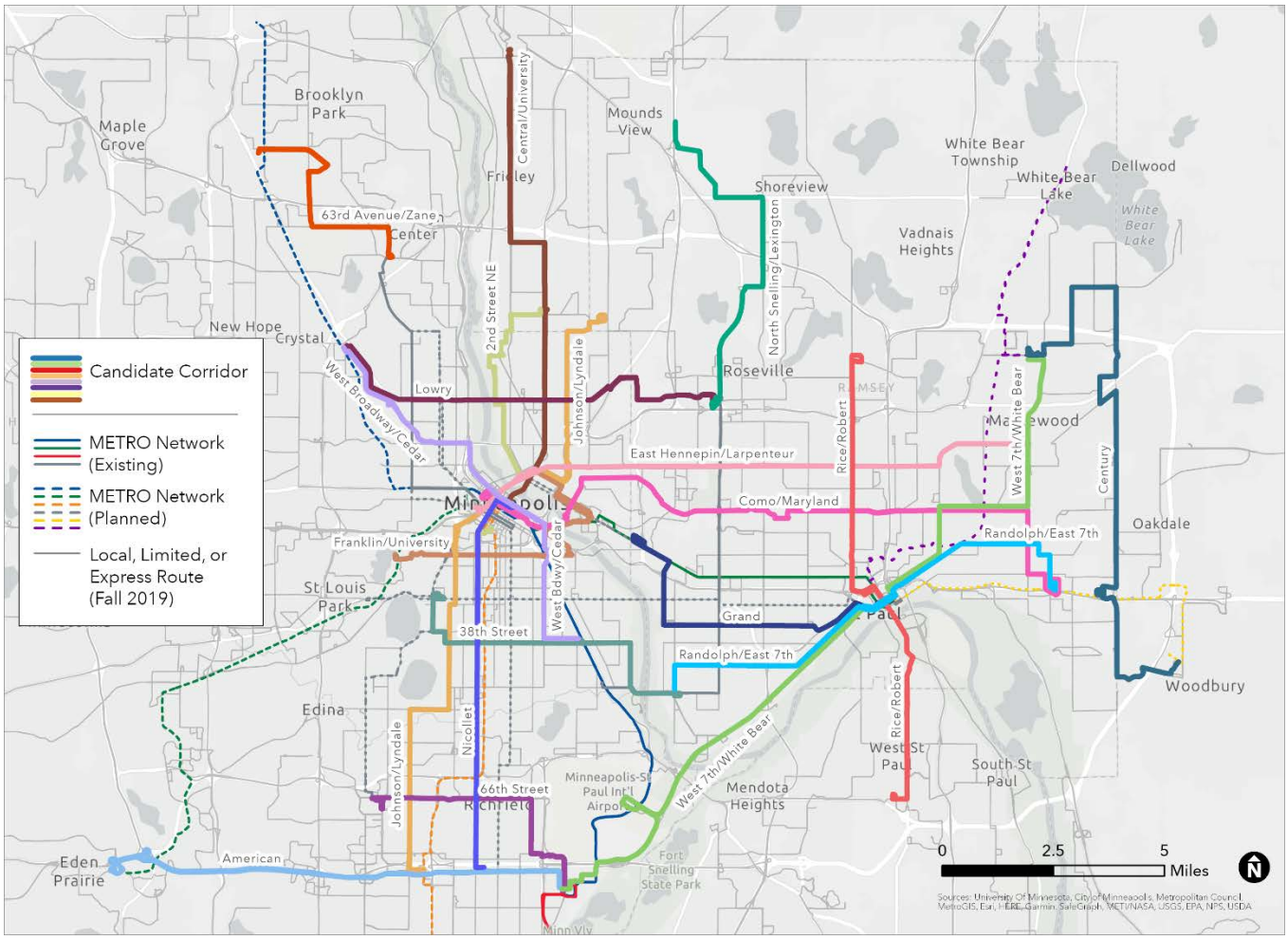


Table 1: Arterial BRT Candidate Corridors

Candidate Corridor	Approximate Terminals	Primary Underlying Route(s)
2nd Street NE	Downtown Minneapolis to Columbia Heights Transit Center	11
38th Street	Uptown Transit Station to Cleveland Ave. S and Ford Pkwy.	23
63rd Avenue/Zane	Starlite Transit Center to Brooklyn Center Transit Center	724
66th Street	Southdale Transit Center to Mall of America Transit Station	515
American	Mall of America Transit Station to SouthWest Station	542
Central	Downtown Minneapolis to Northtown Transit Center	10
Como/Maryland	Downtown Minneapolis to Sun Ray Transit Center	3
East Hennepin/Larpenteur	Downtown Minneapolis to White Bear Ave.	61
Franklin/University	21st St Station to SE 8th St. and Central Ave. NE	2
Grand	Westgate Station to downtown Saint Paul	63
Johnson/Lyndale/Penn	Silver Lake Village to W 82nd St. and Knox Ave. S	4
Lowry	Robbinsdale Transit Center to Rosedale Transit Center	32
Nicollet	Downtown Minneapolis to American Blvd.	18
North Snelling/Lexington	Rosedale Transit Center to TCAAP Redevelopment	225
Randolph/East 7th	Cleveland Ave. S and Ford Pkwy. to Sun Ray Transit Center	74
Rice/Robert	Dakota Co. Northern Service Center to Little Canada Transit Center	62, 68
West 7th/White Bear	Maplewood Mall Transit Center to Mall of America Transit Station	54
West Broadway/Cedar	Robbinsdale Transit Center to 38th St. Station	14, 22

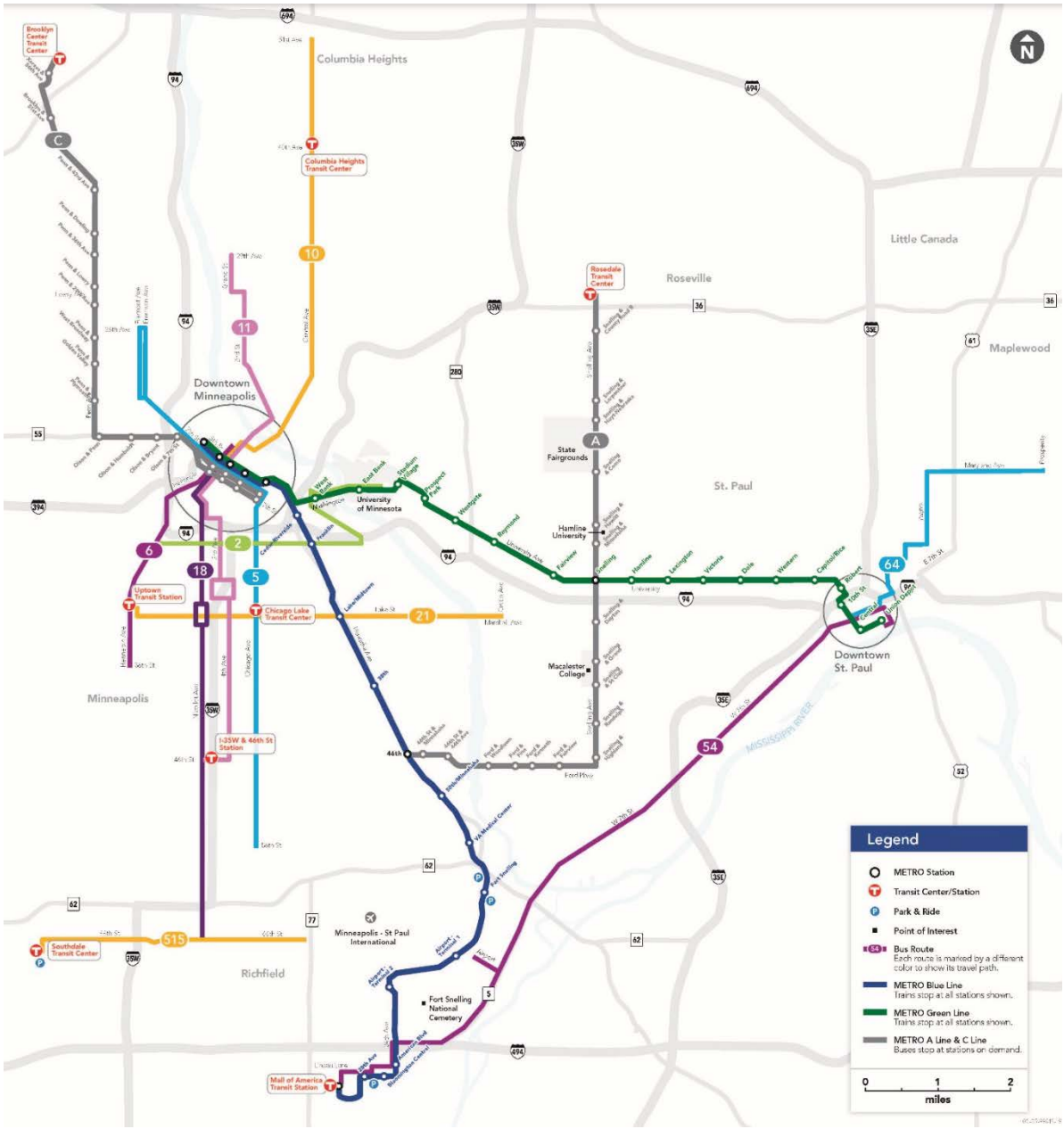
APPLICATION OF BRT PRINCIPLES

Based on the Network Next principles identified in the previous section, these candidate corridors were selected using the following additional considerations.

High Frequency network

The Metro Transit High Frequency network, consisting of routes operating every 15 minutes or better on weekdays and Saturday, was the starting point for the identification of candidate corridors. A map of this network is shown in Figure 10. These routes have demonstrated both ridership success and long-term sustainability, in addition to forming the core structure of the existing local bus network.

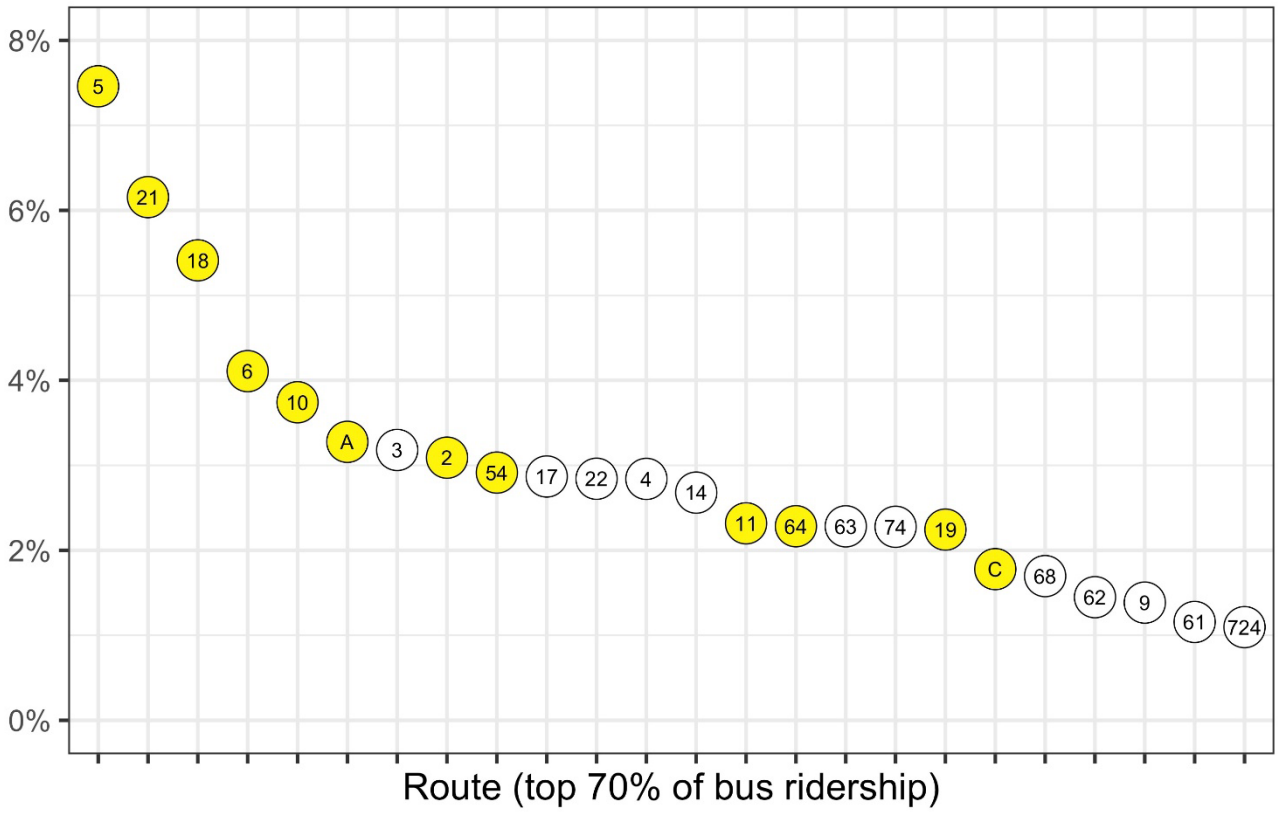
Figure 10: Metro Transit High Frequency Network, 2019



Highest ridership corridors

Several existing local routes have relatively high ridership but are not yet part of the High Frequency network. These routes were also considered in the identification of candidate corridors based on demonstrated ridership success and importance to the overall network. Figure 11 shows the highest ridership Metro Transit routes in 2019. Routes highlighted in yellow are included in the existing High Frequency Network.

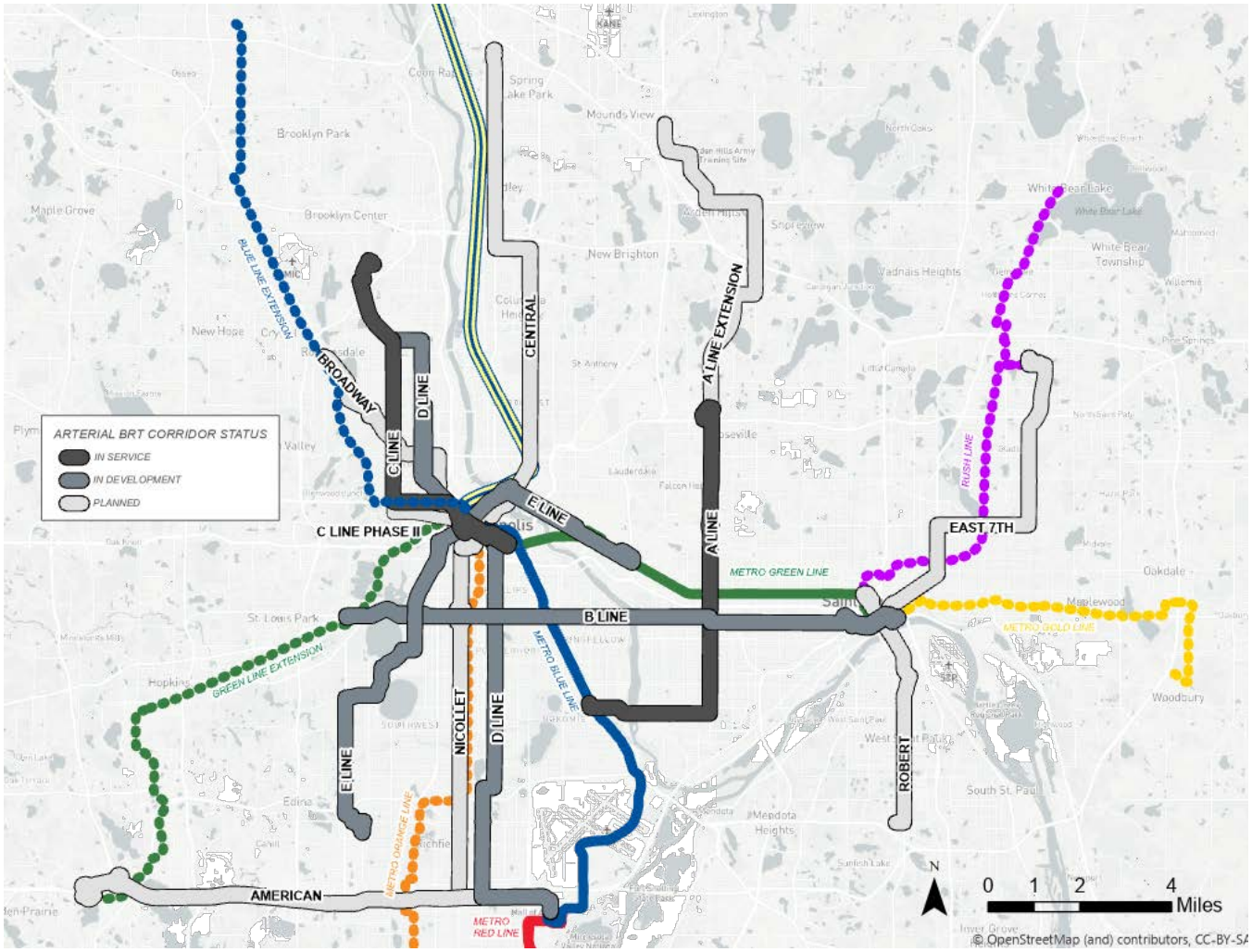
Figure 11: Percent of Total Bus Ridership by Bus Route. 2019



Corridors previously studied for arterial BRT

Several corridors that have previously been studied for arterial BRT are included in this evaluation. These include corridors identified in the 2012 ATCS and the A Line Extension studied in 2016. These corridors are mapped in Figure 12.

Figure 12: Planned Arterial BRT Corridors, circa 2019



Network balance

Candidate corridors were also identified based on the need to ensure a balanced and useful overall network, rather than a collection of individual corridors. Specific consideration was given to the geographic distribution and overall role in the network of candidate corridors, with special attention to ensuring good cross-town connections to other routes and destinations. Some deviations from the underlying local bus route were made in order to better accomplish these goals. Local priorities for arterial BRT study were also considered.

Next Steps

The 19 identified arterial BRT candidate corridors will be screened to identify a smaller group of the most promising corridors to advance for further concept development, evaluation, and prioritization. The screening criteria will be based on the BRT principles identified in this document and will consist of both quantitative and qualitative metrics.