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# Minneapolis Primary Transit Network

Public Draft

Meyer, Mohaddes Associates
a business unit of Iteris, Inc.

Nelson|Nygaard
consulting associates

Richardson, Richter & Associates, Inc.

SEH Short Elliott Hendrickson Inc.

November 7, 2005

# The Minneapolis Primary Transit Network

## *What is a Primary Transit Network?*

### Introduction

Major corridors throughout the Twin Cities region provide access to the activity centers within the City of Minneapolis. From Saint Paul, Rochester, St. Cloud, Mankato and other surrounding cities, as well as the rural and exurban areas outside of the Twin Cities, expressways and highways carry traffic into and out of Minneapolis. Within the Minneapolis city limits, activity centers and residential communities are connected via a comprehensive street network that accommodates automobiles, buses, freight, and bicycles, along with sidewalks for pedestrians. Light rail also provides important transportation connections within Minneapolis.

Although this transportation network is designed to serve high volumes of travelers in some locations and low volumes in others, several key corridors — wide arterials, freeways, groups of parallel streets, and rail lines — serve as the primary conduits that allow individuals to travel between their community and destinations such as downtown, the University of Minnesota and other activity centers. These primary existing corridors, along with potential future corridors, are the most critical avenues for the movement of goods and people in Minneapolis.

A high proportion of the traveling public make trips along these corridors in automobiles, buses, and light rail. These primary corridors not only get people to their jobs, but also to shopping centers, schools, and other services. Transit services that operate through these primary corridors are the key components of the Primary Transit Network.

### A Definition

The Primary Transit Network (PTN) is a permanent network of all transit lines — regardless of mode or agency — that operates every 15 minutes or better all day for at least 18 hours every day. The PTN can be defined based on performance criteria for five key dimensions of transit quality. These are identified below and discussed in detail in Chapter 5.

- **Frequency.** PTN services run all day at frequencies of 15 minutes or better. A15-minute headway represents the point at which a transit rider no longer needs to consult a schedule to use the service. It also permits transfers to be made rapidly, even without the timing of transit connections. The threshold frequency of 15 minutes is the point at which the benefits of transit tend to grow exponentially.
- **Span.** The PTN runs a minimum 15-minute frequency for at least 18 hours a day, 7 days a week. This is important because the PTN must reduce auto dependence, allowing all types of trips to be accommodated on transit, not just commuting. The service may operate more than 18 hours a day. Reduced frequencies beyond the 18-hour span would not preclude a line from being a PTN service.
- **Speed.** PTN services have an average operating speed of no less than 30% of the speed limit. This operating speed accounts for stops. Thus, the service transports riders more quickly than most of the conventional transit lines in Minneapolis. It is important that transit speed not be measured relative to average auto speeds, because if the PTN is stuck in congestion, the total person-capacity of the transportation network will decline. To increase person capacity, it is critical that average transit

travel speeds approach their theoretical maximum speed. Speed may be the most important single factor since travelers overwhelming tend to choose the fastest means.

- **Reliability.** Permanence and reliability are anchors of the PTN. Actual headways between consecutive buses will exceed scheduled headways by a coefficient of variation not to exceed 0.30. Users who know the schedule can expect the PTN services to operate on schedule.
- **Loading.** Standing loads are acceptable, but crush loads are not. Improved frequencies may be required to alleviate crush loads[1]. Appropriate equipment is used to ensure the comfort of passengers and the efficiency of PTN services.

## Characteristics of a Primary Transit Network

Based on the operating and performance criteria defined above, a PTN is able to accomplish what other transportation modes cannot. Some of the most beneficial characteristics of a PTN include efficiencies and other elements that make it a very attractive means for moving people throughout Minneapolis. As emphasized in the Minneapolis Plan, the city's economic and social vitality are reliant on a comprehensive and balanced transportation system. At a minimum, a PTN should appeal to many rider groups, reduce trips made by automobile, offer highly productive service, and require low passenger subsidies.

### Appeal to Many Rider Groups

Some transit services are targeted to specific populations, such as commute-only services for persons going to work, or dial-a-ride services for seniors or persons with disabilities. Unlike these other services, PTN services are designed to serve the widest range of travelers because they operate reliable service all day at high frequencies. Commuters will use PTN services for travel during rush hour. Seniors will ride midday to access services or to go shopping. Students will rely on PTN services throughout the day to go to classes or job training programs. Theatergoers or other recreational users will ride PTN services late into the evening. At least some critical travel needs for most rider groups are served by PTN services.

### Reduce Person Trips Made by Automobiles by Providing a Competitive Alternative

PTN services are designed to meet the transportation needs of not only transit-dependent persons, but also "choice" riders: individuals who choose to use transit instead of driving their car.

Why would someone choose to use transit if they have a car available? To appeal to a wide array of rider groups, PTN services

- Are sufficiently convenient to access, and are located within a short distance of the highest densities in the city,
- Offer travel times that are competitive with or better than using a private automobile, including time to access transit, ride on transit, and travel from the transit terminal to the destination,
- Charge fares that are competitive with or lower than the cost of driving alone (vehicle costs, parking charges, gasoline, insurance, tolls, and other costs associated with driving),

[1] Crush loads are generally defined as loads that exceed the seated and comfortable standing capacity of a vehicle.

- Are reliable, operating a single type of equipment on a consistent schedule,
- Offer long service hours to allow travel at early and late hours, and
- Offer the best frequencies, providing flexibility for travelers and short wait times.

**Achieve Maximum Productivity (Passengers/Unit of Service)**

Because the PTN meets such a wide range of the travel needs for most population segments, PTN services would have the highest ridership of all of the services in Minneapolis. The location, frequency, reliability, and convenience of these services means that these are high-capacity transit services that attract a high volume of riders. Compared with other transit services, the services that comprise the PTN have a much higher number of passengers per hour or per mile. By focusing on maximizing productivity, the PTN addresses the markets where transit can have the greatest impact, rather than trying to serve everyone in the region.

**Require the Lowest Operating Subsidies per Passenger**

A full-size bus averaging 40 passengers per hour costs about the same to operate as a full-size bus with only four passengers per hour. For illustrative purposes only, if Metro Transit is collecting an average of $1.50 per rider, the bus with 40 passengers collects $60.00 in one hour, while the bus with four riders nets only $6.00.

PTN services attract high volumes of riders. High ridership volumes require lower operating subsidies, meaning the transit system is spending much less per passenger on the PTN than on other transit services in Minneapolis.

## *Primary Transit Network Services*

Two major transit service strategies define the PTN: (1) Rapid Transit, and (2) Primary Local.

The most significant differences between these are in stop spacing and the type of roadway/track/guideway along which vehicles operate. For example, Rapid Transit typically has major, station-like stops every ¼ to one mile. Primary Local has closer stop spacing. Rapid Transit is typically the most productive of all, because stops every ¼-to-one mile optimize the tradeoff between speed (which benefits from fewer stops) and access (which benefits from more).

### Rapid Transit

This service offers the speed, frequency, and reliability usually associated with rail transit, although the service can be provided with specialized rubber tired vehicles operating in the roadway. Rapid Transit provides frequent service to widely spaced stops,[2] so it fits a pattern of development that clusters in major nodes along a corridor, rather than a linear pattern. Rapid Transit typically requires an exclusive right-of-way wherever congestion would otherwise threaten reliability.

[2] Rapid transit stop spacing usually averages between one and two miles, but is closer in denser areas. Spacing is rarely closer than ¼ mile, and then only in the densest urban cores.

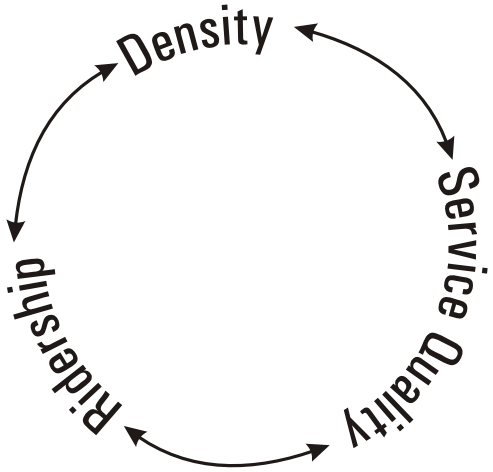
Rapid Transit explicitly includes limited-stop bus services, if they can be operated with sufficient speed and reliability, in addition to LRT. High-frequency busway services, such as those proposed on I-35W, could also meet this definition.

### Primary Local

These local services, constituting most of the service in the Primary Transit Network, cover corridors where densities are high (typically at least seven dwelling units/acre, with fifteen or more preferred) and at major activity centers. Although Primary Local service can be implemented utilizing light rail or streetcar vehicles, most Primary Local service would be bus service. Improved bus technology, including diesel-electric hybrid buses and fast fare collection systems, can be elements of this strategy. Unlike most Rapid Transit services, Primary Locals do not typically have a dedicated right-of-way, but speed-protection strategies and improved stop amenities can be used to maintain the permanence and reliability of these services. Primary Locals would extend across much of the Minneapolis area, but would be concentrated in the densest urban portions of the city.

## *What Makes the Primary Transit Network Function?*

As a strategy for moving people in Minneapolis, the PTN works because it is designed to serve a large share of the city's population with a minimum of line miles, operating in the densest areas (and areas that will further densify), and it provides excellent frequencies and service spans. The PTN's value, as well as its success, relies on a three-way interdependence among (1) density, (2) service quality and (3) ridership.




### Density

The City of Minneapolis should encourage density and other transit-friendly development along the PTN, and discourage it elsewhere. The PTN corridors should also carry building orientation and pedestrian accessibility requirements for all new development, so that the development that occurs is convenient to the transit rider. In general, the PTN should be a focal point for the entire

arsenal of transit-oriented development practices, to maximize the value of the investment that the agency has already made in these corridors.

All new transit-dependent land uses, such as social service offices, should be located on the PTN as a matter of policy. Frequently, social service agencies, community colleges, and clinics locate on the cheapest available land, which usually has poor access. While this may optimize costs for the agency in question, it forces the transit agency to run an inefficient service to reach a poorly sited facility. In effect, one agency is simply dumping its costs on another.

## Service Quality

In order for the PTN to attract high numbers of riders and to justify the increased densities adjacent to it, the service itself must be of a very high quality. The service reliability and quality characteristics are described earlier in this chapter, but include convenience of stop locations; travel times that are competitive with or better than private automobiles; reasonable fares; excellent reliability; a long service span; and high-frequency service. In addition to these service characteristics, PTN services should have enhanced amenities that reflect their especially high ridership potential, and their special role in the network.

A report produced by the Transportation Research Board (TRB) for the FTA in 1999 examined the influence of user amenities on ridership and ways for local transit providers to select the correct amenities to meet the needs of their ridership base. Improved amenities were found to create a more positive view of transit services and attract new transit riders. However, the functionality of amenities was as important as the presence of the amenities. Poorly designed or unneeded amenities were seen more as a waste of money than as system improvements. The type of amenities most likely to attract riders varies depending upon the type of rider utilizing the service, the length of wait for vehicles, average passenger trip length, and the environmental characteristics of the region.[3]

Rail in Minneapolis already has significant service amenities that buses do not have, including dedicated stations with comfortable waiting areas, extensive public information, etc. Buses can offer similar amenity, if priority is given to:

- low-floor, high-capacity coaches (or any new coach technologies that expedite comfort or operations);
- premium shelters with many of the amenities associated with rail stations;
- information features, including real-time information in shelters (the number of minutes until the next bus comes)
- informational displays within buses (such as the time and the next stop.);

Investing in a PTN with the desired service characteristics and premium amenities requires an understanding that the potential ridership exists and will be attracted to the service. It also

[3] Transit Cooperative Research Board, Federal Transit Administration and Project For Public Spaces, Inc., Multisystems, Inc., "The Role of Transit Amenities and Vehicle Characteristics in Building Transit Ridership", National Academy Press, Washington, D.C., 1999.

requires the land uses and population/employment densities that would justify this investment to be in place. As a result, the mix of characteristics and amenities that make the PTN very desirable will attract riders and investment adjacent to the PTN.

## Ridership

With permanent, reliable, high-frequency service connecting the densest activity centers and serving the corridors with the highest intensity of uses in Minneapolis, the PTN will attract riders. High ridership in high-density areas is a justification for investment in transit and the level of amenity required for the PTN to be successful and attract more riders.

Nevertheless, the City of Minneapolis cannot make the investment in the PTN unless assurances can be made that the ridership will be there. Automobiles will remain the primary travel mode for the foreseeable future; getting people to leave their automobiles at home and opt for transit should be the policy focus that will ultimately encourage ridership on the PTN and throughout the city's transit network. Land use policies that encourage higher densities along the PTN, paired with investment in the PTN, ultimately will allow Minneapolis to move more people more efficiently.

## *Moving Minneapolis Forward*

In large cities such as Minneapolis, transit quality is a key criterion for land development; land use is a key criterion for transit service. The discussion in the previous section illustrates the need for policies that encourage the consideration of both land use and transit service: that quality transit service will be available when land use and street design assume good transit-oriented forms.

To maximize transit's mode share, Minneapolis should focus on the highest density corridors and increase ridership there. Establishment of — and investment in — the PTN is the recommended technique for accomplishing this. Whether formed by light rail, streetcar or bus service, the PTN becomes a foundational element of Minneapolis' infrastructure.

Additional bus services would be needed to support the PTN. Just as they currently do, some buses would continue to operate through single-family neighborhoods and in lower-density employment and shopping districts. This local coverage is required where lifeline transportation needs exist, in areas inaccessible to the more streamlined PTN services. Local coverage would connect with the PTN with optimal schedule coordination, so that the local service can be used for both local and regional trips.

Looking at a map of all of the existing transit lines in Minneapolis, one notices a web of transit services reaching from the center of downtown to the edge of the city's limits, and then beyond to other cities and suburbs. Considering all of the transit lines, the PTN may represent only about 30 percent of the route miles, but may serve as many as 70 percent of the city's transit riders. The PTN would serve most of the areas of rapid residential growth, so that the percentage of residents with access to the network would continue to rise.

## *Role of the Transportation Policy Plan*

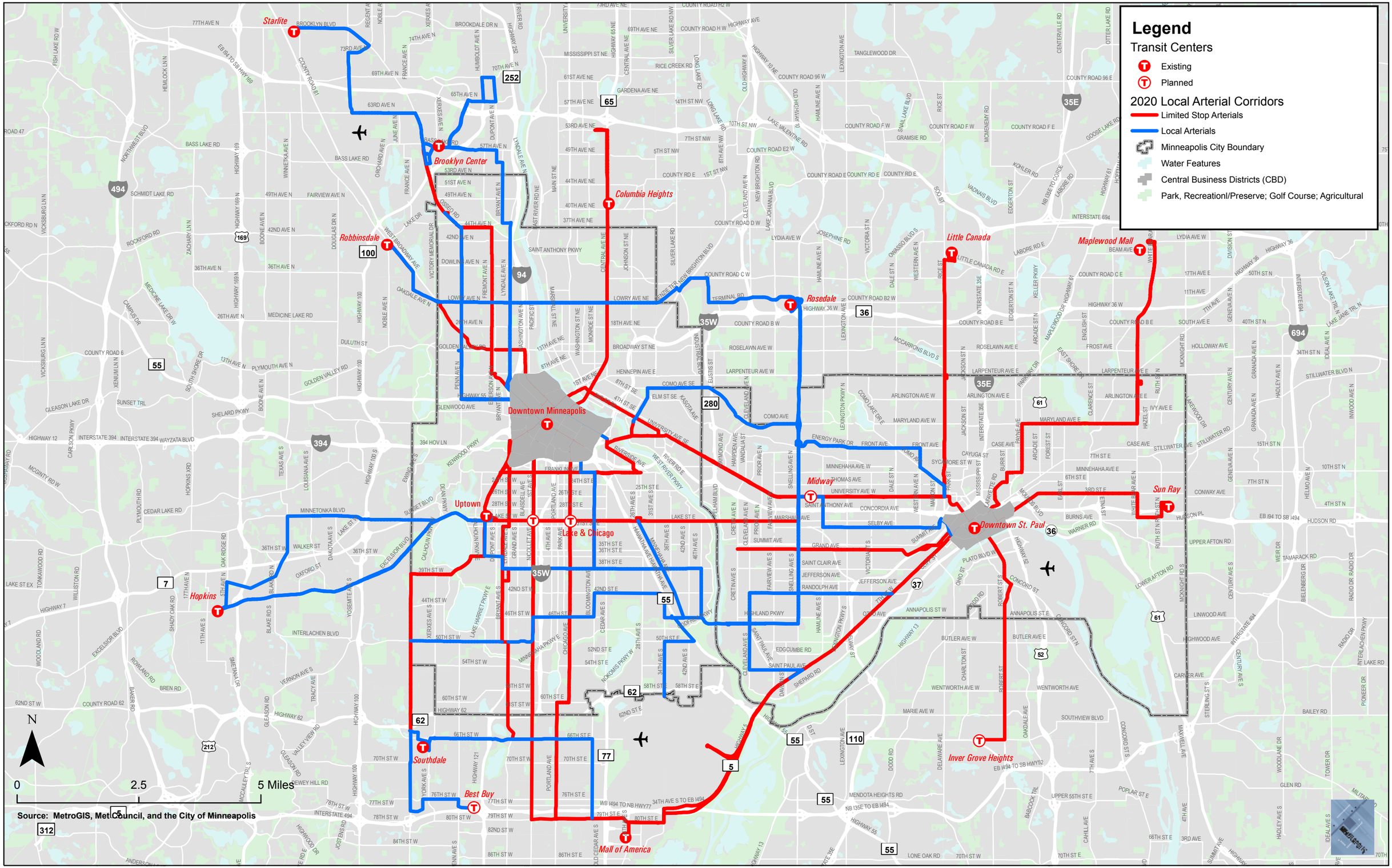
Much of the work of defining the PTN has been done already, under another name. The 2030 Transportation Policy Plan produced a policy transit network, called the "Local Arterial Network", that is very similar to the PTN. Figures 1 shows this network in the region and Figure 2 zooms into Minneapolis.

It is entirely appropriate to use this network as a starting point for defining the PTN, because it was designed on almost exactly the same principles:

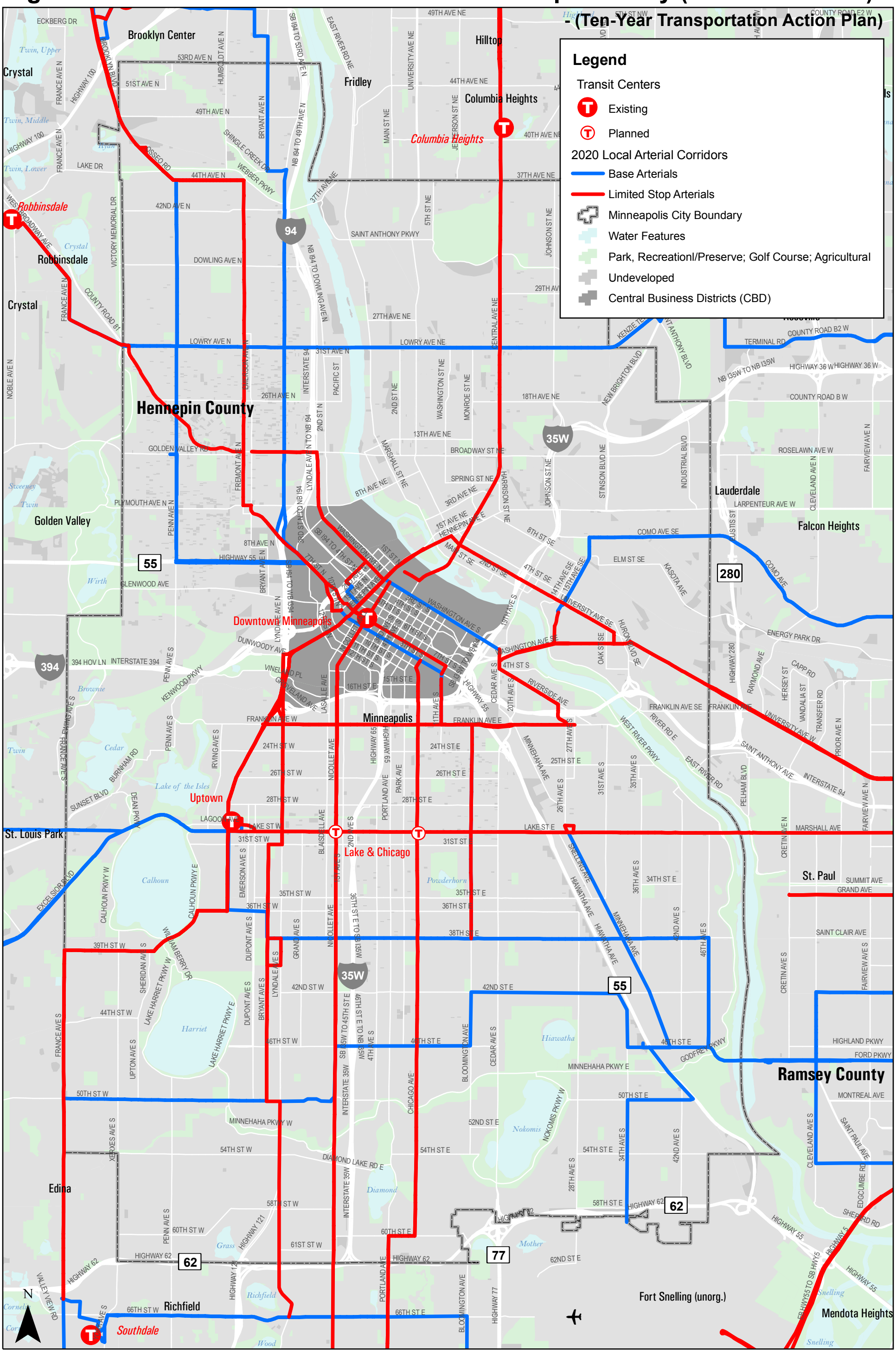
- It follows the prevailing patterns of density, and is most concentrated where existing development is most concentrated, in the triangle bounded by Hennepin, Lake, and Hiawatha.
- It serves all of the major commercial nodes in the city, and a vast majority of the dense apartments.
- It appears to serve a majority of the population directly, because of its focus on dense areas.
- It contains minimal duplication and overlap, though this is one area where some adjustments are recommended below.
- It mostly follows arterial streets where the physical infrastructure exists to support bus service, and where there is some potential to achieve the speed and reliability that the PTN requires.

The proposed Minneapolis PTN does differ from the TPP network in several details, and these are described in detail below. However, there is no reason to reinvent the network from scratch. Most of the corridors identified in the TPP network are the obvious priorities for a Minneapolis PTN. A PTN that was developed "from scratch" would look exactly the same, except for the revisions described below.

# Figure 1: 2020 Local Arterial Corridors-Twin Cities Metropolitan Area (From 2004 TPP) - (Ten-Year Transportation Action Plan)



# Figure 2: 2020 Local Arterial Corridors-Minneapolis Only (From 2004 TPP) - (Ten-Year Transportation Action Plan)




Source: MetroGIS, Met Council, and the City of Minneapolis

## *Limited Stop vs. Extremely Frequent Local*

The TPP network makes a distinction between "Limited" and "Local" corridors. In most cases, "Limited" refers to relatively long corridors that might benefit from Limited-stop service. Presumably, the intention is for these corridors to have both frequent service making all stops and frequent service making limited stops.

For the PTN, we recommend a slightly different distinction. Limited-stop may well be appropriate on some of these corridors, but at this level of analysis, we recommend on focusing first on pure frequency. In many cases, it may be more appropriate to improve frequencies to as good as 7 minutes before overlaying limited-stop service. The reason for this is that with 7 minute service, the bus comes an average of 3.5 minutes sooner than with 15 minute service[4]. Over the relatively short travel distances in the city, limited-stop service is unlikely to save enough time to make up for that difference. We might add that in inclement weather, it will generally be preferable for the customer to be on the bus than on the street.

Again, limited-stop service will have some relevance on longer corridors. In some cases, too, Bus Rapid Transit projects will provide a limited-stop option. This is already proposed for a Northwest corridor and on I-35W south, and could become appropriate for other long corridors within the city, such as Nicollet and Chicago.

To maintain a focus on the underlying value of the PTN, however, we recommend leaving the question of limited-stop vs very-frequent service to a more detailed level of planning. The key points for this study are that the corridors marked red on the map …

- … have the highest frequency of service.
- … are also the top priority for service improvement up to the PTN level, and for PTN-related amenities.
- … would be evaluated for limited-stop service as ridership warrants.

## *Assessing Adequate Density and Access for a PTN Line*

### Density Threshold

A PTN corridor should have an aggregate density of at least 25 residents and jobs per acre over the entire ¼ mile band on either side of the line. In purely residential areas, this corresponds to a housing density of 10 dwelling units per acre (because current average household size for the City of Minneapolis is about 2.5).

This measure will do for a citywide assessment. However, the City and Metro Transit are encouraged to add nuance where the data exist. For example:

[4] Average wait time is half of the headway. So the difference between average waits under 7 minute vs. 15 minute frequencies is (15/2 – 7/2) = 3.5 minutes

- This rough standard uses jobs as a proxy for all kinds of nonhome activity, but it is not sensitive to the very different trip generation rates of different kinds of employers. Clearly, retail uses have a higher trip generation rate per employee than industrial uses. These could be applied so that some activity uses score higher than others in terms of trip generation.
- When considering planned development of a particular density, household size assumptions can be adjusted based on the type of the development and the expected demographics of its customers. Neighborhood-level variations in household size could also be taken into account, rather than applying a citywide figure.

## Coverage Area Restrictions

It will be easy to assess the density within ¼ mile air distance of a line, but this will be misleading in cases where there are significant obstacles or other factors that limit demand. Two of these should be taken into account:

- **Pedestrian barriers.** Freeways, railways, or waterways obstruct pedestrian access, and therefore limit the catchment area of the line. In general, PTN lines are justified by a level of density over the area within ¼ mile walk of the line. Pedestrian barriers reduce this area, and therefore require a proportionally higher density to compensate for the area within ¼ mile that produces no riders.
- **Lines too close together.** Ideally, parallel PTN lines are ½ mile apart, so that the entire area is within ¼ mile of a line but nobody is within ¼ mile of two lines. Where parallel lines have overlapping coverage areas, they are essentially competing for the same customers. In effect, the coverage area of a PTN line should exclude areas that are also within walking distance of another line, especially a higher-ranking one in terms of these categories. *In downtown areas only, the walking distance standard is often reduced to 1/8 mile – so that parallel lines are ideally ¼ mile apart -- because the travel distances are so short.* This issue is discussed in more detail in the Downtown Circulation Concept report. Note that even when this reduced standard is used in a downtown core, parallel lines that are only 1-2 blocks apart do not count as unique PTN services, because their markets overlap more than they differ.

## Anchoring

An exception to the duplication rule occurs at major nodes along the line where many corridors converge on one point, and especially where lines end. These points, called anchors, are an important part of the performance of a corridor.

The capacity along a PTN line is constant, and must be set to serve the busiest point on the line. On a radial line, this point is typically just outside downtown. Further out on a line, demand is lower, so seats will be empty. If there is no major destination on the outer end of the line, most seats will be empty on the outermost part on the line, and this inefficiency will be more or less permanent.

Anchoring is a way of making use of this unused capacity. PTN lines should always end at a large destination, called an *anchor*, so that there is demand for the service all the way to the end of the line. Most PTN corridors are already designed around this principle. For example, Northwest Minneapolis corridors generally end at either Robbinsdale or at Brookdale in

Brooklyn Center, which are both major destinations and transfer points for trips further into the suburban area. The Chicago Avenue corridor ends at Mall of America for the same reason. Many east-west corridors flow through to downtown Saint Paul, which provides a major destination at the far end of the line.

Anchoring also creates a win-win relationship between Minneapolis and the inner-ring suburbs where anchors tend to be located,[5] and also with St. Paul. The Minneapolis market helps to support higher levels of service to the anchor points than these suburbs could justify themselves. At the same time, the suburban anchors raise the overall performance of these crucial Primary corridors, thereby supporting higher levels of service along each entire line. Any system of branding, of course, should extend beyond city boundaries to include entire corridors out to their logical anchor points.

## Summary of Density Threshold

A rule that incorporates all the issues outlined above would have this form:

- Identify the area within ¼ mile air distance of the line. Call it $A_{AIR}$
- Identify the area within ¼ mile walk distance of the line, and not within a shorter walk distance of a parallel PTN line. Call this area $A_{WALK}$

Then, the aggregate density over area $A_{WALK}$ needs to be:

$$(25 \text{ persons or jobs per acre}) \times (A_{AIR} / A_{WALK})$$

In other words, the density target must be factored upward to reflect the degree to which the walk-access area is smaller than the air-access area.

At anchors (end-of-line points), a different threshold may optionally be used:

- Identify the area within ¼ mile radius (air distance) of the anchor centroid. Call this $B_{AIR}$
- Identify the area within ¼ mile radius (walk distance) of the centroid. In this case, do NOT exclude areas within a shorter walk of other PTN lines. Call this area $B_{WALK}$

Then, the aggregate density over area $B_{WALK}$ needs to be:

$$(50 \text{ persons or jobs per acre}) \times (B_{AIR} / B_{WALK})$$

Basically, this means that anchors must be held to a higher standard, because the ridership on the transit vehicle at the end of the line depends entirely on what can be generated at that location.

[5] In addition to Saint Paul, there are existing or potential anchor points in Roseville, Columbia Heights, Brooklyn Center, Robbinsdale, St. Louis Park, Edina, and Bloomington. (The PTN mostly extends across Richfield rather than ending there.) Over time, some PTN lines are likely to continue to outer-ring suburban anchors such as Northtown Mall.

By contrast, mid-line points need to contribute ridership, but not all of the ridership, since at these points there are also passengers riding between other points on the line. Major suburban shopping malls will pass this standard easily, as will downtown, Uptown, the University area, and possibly other nodes within the city as well, such as NE Mpls (Hennepin/University), Lake/Minnehaha, and Cedar/Riverside.

Any assessment of PTN corridors should of course extend beyond the city limits to the next logical anchor, which is typically a shopping mall or other major node in an inner-ring suburb. In the St Paul direction only, PTN corridors can be assessed just to the city limits, since in most cases corridors continue with comparable density on into St Paul, and end at downtown St Paul, which is an adequate anchor.

## *Definite, Recommended, and Candidate PTN*

How do we phase in a PTN line? Here, the crucial question is for each corridor is: "Is the density already there to support a PTN line, or is more redevelopment needed?" If more redevelopment is needed, it is critical to define the corridor now, so that planners and developers know where they can take high-quality service for granted. However, corridors that are still being developed obviously have a lower priority for infrastructure, in the short term, compared to corridors that are already fully developed to high density.

For this reason, we divide the PTN into three tiers of priority.

- **Definite PTN.** Already densely developed. Most of these corridors already have service at least every 15 minutes all day, though some are weaker evenings and weekends. Upgrading service levels to an adequate frequency and span should be the top priority. These are also the logical first-priority corridors for all other activities that enhance and protect the PTN, from speed protections to stop amenities. Corridors that appear logical for streetcars in the short term are also all in this category.
- **Recommended PTN.** These corridors clearly will reach an adequate level of development to support a PTN line, and should be the next priority for improvement.
- **Candidate PTN.** These corridors have elements of a strong PTN corridor, but they also have some significant obstacle that will need to be overcome, or compensated for through even greater density, in order to produce an adequate transit market. Common obstacles in Minneapolis include freeways (e.g., I-35W South and I-94 North) and railroad tracks (e.g., in between Central NE and University NE).

In planning and development terms, the Definite and Recommended PTN are the network where the City and Metro Transit should commit to full PTN implementation. The two categories simply indicate different levels of phasing within that commitment. The Candidate PTN require focused work to determine if a PTN line can be created that will have an adequate market. This work should be done relatively soon, so that these "gray-area" lines can be either updated or removed.

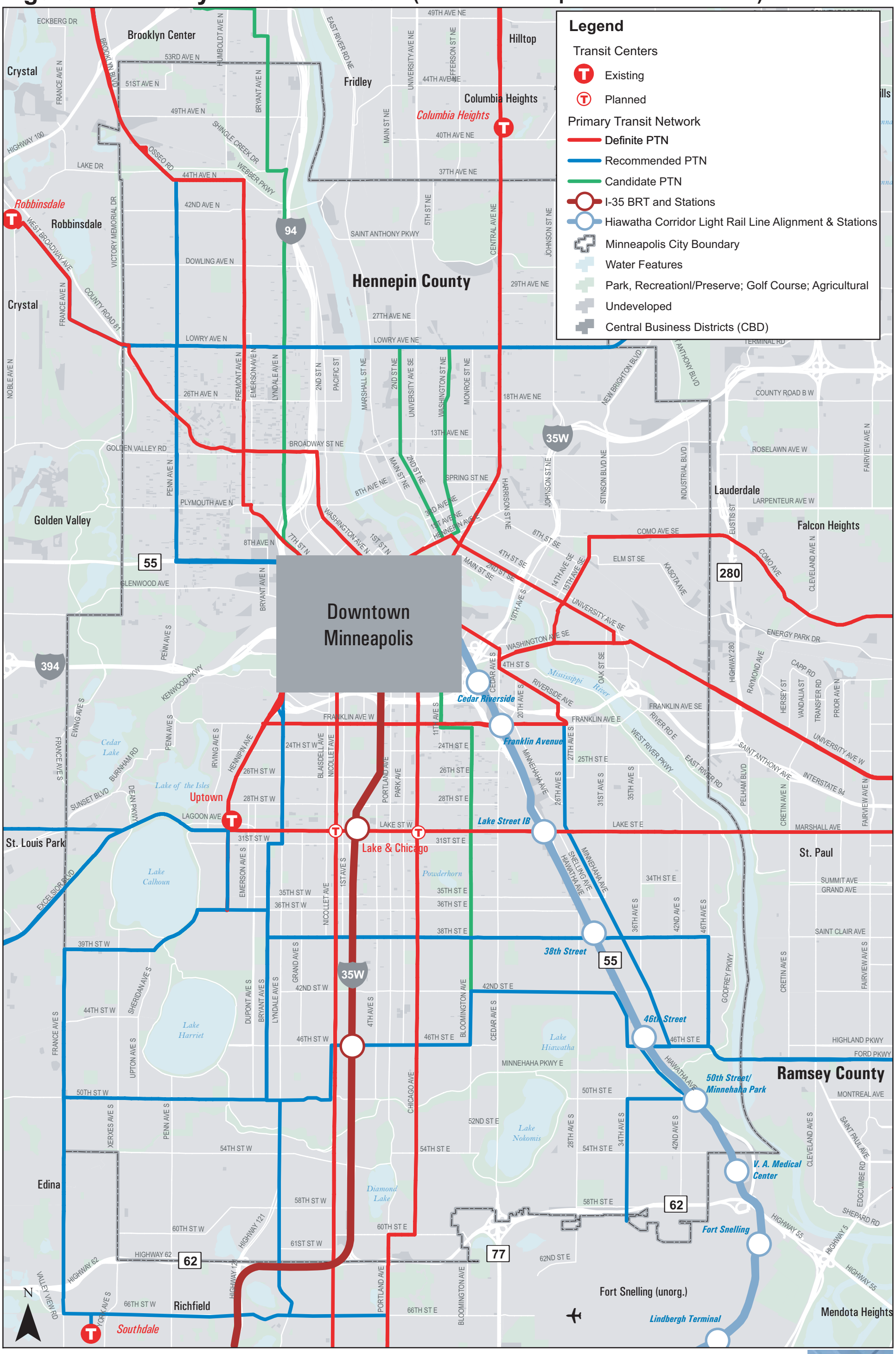
## *From the TPP Network to the PTN*

Figure 3 shows the proposed PTN. It resembles the TPP network, but these changes have been made, consistent with the principles outlined above.

- Most Limited corridors in the TPP appear here as Definite corridors.
- Most Local corridors in the TPP appear here as Recommended corridors.
- Corridors that have significant barriers to access or duplicative coverage, are sometimes demoted, depending on the apparent severity of the limitation. This creates the Candidate category, which consists of lines from the TPP network where these barriers or duplications appear to be a significant issue. Candidate corridors are:
    - Lyndale/Bryant N. (Too close to Fremont, with coverage area cut off by freeway)
    - Bloomington Av S to 42nd (May be too close to Chicago).
    - 2nd and Washington Sts NE. (Existing development doesn't provide a reason to prefer one over the other, and they are too close together to have both. Further work is needed in context of local plans.)
- In a few cases, connective segments have been added to complete a logical corridor (26th Ave SE between Franklin and Lake, Bloomington Av between 38th and 42nd)

The PTN map presented here need not be the last word. However, adjustments to it should reflect a consistent citywide policy, rather than just lobbying from different neighborhoods. A key point of this study is that only by applying the same standards citywide can the City develop a transit network, and set of priorities, that is defensible and can be sustained for the long term.

# Figure 3: Primary Transit Network (Ten-Year Transportation Action Plan)




Source: MetroGIS, Met Council, and the City of Minneapolis

Nelson|Nygaard consulting associates

## Next Steps

The Primary Transit Network is the place where the city and Metro Transit will set the highest standards for the key quality indicators of transit service:

- Frequency
- Span
- Speed
- Reliability
- Capacity

The next step will be to refine those standards. For Frequency and Span, a standard has already been suggested: service every 15 minutes or better, 18 hours a day. Standards will need to be refined for the other variables.

We recommend putting most of the early effort into setting a target for transit operating speed, since this standard more than any other will drive the physical improvements on which Metro Transit and the City will need to work together. A next step of this study element will analyze current speeds against the automobile speed limit, suggest a standard for transit operating speed in terms of percentage of speed limit, and then develop tools for monitoring. Standards for Reliability (standard deviation of frequency) and Capacity (incidences of overloading or pass-ups) will also be developed at this stage.