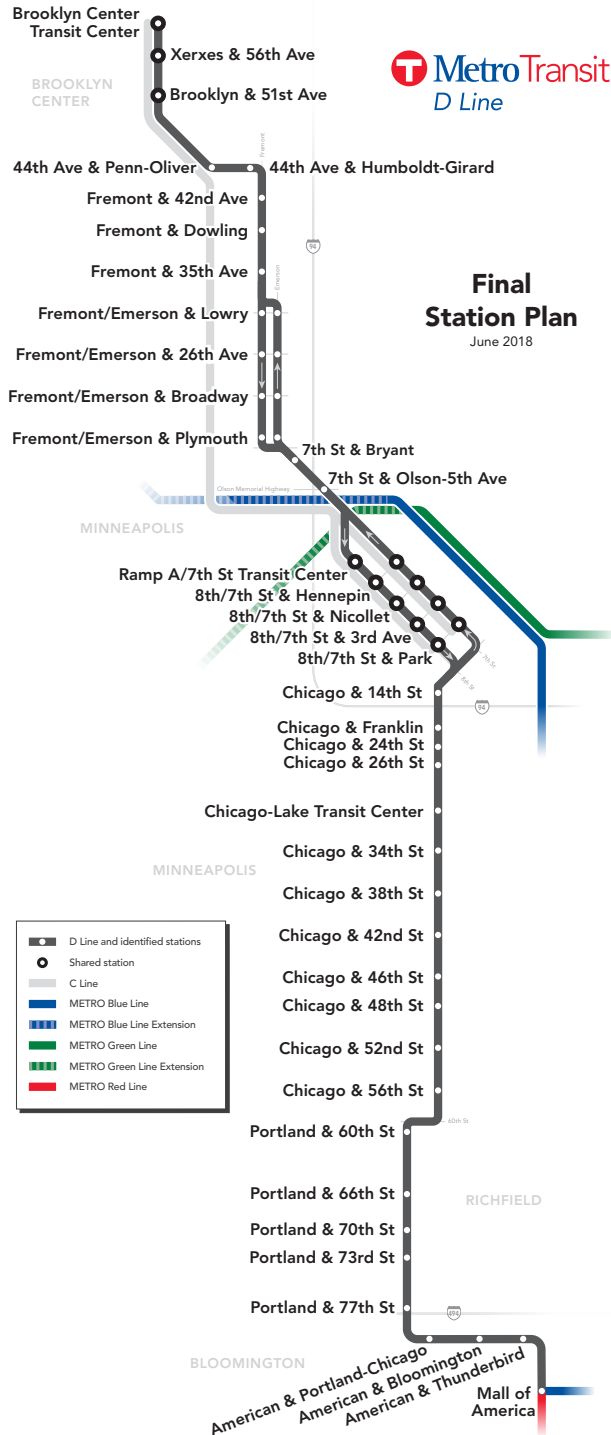


I. Introduction

This document establishes the final station plan for the D Line rapid bus project, focusing on the planned station and platform locations at the intersection and intersection corner level. See Figure 1 for the final D Line station locations. Upon approval by the Metropolitan Council, this document will guide the D Line design process anticipated to occur in 2018 and 2019. The D Line is currently targeted for construction in 2020 and 2021, pending full project funding.

Figure 1: Final D Line station concept map

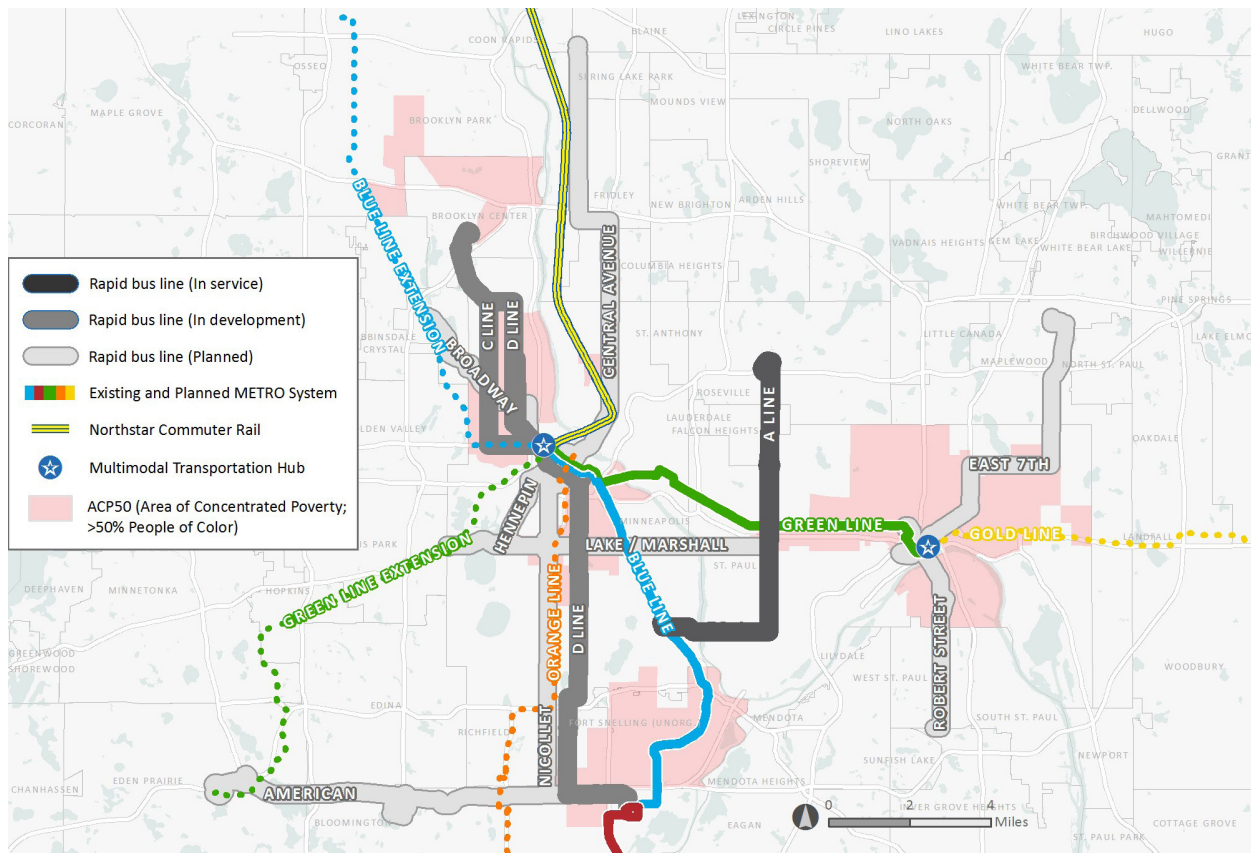


The D Line is a planned rapid bus line that will upgrade and substantially replace Route 5, Metro Transit’s highest ridership bus route. The D Line corridor stretches approximately 18 miles from the Brooklyn Center Transit Center to the Mall of America Transit Center, serving Fremont/Emerson Avenues in north Minneapolis, 7th/8th Streets in downtown Minneapolis, Chicago Avenue and Portland Avenue in south Minneapolis, Portland Avenue in Richfield, and American Boulevard in Bloomington.

Rapid bus (also called arterial bus rapid transit, or BRT) is a package of transit enhancements that produces a faster trip and an improved experience for customers in the Twin Cities’ busiest bus corridors. It runs on urban corridors in mixed traffic.

The D Line will be the third operational line within the Twin Cities region’s rapid bus system. The A Line on Snelling Avenue and Ford Parkway began service in June of 2016; the C Line on Penn Avenue is targeted to begin service in 2019.

Figure 2: Planned rapid bus network



Rapid Bus Overview

Rapid bus is designed to provide an improved customer experience with faster and more frequent trips when compared to existing local service. This experience is delivered through a package of improvements that includes enhanced customer facilities and greater operational efficiency.

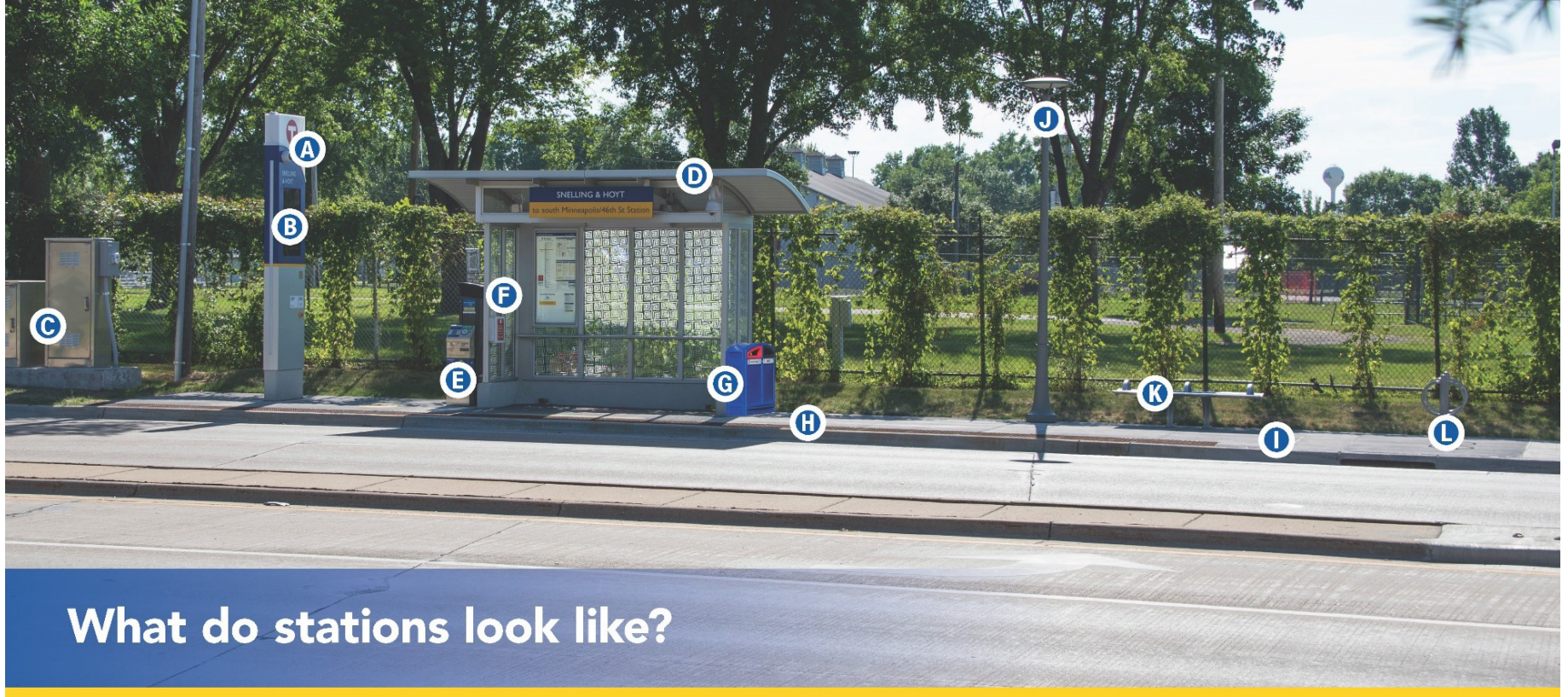
Every planned rapid bus corridor is unique in street design and surrounding land use. As a result, each line balances flexibility with implementation strategies with core rapid bus characteristics. The following characteristics of rapid bus will be implemented to the extent possible given the context and unique aspects of each planned station along the corridor.

Station Features

Rapid bus brings a light-rail quality experience to bus corridors by providing faster and more efficient service, and station and bus amenities that foster an improved customer experience. See Figure 3 for additional information on the design and features of rapid bus stations in the Twin Cities. Section IV also provides more information on important station characteristics. General information is provided below.

- Curb bumpouts / curb extensions
 - » Rapid bus runs in general traffic, with bumpouts (also called curb extensions or bus bulbs) at stations where feasible. Today, many existing local bus stops are located out of a thru-lane of traffic in right-turn lanes or in a curbside parking lane, causing delay for buses merging back into traffic. Curb bumpouts at station platforms eliminate delay-inducing merging movements. They also provide extra space for station amenities and pedestrians on existing sidewalks. Additionally, to facilitate near-level boarding, curb heights will be increased to nine inches from the standard six where possible.
- Off-board fare payment
 - » Like on the A Line and light rail, customers will pay fares prior to boarding the bus. Ticket vending machines and fare card validators will be located at each station. Off-board fare payment expedites the boarding process and significantly decreases dwell time at stations, allowing buses to stop briefly in the travel lane rather than pull over. Fare payment will be enforced through random on-board inspections by Metro Transit Police.
- Shelters
 - » Shelters provide weather protection while customers wait for the bus. Standard rapid bus shelters feature on-demand heaters and integrated lighting, as well as emergency telephones. Shelters range from 12 to 36 feet long, depending on site conditions and ridership. A concrete foundation increases protection from the elements and helps establish more permanence compared to standard shelters.
- Information
 - » Detailed transit information is provided in a variety of formats to offer clear direction and increase customer confidence in trip status. Each station includes a pylon landmark sign with a real-time dynamic display and a printed panel with timetable, maps, and connection information.
- Furnishings and other improvements
 - » Several station components will enhance customer safety and comfort, including security cameras and telephones and adequate clear zone for boarding and alighting through any bus door. Benches, trash receptacles, and bike racks will be available for customer use.

Figure 3: Rapid bus station features



What do stations look like?

- A** Pylon markers help riders identify stations from a distance.
- B** Real-time NexTrip displays provide bus information, and on-demand annunciators speak this information for people with low vision.
- C** Utility boxes near station areas house necessary communications and electrical equipment.
- D** Shelters provide weather protection and feature on-demand heaters and integrated lighting. Shelter sizes will vary based on customer demand (small shown here).
- E** Ticket machines and fare card validators collect all payment before customers board the bus.
- F** Emergency telephones provide a direct connection to Metro Transit security. Stations also feature security cameras.
- G** Stations feature trash and recycling containers.
- H** Platform edges are marked with a cast-iron textured warning strip to keep passengers safely away from the curb while the bus approaches. Many stations also feature raised curbs for easier boarding.
- I** Platform areas are distinguished by a dark gray concrete pattern.
- J** Some stations have sidewalk-level light fixtures to provide a safe, well-lit environment. Fixtures will match existing lights in the surrounding area.
- K** Benches at stations provide a place to sit.
- L** Stations have bike parking loops.

Operational Improvements

- Limited stops and increased frequency
 - » Rapid bus stations are spaced approximately every half-mile, focusing on upgrading stops to stations where the greatest numbers of customers board buses today. More distance between stations significantly increases overall travel speeds when compared to local bus stop spacing of 1/8 mile (the length of a north-south block in Minneapolis), while also allowing for most customers to access stations comfortably on foot.
 - » High frequency service increases the convenience of rapid bus. The D Line will become the primary service in the corridor, running every ten minutes throughout the day with increased service on nights and weekends compared to the existing Route 5.
 - » Existing local service on Route 5 will be maintained with reduced frequency generally every 30 minutes to provide continued local service for customers who cannot or choose not to walk to a nearby station.
- Rapid bus vehicles
 - » Rapid bus vehicles have distinctive branding to differentiate them from standard buses. D Line buses will be 60-foot articulated vehicles to serve large numbers of riders, with three wide doors to allow customers to enter and exit through all doors of the vehicle. All buses will be low-floor vehicles to help facilitate boarding and alighting for all customers, and buses will have modified seating layouts for more interior circulation space. Accessibility ramps will remain for those customers using a mobility device.
- Transit signal priority (TSP)
 - » Buses will be linked to traffic signals throughout the corridor to provide transit signal priority when conditions allow. A TSP system will allow buses to request early green time and/or extended green time to allow movement through the intersection. TSP helps reduce time spent stopped at red lights, a substantial source of bus delay.

Figure 4: D Line Articulated Bus Rendering



Background

While Twin Cities rapid bus has been operating since 2016, origins behind the concept developed in the mid-2000s. In 2008, the Metropolitan Council's *2030 Transit Master Study*¹ identified high-rider-ship arterial corridors that could potentially foster transitways with high-quality bus or rail service. The study noted that constrained right-of-way availability and substantial community impacts precluded the possibility of bus or rail service in dedicated travel lanes on many of these corridors. However, it was demonstrated that faster and more frequent service along these corridors could substantially increase ridership.

The 2009 update to the Metropolitan Council's *2030 Transportation Policy Plan*² (TPP) further identified nine specific arterial corridors for additional study of rapid bus. These nine corridors and two additional routes formed the foundation for 2012's *Arterial Transitway Corridors Study*³ (ATCS). The ATCS presented the basic components of how rapid bus would operate in the Twin Cities and offered initial concept-level station locations, ridership estimates, and costs for the eleven lines.

Chicago Avenue was one of the original corridors identified in the *2030 Transit Master Study* for further study of arterial rapid bus. During ATCS development in 2011 and 2012, concerns about transit coverage northwest of downtown Minneapolis, a high-service area included in Route 5 but not considered for rapid bus, prompted the recommendation of extending the proposed Chicago Avenue line through north Minneapolis on Emerson-Fremont Avenues. The ATCS concluded that the extended corridor could operate more efficiently than a standalone Chicago Avenue corridor, because implementing rapid bus service over the entire length of Route 5 would better replace duplicative local bus service. The final ATCS report recommended that the line and particularly this extension be further studied prior to implementation. An ATCS addendum⁴, which incorporated the extended corridor, was released in January 2013.

The addition of Emerson-Fremont Avenues to the Chicago Avenue corridor positioned it as the highest-scoring corridor in a technical evaluation, and Metro Transit recommended implementation in the near term. Subsequently, the 2030 TPP was amended in May of 2013 to include the extended corridor. The D Line was further solidified as a planned transitway within the *2040 Transportation Policy Plan*⁵, adopted in 2015.

Purpose and Need

The Chicago-Emerson/Fremont (Route 5) corridor needs additional transit capacity. With average daily ridership of about 15,500 rides per weekday in 2016, Route 5 consistently ranks as Metro Transit's top performing local bus route. It also ranks among the top five routes for passengers per in-service-hour, a measure of productivity that indicates a high level of usage for the existing transit service on the Chicago-Emerson/Fremont corridor.

1 Available at <https://metro council.org/METC/files/cc/cc84f33-a760-4c3b-84d7-3140425ec352.pdf>

2 Available at: <https://metro council.org/Transportation/Planning/Transportation-Policy-Plan/Previous-2030-Policy-Plan.aspx>

3 Available at: <https://www.metrotransit.org/abrt-study>

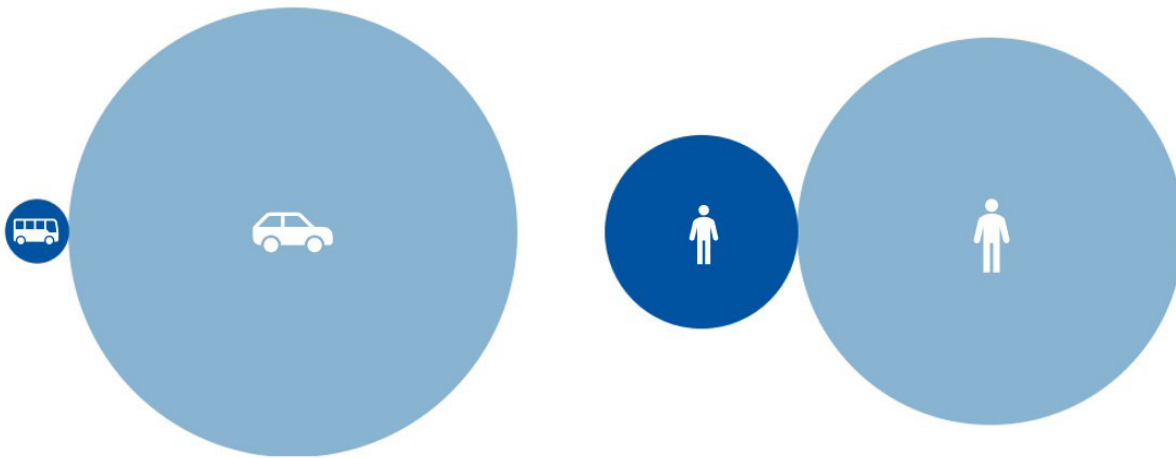
4 Available at: <https://www.metrotransit.org/abrt-study>

5 Available at: [https://metro council.org/Transportation/Planning-2/Key-Transportation-Planning-Documents/Transportation-Policy-Plan-\(1\)/The-Adopted-2040-TPP-\(1\).aspx](https://metro council.org/Transportation/Planning-2/Key-Transportation-Planning-Documents/Transportation-Policy-Plan-(1)/The-Adopted-2040-TPP-(1).aspx)

Figure 5: Vehicle and Passenger Movement through Route 5 Corridor

Less than 2% of Vehicles

More than 20% of Passengers



System-wide bus ridership has dropped over the past few years, and Route 5 is no exception despite being the busiest local route in the system. The exception to this pattern is the A Line, which opened in June 2016. Over its first year of operation, the corridor saw consistent daily ridership increases of over 30 percent. After crossing the one-year mark, daily ridership on the route averages five to ten percent higher than the previous year, when the A Line was already operating.

With implementation of D Line rapid bus, the Route 5 corridor could see similar results. Speeds along Route 5 are currently slow. During peak hours, it can take more than 45 minutes to travel about eight miles from the Brooklyn Center Transit Center to downtown Minneapolis, and another 45 minutes to travel about 10 miles from downtown to the Mall of America in Bloomington. Additionally, Route 5 has below-average on-time performance, averaging under eighty percent so far in 2017, and often ranking in the bottom quarter of local routes in the system. Operational changes, like transit signal priority, off-board payment, and fewer and more dispersed stations, would all significantly reduce travel time and improve on-time performance.

Figure 6: Route 5 average weekday ridership, 2014-2017

Year	Quarter	Average Weekday Ridership
2014	First	16,900
2014	Second	18,400
2014	Third	18,000
2014	Fourth	18,800
2015	First	16,600
2015	Second	17,400
2015	Third	16,800
2015	Fourth	16,500
2016	First	15,800
2016	Second	15,800
2016	Third	15,200
2016	Fourth	15,200
2017	First	14,700
2017	Second	14,700
2017	Third	13,900

The purpose of the D Line is to enhance transit service and facilities along the Route 5 corridor with increased service frequency, faster speeds, and a more comfortable customer experience without substantially altering the existing roadway.

II. Planning Process

Rapid bus on the Chicago-Emerson/Fremont corridor was prioritized for implementation by adoption into the amended *2030 Transportation Policy Plan*⁶ in 2013 and the *2040 Transportation Policy Plan*⁷ in 2015. Since that time, Metro Transit has implemented a D Line planning process that includes a mix of interagency coordination, data analysis and review, and community outreach and engagement.

The planning process will continue into 2018 as the *D Line Station Plan* moves through a public review process before final approval by the Metropolitan Council. Final approval of a *D Line Station Plan* is planned for the summer of 2018.

The main objective of the *D Line Station Plan* is to confirm station and platform locations at the intersection and intersection quadrant level. The approved document will guide the project's design phase. The planning phase will conclude with the Metropolitan Council's approval of the final *D Line Station Plan*. See Figure 7 below for more project development process information.

Figure 7: Project development process



The following sections highlight key components of the D Line planning phase.

Initial Review

An important part of the D Line planning phase included the review of a variety of materials to help identify early station location recommendations and areas with particularly challenging planning issues. Project staff considered previous planning in the Arterial Transitway Corridors Study⁸, ridership data, the existing transit network, and roadway design to identify locations or corridor segments requiring further review.

6 More information at: [https://metrocouncil.org/Transportation/Planning/Transportation-Policy-Plan/2030-Transportation-Policy-Plan-\(1\).aspx](https://metrocouncil.org/Transportation/Planning/Transportation-Policy-Plan/2030-Transportation-Policy-Plan-(1).aspx)

7 More information at: [https://metrocouncil.org/Transportation/Planning-2/Key-Transportation-Planning-Documents/Transportation-Policy-Plan-\(1\)/The-Adopted-2040-TTP-\(1\).aspx](https://metrocouncil.org/Transportation/Planning-2/Key-Transportation-Planning-Documents/Transportation-Policy-Plan-(1)/The-Adopted-2040-TTP-(1).aspx)

8 More information at: <https://www.metrotransit.org/abrt-study>

This early internal review helped focus the planning process on key considerations and station location issues that the public and agency partners could influence. These unresolved locations became the focus for additional planning review with agency partners and the public.

Project Coordination

An important part of the D Line planning phase has included coordination with other planned infrastructure projects throughout the corridor being built by partner agencies like Hennepin County or the City of Minneapolis. See Section III for more information on coordination with specific projects.

Emerson-Fremont Avenues bicycle-pedestrian improvement project (City of Minneapolis)

In some cases, coordination between projects was initiated several years ago to ensure compatibility and reduce impacts. Project coordination was a major factor for early station location considerations in north Minneapolis. In 2014, Metro Transit and the City of Minneapolis coordinated planning of the City's Emerson-Fremont Avenues bicycle-pedestrian improvement project⁹ and D Line station locations. As a result, substantial D Line planning recommendations in the north Minneapolis area were made earlier compared to other parts of the corridor. See Section III for more information about coordination with the Emerson-Fremont Avenues bicycle-pedestrian improvements project, including the recommended station locations developed through this coordination.

Planning Issues Review

Specific planning issues and unresolved station locations were considered throughout 2017 with a multi-agency Technical Advisory Committee and a variety of community outreach and engagement activities. This work resulted in the recommendation of station locations presented in this *Station Plan*. See Figure 8 for a concept map identifying unresolved station locations that were the focus of 2017's planning issues review. The station locations resulting from the planning issues review are shown in Figure 1's D Line station concept map.

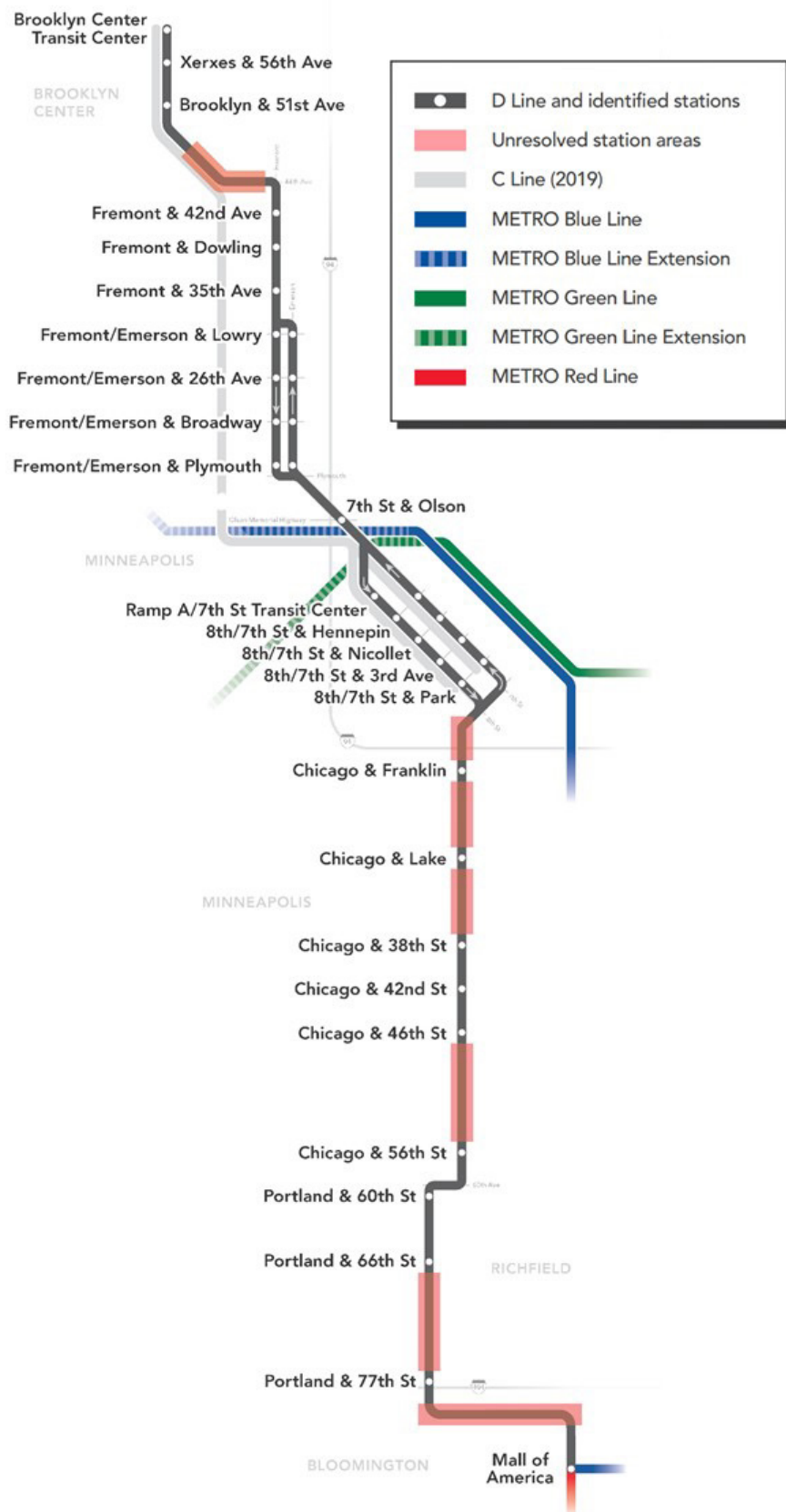
Technical Advisory Committee

The Technical Advisory Committee (TAC) consists of interagency partners advising the project on station location issues throughout the corridor. The TAC met monthly throughout 2017. Station location recommendations in this *Station Plan* were made in coordination with the TAC, which includes:

- Hennepin County
- City of Brooklyn Center
- City of Minneapolis
- City of Richfield
- City of Bloomington
- Minneapolis Park and Recreation Board

⁹ More information at: <http://www.ci.minneapolis.mn.us/cip/future/emerson-fremont>

Figure 8: Draft concept map identifying unresolved station areas for 2017 planning review



Community Outreach and Engagement

A variety of outreach and engagement activities occurred throughout 2017 to help inform station location recommendations in this Station Plan. Types of activities included:

- Providing information, facilitating conversations, and seeking targeted feedback at neighborhood group meetings
- Tabling to provide information and seek feedback at community events like community festivals or Open Streets events
- Meeting with area businesses to discuss potential D Line station locations
- Surveying customers about the D Line and the Chicago-Lake Transit Center
- Presenting and receiving feedback at transportation committees of local governments

For more information about past meetings and presentations, see the D Line project website¹⁰.

D Line Station Plan Process

Draft D Line Station Plan Review

A community outreach and engagement process was implemented along with the publication of the draft *D Line Station Plan* to help finalize the document prior to Metropolitan Council approval. Public open houses, on-bus outreach, electronic and print communications, interactive online plan review, and opportunities for one-on-one conversations with Metro Transit staff helped inform recommendations in this revised *D Line Station Plan*. The draft *D Line Station Plan* comment period lasted 30 days after the release of the document. The draft *D Line Station Plan* is available on the D Line project website¹¹.

Approach to Outreach and Engagement

Recognizing that not every stakeholder participates in project development in the same way, Metro Transit used a variety of activities to reach the broadest audience possible. Activities included open houses, coordination with neighborhood associations, and a newsletter distribution. Social media posts encouraged stakeholders to review the draft *D Line Station Plan* online and provide comments. Metro Transit staff conducted on-bus outreach throughout the comment period, creating an opportunity for customers to learn about and comment on the *D Line Station Plan* directly with staff while traveling on the corridor.

More information on the variety of draft *D Line Station Plan* outreach and engagement activities is described below. Information on meetings and events held throughout D Line project development can be found on the project website¹².

Open Houses

Open houses were scheduled events for stakeholders to engage with the draft *D Line Station Plan* and provide input on station intersections and platform locations. Project staff was available to answer questions, including site-specific concerns along the corridor. Events at transit centers throughout the

10 More information at: <https://www.metrotransit.org/d-line-meetings>

11 More information at: <https://www.metrotransit.org/d-line-library>

12 More information at: <https://www.metrotransit.org/d-line-meetings>

corridor helped provide additional opportunities for existing Route 5 customers to learn about an comment on the draft *D Line Station Plan*. Metro Transit hosted six scheduled open houses:

- **February 13:** Chicago-Lake Transit Center (Minneapolis)
- **February 15:** City of Richfield Municipal Center (Richfield)
- **February 17:** Mall of America Transit Center (Bloomington)
- **February 21:** North Community High School (Minneapolis)
- **February 22:** Wellstone International High School (Minneapolis)
- **March 3:** Brooklyn Center Transit Center (Brooklyn Center)

On-Bus Outreach

Metro Transit staff brought planning materials on Route 5 buses to give more riders an opportunity to comment on the draft *D Line Station Plan*. Materials were distributed to over 150 customers and helped guide conversations with staff about the D Line and proposed station locations. Staff conducted on-bus outreach on five weekdays during the outreach period:

- **February 6:** North of downtown Minneapolis
- **February 9:** South of downtown Minneapolis
- **February 14:** South of downtown Minneapolis
- **February 20:** North of downtown Minneapolis
- **February 28:** North of downtown Minneapolis

Publications

Metro Transit distributed project information through a variety of media. An email newsletter was created to deliver project news to interested stakeholders. Targeted social media posts promoted the draft plan and opportunities for comment to specific geographic locations. Metro Transit also communicated with neighborhood groups about the draft *D Line Station Plan* and the opportunity to comment.

In addition to the Metro Transit materials below, local media also published a variety of stories about the D Line and the draft Station Plan promoting the public comment period.

- **February 5:** Distribution of draft *Station Plan* and comment period notification to over 40 community group contacts, including an offer for staff to provide project presentations
- **February 6:** Twitter post promoting comment period for draft *D Line Station Plan*
- **February 6:** D Line article published on Metro Transit's *Rider's Almanac* blog
- **February 12:** Facebook post promoting comment period on draft *D Line Station Plan* and Chicago-Lake Transit Center open house. Post was targeted to south Minneapolis.
- **February 12:** Distribution of D Line newsletter
- **February 13:** Facebook post promoting comment period on draft *D Line Station Plan* and Richfield Municipal Center open house. Post was targeted to Richfield.
- **February 15:** Facebook post promoting comment period on draft *D Line Station Plan* and Mall of America open house. Post was targeted to Bloomington.

- **February 19:** Facebook post promoting comment period on draft *D Line Station Plan* and North Community High School open house. Post was targeted to north Minneapolis
- **February 19:** Facebook post promoting comment period on draft *D Line Station Plan* and Wellstone International High School open house. Post was targeted to south Minneapolis
- **February 19:** Facebook post promoting comment period on draft *D Line Station Plan* and Brooklyn Center Transit Center open house. Post was targeted to Brooklyn Center.

Other

- **February 10:** Tabling at the City of Minneapolis Community Connections event
- **February 12:** Project presentation (information item) to the Metropolitan Council Transportation Committee
- **March 1:** Phillips West Neighborhood Organization community meeting

Recommended *D Line Station Plan* Process

After the conclusion of the draft *D Line Station Plan* process, the draft document was revised to incorporate public input. The revised document resulted in the recommended *D Line Station Plan*. Major recommended Station Plan revisions are summarized below. Following Metropolitan Council authorization to release the document on May 9, 2018, comments were accepted through an additional 30-day public comment period.

Revisions within the recommended Station Plan

The recommended *D Line Station Plan* included three major revisions resulting from the draft *D Line Station Plan* process. More information about each revision is available within the relevant individual station plans in Section V (Station Plans).

- An additional station is recommended at the intersection of 7th Street and Bryant Avenue in north Minneapolis.
- An additional station is recommended at the intersection of Chicago Avenue and 48th Street in south Minneapolis.
- An additional station is recommended at the intersection of Portland Avenue and 70th Street in Richfield.

The three recommended station additions generally reflect public input supporting an increase in rapid bus access. Other considerations included access to commercial nodes, pedestrian conditions, and the Metropolitan Council's regional equity goals.

In addition, the recommended Station Plan identified a long-term coordination opportunity to investigate the potential to incorporate rapid bus platforms within a future Osseo Road reconstruction between Penn Avenue and 49th Avenue in north Minneapolis's Victory neighborhood. A specific year for improvements is unknown at this time. See the 44th Avenue & Penn-Oliver area station plan within Section V (Station Plans) for more information.

Outreach and engagement activities

Metro Transit conducted a variety of community outreach and engagement activities to inform the community of the changes between the draft and recommended versions of the Station Plan. Over 50 comments were formally submitted to the project during the 30-day comment period spanning between May 9 and June 8, 2018. Outreach and engagement activities included:

- In-person meetings with neighborhood groups, community organizations, and their constituents (five meetings held)
- In-person conversations or meetings with businesses throughout the corridor (over 70 businesses reached)
- Direct contact via phone or email to all neighborhood groups, nonprofit organizations, faith communities, and businesses within a quarter-mile of a planned D Line station (over 300 contacts)
- Internal and external newsletter and social media pieces
- Literature shared on community boards
- Conversations with Route 5 customers

Significant staff attention was given to the areas surrounding the station additions within the recommended Station Plan (7th Street & Bryant, Chicago & 48th Street, and Portland & 70th Street). About three quarters of the comments submitted during the recommended Station Plan comment period addressed the Chicago & 48th Street station location. Additionally, this work established connections with station neighbors that will continue into the D Line design phase to ensure the best possible platform “fit” within the surrounding context.

See Appendix B and Appendix C for more information about comments submitted during the draft and recommended *D Line Station Plan* comment period.

Final *D Line Station Plan* Approval

After the close of the recommended Station Plan’s 30-day comment period, text revisions were made to finalize the plan for Metropolitan Council approval as the final *D Line Station Plan*.

No changes to station and/or platform locations are proposed between the recommended and final versions of the *D Line Station Plan*.

The final *D Line Station Plan* will go before the Metropolitan Council for approval in the summer of 2018. This approved final *D Line Station Plan* finalizes station and platform locations before D Line detailed design begins in mid-2018.

III. Project Implementation & Timeline

Anticipated Project Schedule

The D Line process consists of three major components:

- Planning (2016-2018)
- Design (2018-2019)
- Construction (2020-2021, pending funding availability)

Planning Phase (2016-2018)

See Section II for more information about the D Line planning phase. The D Line planning phase will conclude with the adoption and approval of the final *D Line Station Plan* by the Metropolitan Council, anticipated in the summer of 2018. The approved *D Line Station Plan* will finalize station locations and key station components to inform the design phase.

Design Phase (2018-2019)

Following Metropolitan Council approval of the final *D Line Station Plan*, engineering and design will begin in 2018 and continue into 2019.

Construction Phase (2020-2021)

The D Line is targeted for construction in 2020 and 2021, pending full project funding availability.

Construction and system testing would lead to the beginning of revenue service in 2021 or 2022. This timeline is subject to change.

Coordinated Implementation

The D Line project will continue to be developed in coordination with a variety of planned infrastructure projects throughout the corridor, as summarized below. More project coordination information for individual station locations is available within Section V.

44th Avenue/Webber Parkway reconstruction project (Hennepin County)

Hennepin County is planning to reconstruct 44th Avenue/Webber Parkway between Penn Avenue and Lyndale Avenue and 41st Avenue North.¹³ Construction is anticipated to begin in 2020. To minimize disruption, the design and construction of D Line platforms and the 44th Avenue/Webber Parkway reconstruction project will be coordinated to the extent possible.

- » **Coordinated stations:**
 - 44th Avenue & Penn-Oliver area
 - 44th Avenue & Humboldt-Girard area

¹³ More information at: <https://www.hennepin.us/residents/transportation/webber44avenue>

Emerson-Fremont Avenues bicycle-pedestrian improvement project (City of Minneapolis)

The City of Minneapolis plans to improve bicycle and pedestrian facilities on Emerson-Fremont Avenues in 2018.¹⁴ D Line station locations were coordinated in advance of the city's 2014 application

Regional Solicitation funding and confirmed in late 2016. Coordination ensures that bicycle-pedestrian improvements will not be impacted by D Line station locations.

- » **Coordinated stations:**
- » • Fremont & 42nd Avenue
- » • Fremont & Dowling
- » • Fremont & 35th Avenue
- » • Emerson-Fremont & Lowry
- » • Emerson-Fremont & 26th Avenue
- » • Emerson-Fremont & West Broadway
- » • Emerson-Fremont & Plymouth

METRO Green Line Extension (Metro Transit) and 7th Street bikeway improvements (City of Minneapolis)

The METRO Green Line Extension project¹⁵ will add a traffic signal at 7th Street and 5th Avenue and bicycle and pedestrian improvements along 7th Street. The City of Minneapolis is a partner in implementing these bike and pedestrian improvements. D Line platform design and construction will be coordinated with the METRO Green Line Extension to the extent possible.

- » **Coordinated stations:**
- » • 7th Street & Bryant
- » • 7th Street & Olson-5th Avenue

Hennepin Avenue reconstruction project (City of Minneapolis)

The City of Minneapolis plans to reconstruct Hennepin Avenue from Washington Avenue to 12th Street beginning in 2020.¹⁶ The design and construction of the 8th Street & Hennepin platform will be coordinated with this reconstruction project to the extent possible.

- » **Coordinated stations:**
- » • 8th Street & Hennepin

¹⁴ More information at: <http://www.ci.minneapolis.mn.us/cip/future/emerson-fremont>

¹⁵ More information at: <https://metro council.org/Transportation/Projects/Current-Projects/Southwest-LRT.aspx>

¹⁶ More information at: <http://www.ci.minneapolis.mn.us/cip/future/WCMSP-172270>

Franklin Avenue Highway Safety Improvement Project (Hennepin County)

Hennepin County plans to make safety improvements at the intersection of Chicago Avenue and Franklin Avenue through the MnDOT Highway Safety Improvement Program. The project is currently planned for construction in 2020 or 2021 and will include safety features like curb extensions and signal improvements. Project coordination will reduce construction impacts and result in a more compatible design that accommodates both projects.

- » **Coordinated stations:**
- » • Chicago & Franklin

46th Street Highway Safety Improvement Project (Hennepin County)

Hennepin County plans to make safety improvements through the MnDOT Highway Safety Improvement Program along 46th Street, including the intersection of Chicago and 46th Street. The project is currently planned for construction in 2019 or 2020 and will include safety features like signal modifications and pedestrian ramp improvements. Coordination will reduce construction impacts and result in a more compatible design that accommodates both projects

- » **Coordinated stations:**
- » • Chicago & 46th Street

Portland Avenue bicycle and pedestrian improvements (Hennepin County)

Hennepin County plans to construct pedestrian and bicycle improvements along Portland Avenue between 60th and 66th Streets. Design of the D Line will be coordinated to the extent possible with the Portland Avenue improvements to balance the needs of all roadway users, including transit riders, pedestrians, and bicyclists. Construction of the planned bicycle and pedestrian improvements is planned for 2020.¹⁷

- » **Coordinated stations:**
- » • Portland & 60th Street
- » • Portland & 66th Street

Mall of America Transit Center renovation (Metro Transit)

The D Line station will be integrated into the planned Mall of America Transit Center renovation project to be completed in 2019. The transit center will be improved with rapid bus-ready improvements that can be utilized by the D Line.

- » **Coordinated stations:**
- » • Mall of America Transit Center

¹⁷ More information at: <https://metrocouncil.org/Transportation/Planning-2/Transportation-Funding/Regional-Solicitation/2016-Submitted-Applications/MULTI-USE-TRAILS-BIKEWAYS/5217HennCoTr.aspx>

Shared C Line and D Line Stations

The D Line will share several stations in Brooklyn Center and downtown Minneapolis with the C Line¹⁸. These stations will have been built or made rapid bus-ready by the C Line project in 2018-2019:

- » • Brooklyn Center Transit Center
- » • Xerxes & 56th Avenue
- » • Brooklyn & 51st Avenue
- » • Ramp A/7th Street Transit Center
- » • 7th Street & Hennepin
- » • 7th Street & Nicollet
- » • 7th Street & 3rd/4th Avenue
- » • 7th Street & Park Avenue
- » • 8th Street & Nicollet (to be built in coordination with 8th Street reconstruction, 2019-2020)
- » • 8th Street & 3rd/4th Avenue (to be built in coordination with 8th Street reconstruction, 2019-2020)
- » • 8th Street & Park Avenue (to be built in coordination with 8th Street reconstruction, 2019-2020)

18 More information at: <https://www.metrotransit.org/c-line-project>

IV. STATION CHARACTERISTICS

Several major considerations influence the design of a rapid bus station, including:

- Intersection location of station (including station spacing)
- Platform location
- Shelter size
- Curb location
- Platform length

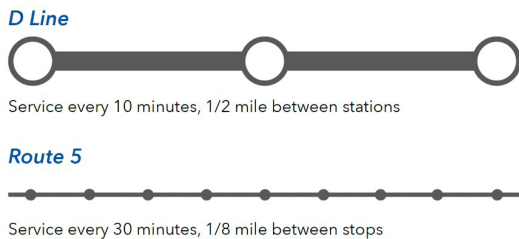
Additional background information guiding station decisions is below. These considerations played a central role in developing each station plan within Section V.

After station plan approval, this document will guide the detailed design of stations by confirming station intersections and platform location at those intersections. Other characteristics will be finalized through detailed engineering in the upcoming design phase.

Station location: Why this intersection?

A key objective of rapid bus is to offer faster trips for more people along the corridor. Faster trips depend in part upon the strategic placement of stations spaced more widely than existing Route 5 bus stops. Spacing stations on average every half mile is a foundational consideration in station planning. The existing Route 5 stops approximately every 1/8-mile. This increase in station spacing distance is anticipated to help D Line service operate about 20 percent faster than the existing Route 5, when combined with other improvements. Serving today's customers well and maximizing future ridership along the corridor depends upon station locations serving substantial numbers of passengers without adding significant walk distance.

Figure 9: Rapid bus and local service stop spacing after D Line implementation



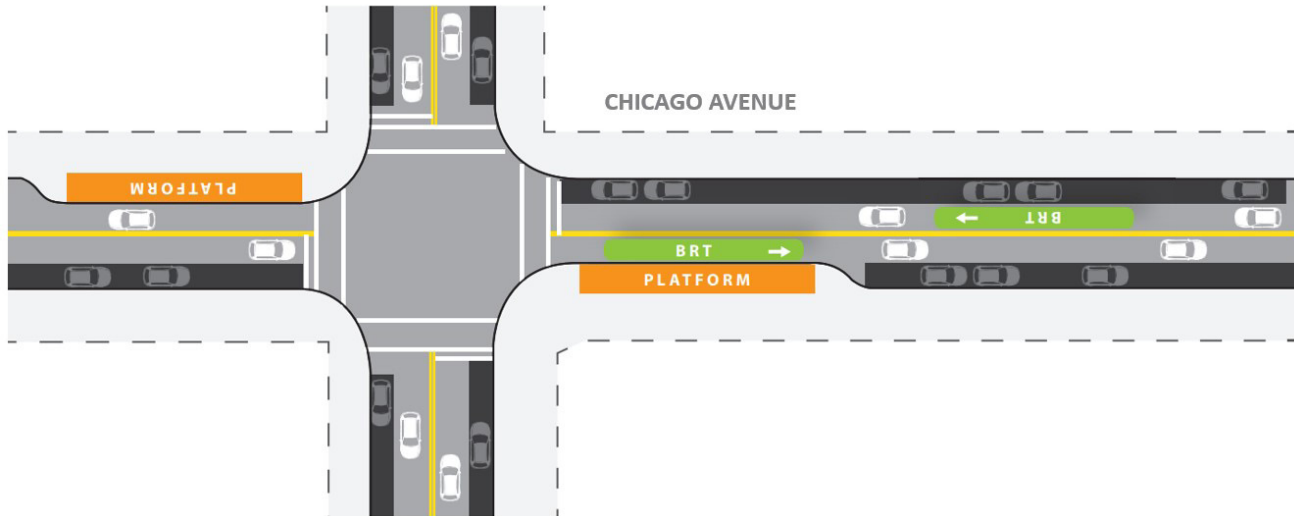
Station location inputs include, but not limited to:

- Targeted half-mile station spacing, on average
- Existing transit ridership at current bus stops
- Community input and feedback
- Connectivity to existing transit network
- Existing land uses
- Street design (e.g., roadway cross-section, bicycle/pedestrian facilities, driveway access medians, etc.)
- Available right-of-way

Platform location: Nearside or farside of the intersection?

A nearside station platform is located just before a roadway intersection. A farside platform is located just after a roadway intersection. Rapid bus operations benefit more from farside platforms. As a result, D Line platforms will be placed farside whenever possible.

Figure 10: Farside platform example



Farside platforms are beneficial because they reduce conflicts between right-turning vehicles and stopped transit vehicles common at nearside stop locations. Farside stations also maximize transit signal priority effectiveness by allowing a bus to activate its priority call to the signal, progress through the intersection, and stop at the farside platform. This reduces scenarios more common to nearside locations when a bus is required to stop twice before moving through an intersection: once to unload and load passengers at the platform itself and again for a red traffic signal after leaving the platform.

The preferred D Line platform location is on the farside of intersections. However, not all platforms are sited farside. Site-specific conditions that may prevent implementation of farside platforms include:

- Existing roadway access points or driveways
- Right-of-way constraints
- Surrounding land uses

Shelter size: Small, medium, large?

Rapid bus stations are equipped with more features than a typical bus shelter to allow for a more comfortable customer experience. Station features will incorporate many elements found at light rail stations, but in a more compact setting adaptable to site-specific conditions. Standard station features include shelters with heat and lighting, security features like a camera and phone, real-time bus arrival information, trash receptacles, and printed maps. A key variable at each station is shelter size: small, medium, or large shelter structures. Basic shelter dimensions are:

- Small shelter: 12' (length) x 5' (width) x 9' (height);
- Medium shelter: 24' x 5' x 9'-12'; and
- Large shelter: 36' x 5' x 9'-12'.

The primary consideration in determining shelter sizes at each platform is existing ridership across the day and at peak times (specifically, the number of boardings) for all routes serving the current location/bus stop. More boardings at an existing stop warrant a larger shelter, with shelters sized to accommodate peak demand based on daily ridership and all-door boarding on three-door, 60-foot buses.

The general boarding guidelines for different shelter sizes are:

- Small shelter: Fewer than 50 boardings per day
- Medium shelter: Between 50 and 200 boardings per day
- Large shelter: More than 200 boardings per day

Specific site conditions may also influence the size of the shelter planned for each location. Shelter size will ultimately be determined through detailed site engineering in the design phase.

See Figures 11-13 for images of small, medium, and large rapid bus shelters.

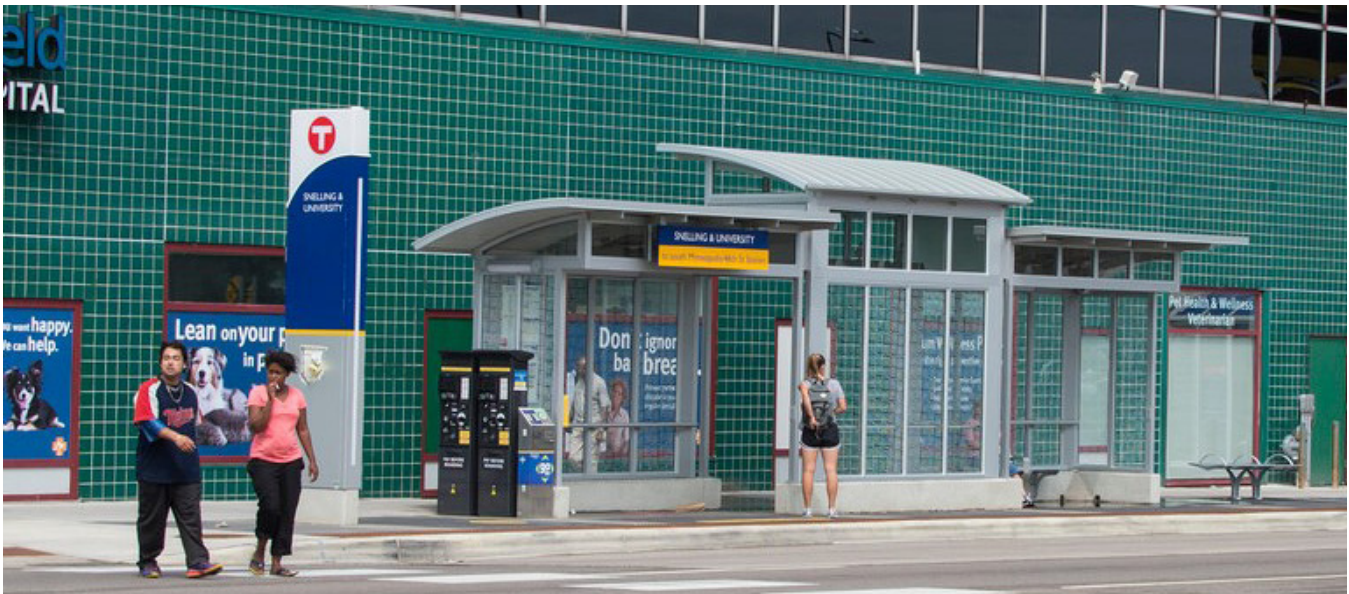
Figure 11: Small shelter on the A Line, Snelling & Dayton station



Figure 12: Medium shelter on the A Line, Snelling & County Road B station



Figure 13: Large shelter on the A Line, Snelling & University station



Curb Bumpouts/Curb Extensions: Will the curb at station platforms be extended?

Platform bumpouts are considered at locations where the area against the curb is currently used for on-street parking or in some cases, turn lanes, to eliminate delay-inducing merging movements. The presence and design of any bicycle facility adjacent to a potential platform can also influence the feasibility of a bumpout. Many existing local bus stops are located in curbside parking lanes or right-turn lanes, causing delay for buses merging back into traffic.

A bumpout platform is a section of widened sidewalk extended from the existing roadway curb to the edge of a through-lane for the length of the platform to provide space for shelters and other station furnishings and allow for a clear boarding area along the curb. Beyond the platform length, this curb extension transitions back to the typical sidewalk width. This is illustrated in Figure 14.

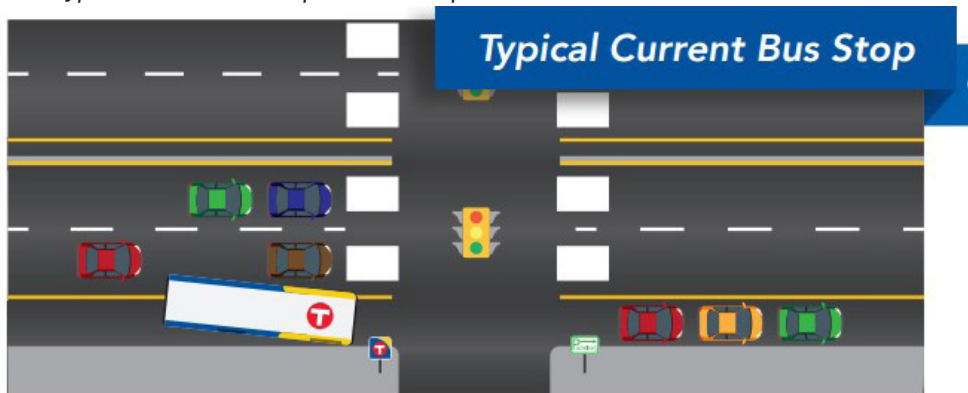
Bumpouts improve overall bus operations by:

- Eliminating the need for buses to merge in and out of traffic to access stations
- Potentially reducing overall bus stop zone length, which may allow on-street parking spaces to be added in space previously used for bus movements
- Providing space for clear and accessible all-door boarding, shelters, and station amenities
- Minimizing conflicts between waiting bus passengers and pedestrians using the sidewalk

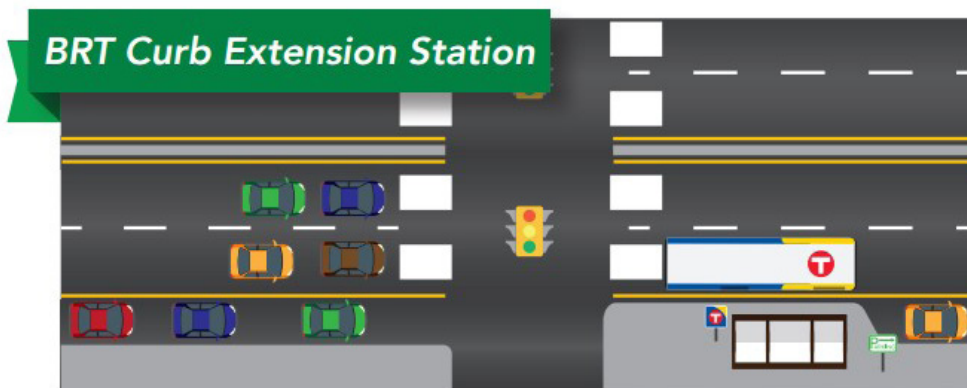
At locations where bumpout platforms are not considered due to lane configurations or absence of on-street parking, the platforms will be adjacent to the existing curbside travel lane without moving the curb.

Under both bumpout and non-bumpout/curbside platform conditions, buses will generally stop in the travel lane and eliminate the need to merge into traffic when leaving stations.

Figure 14: Typical current bus stop versus bumpout



Today, buses stop in the right-turn lane with little space for customer amenities. Merging back into traffic causes delay.



Platform length and height: How long will the platform be? How high will the platform be?

Generally, D Line platforms will be designed for a standard length of 60 feet. A 60-foot platform length can fully accommodate a 60-foot articulated bus, the planned standard bus type for the D Line. Certain constrained conditions, like existing access points and driveways, might prevent a full 60-foot platform from being constructed; however, these situations are avoided wherever possible. In some places, stations may be designed at a longer length to accommodate more than one stopped bus.

Platforms will be designed with a standard of nine-inch curb height to facilitate “near-level boarding.” Near-level boarding substantially reduces the distance between the curb and the floor of the bus, easing vehicle access for passengers with low mobility and enabling faster boarding and alighting of all passengers. Near-level boarding does not eliminate the need for ramps to be deployed to assist passengers using mobility devices. Curb heights of nine inches or lower are compatible with all bus models. Curb height for specific D Line platforms will be finalized within the project’s detailed design phase and can be influenced by variables like area drainage requirements and Americans with Disabilities Act (ADA) standards.

Figure 15: Near-level boarding detail



Near-level boarding is not “level boarding,” where platforms are located at the same level and height as the floor of the bus, at approximately 14 inches. Light rail platforms within the Twin Cities are an example of level-boarding platforms. Level-boarding platforms are not being considered for the D Line due to engineering considerations and the tight space constraints of the corridor; ramping up to a 14-inch curb from a 6-inch sidewalk requires a prohibitively large area. Level boarding also requires that buses slow down considerably upon approaching stations, which can significantly negate the travel time savings benefit that rapid buses may provide. In some places, stations may be designed at a longer length to accommodate more than one stopped bus.

V. Station Plans

The following section contains individual station plans for each of the D Line stations. The plans communicate two core station components: the station intersection and the location of platforms within that intersection. While other anticipated design details are provided for additional context (e.g., curb bumpout information and platform length), these details are conceptual and will be finalized throughout the design phase in 2018 and 2019.

The individual station plans are organized north to south, beginning in Brooklyn Center and ending in Bloomington.

The *D Line Station Plan* identifies 40 stations (77 total platforms) over the approximately 18-mile corridor. Figures 16-19 summarize the recommended station locations at the corridor-wide level, illustrating existing Route 5 ridership and planned station spacing.

Brooklyn Center

[Brooklyn Center Transit Center](#)
[Xerxes & 56th Avenue](#)
[Brooklyn & 51st Avenue](#)

North Minneapolis

[44th Avenue & Penn-Oliver area](#)
[44th Avenue & Humboldt-Girard area](#)
[Fremont & 42nd Avenue](#)
[Fremont & Dowling](#)
[Fremont & 35th Avenue](#)
[Emerson-Fremont & Lowry](#)
[Emerson-Fremont & 26th Avenue](#)
[Emerson-Fremont & West Broadway](#)
[Emerson-Fremont & Plymouth](#)
[7th Street & Bryant](#)
[7th Street & Olson-5th Avenue](#)

Downtown Minneapolis

[Ramp A/7th Street Transit Center](#)
[7th-8th Street & Hennepin](#)
[7th-8th Street & Nicollet](#)
[7th-8th Street & 3rd/4th Avenue](#)
[7th-8th Street & Park](#)

South Minneapolis

[Chicago & 14th Street](#)
[Chicago & Franklin](#)
[Chicago & 24th Street](#)
[Chicago & 26th Street](#)
[Chicago-Lake Transit Center](#)
[Chicago & 34th Street](#)
[Chicago & 38th Street](#)
[Chicago & 42nd Street](#)
[Chicago & 46th Street](#)
[Chicago & 48th Street](#)
[Chicago & 52nd Street](#)
[Chicago & 56th Street](#)
[Portland & 60th Street](#)

Richfield

[Portland & 66th Street](#)
[Portland & 70th Street](#)
[Portland & 73rd Street](#)
[Portland & 77th Street](#)

Bloomington

[American & Portland-Chicago](#)
[American & Bloomington](#)
[American & Thunderbird](#)
[Mall of America Transit Center](#)

Figure 16: Planned D Line stations and existing Route 5 ridership, northern section

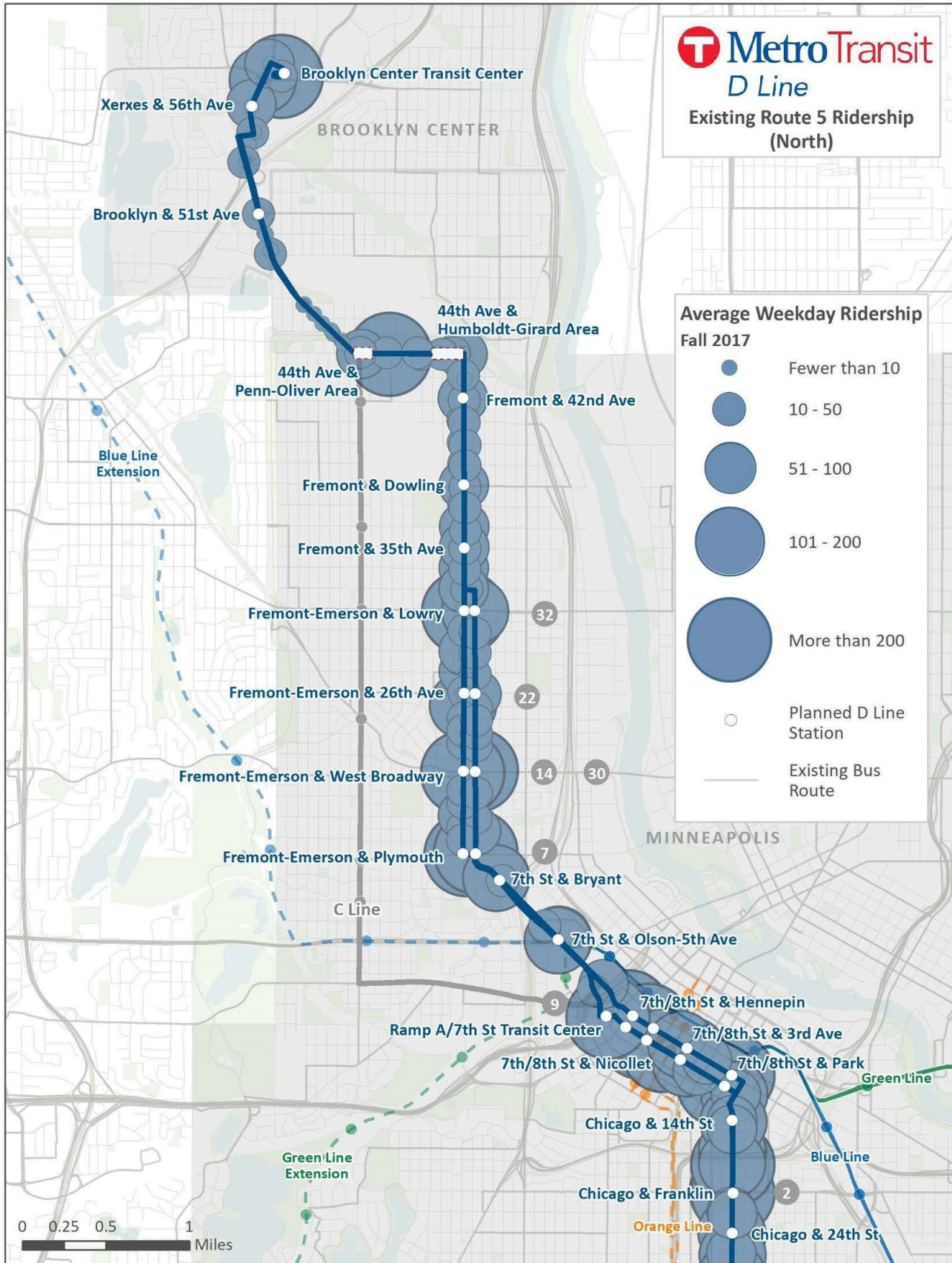


Figure 17: Planned D Line stations and existing Route 5 ridership, southern section

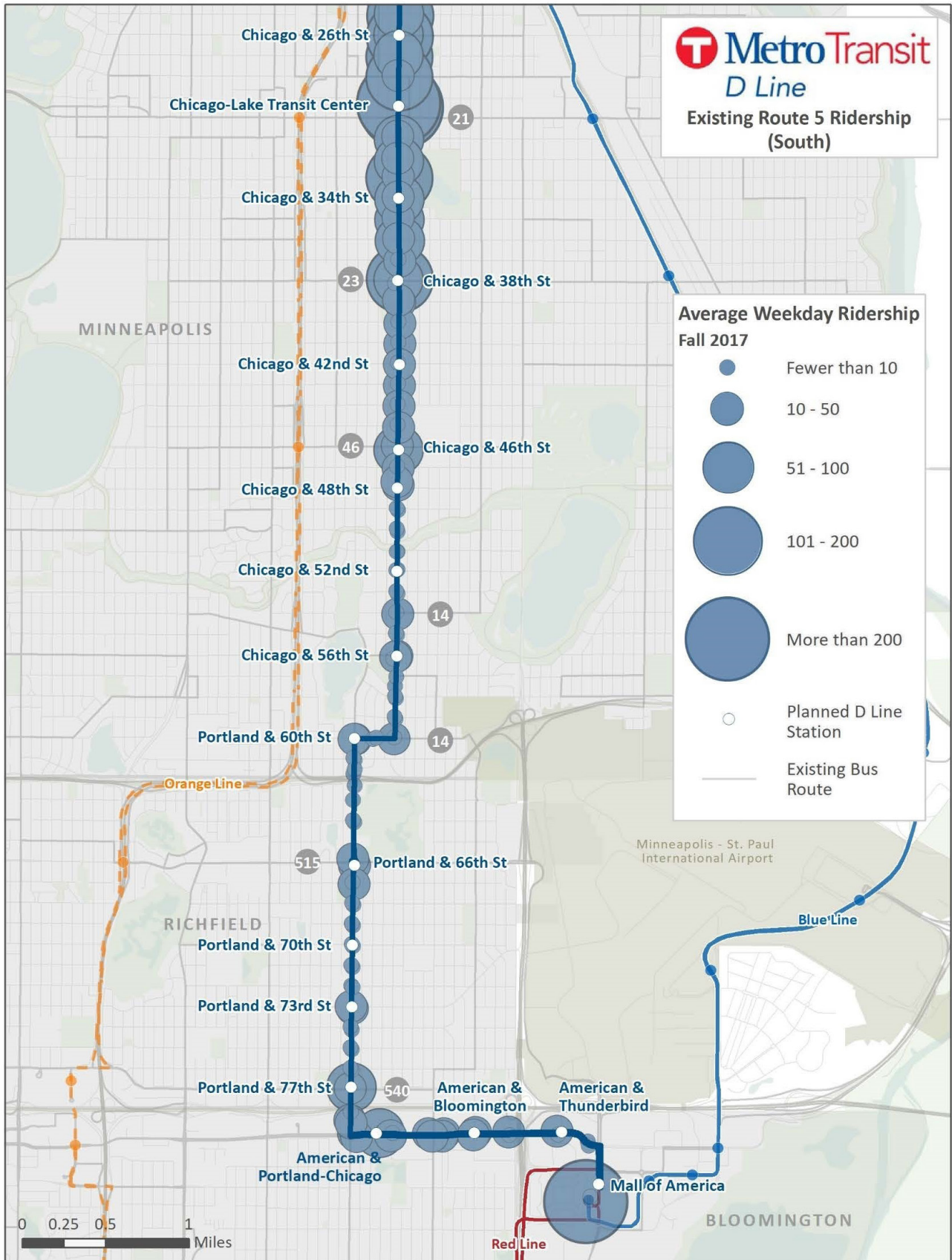


Figure 18: Planned D Line stations and station spacing, northern section

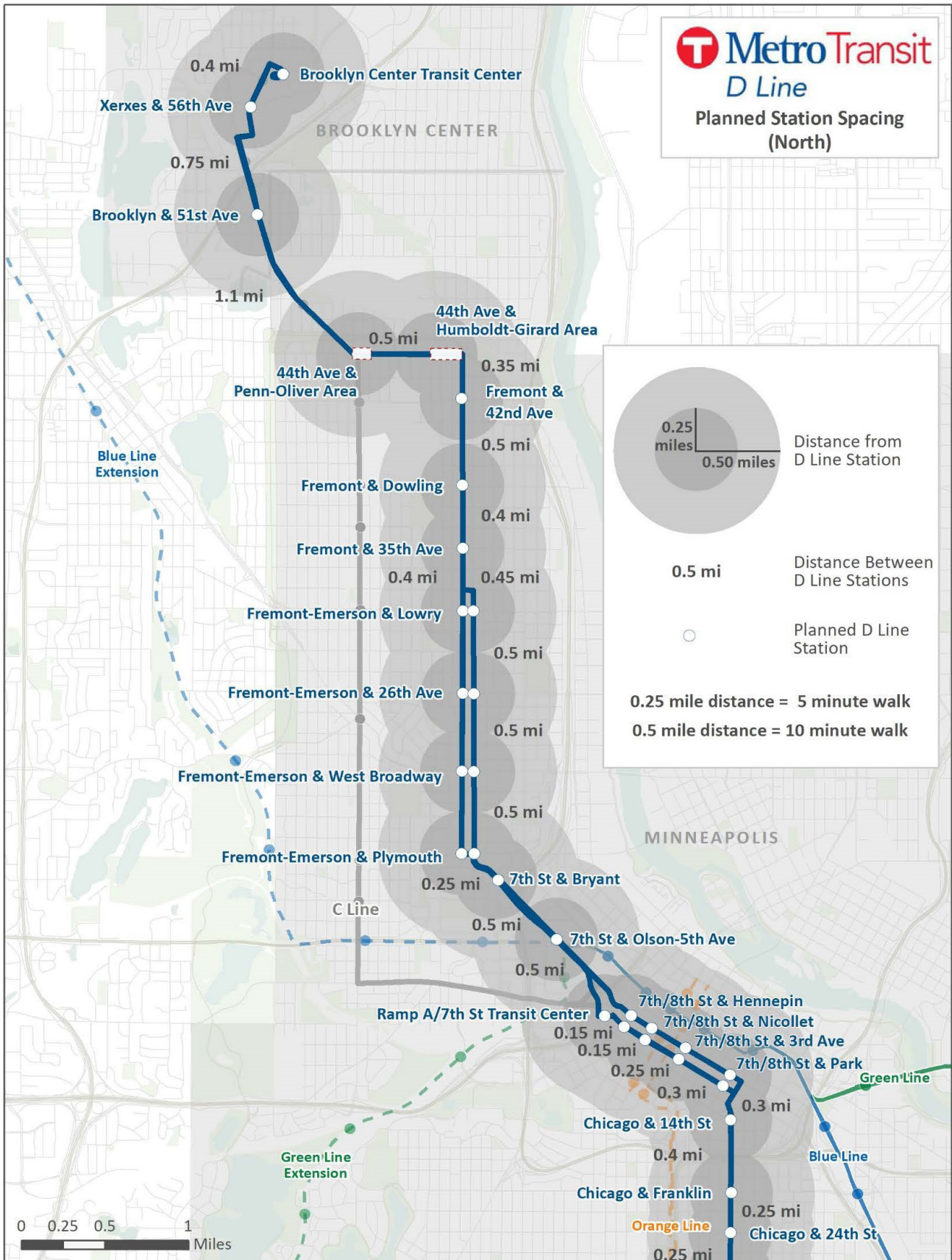


Figure 19: Planned D Line stations and station spacing, southern section

