

## CHAPTER 3: TRANSIT SERVICE PLANNING OVERVIEW

### A. Existing Conditions

#### 1. Types of Transit

There are several types of public transit services available or under consideration in the Twin Cities. More information about the types of transit is available in Chapter 6 of the 2040 Transportation Policy Plan.

Local bus routes serve a variety of purposes and form the basic structure of the regular-route bus system. They usually operate on city streets in both the urban core and in suburban areas throughout the day, stopping every one to two blocks. Streetcars are a type of local route, stopping every one to two blocks and focusing primarily on economic development. Both Minneapolis and St. Paul are considering adding streetcars. Metro Transit operates 58 urban and suburban local bus routes.

Commuter and Express bus service operates primarily during rush hours (6-9 a.m. and 3-6:30 p.m.), connecting residential areas with the region's major employment sites. These routes often operate non-stop on the highway and serve only the most common work start and end times. Metro Transit operates 64 commuter and express routes.

Bus Rapid Transit (BRT) uses buses while incorporating many of the premium characteristics of rail. There are two types of BRT in operation or under considerations: Arterial and Highway BRT.

- Arterial BRT is an all-day, frequent service providing faster service and a better customer experience in corridors with strong existing local service. Stations are spaced farther apart than stops on local routes, every quarter to half mile. The region's first Arterial BRT line, the A Line, is scheduled to begin operating on Snelling Avenue in late 2015.
- Highway BRT provides frequent, all-day service to major destinations near highways and spaced farther apart throughout the region, making it difficult to connect them using local service. These high-capacity services have stations every half-mile to mile. They generally operate on limited access roadways where vehicles can use transit advantages such as bus-only shoulders and MnPass lanes. The METRO Red Line is the region's first Highway BRT.

Light Rail Transit (LRT) has stations every half-mile to mile and are also high capacity services. LRT operates all-day, frequent service connecting dense employment and population centers. It operates on tracks primarily in an exclusive right-of-way using vehicles powered by overhead electrical wires. Metro Transit currently operates two LRT lines, the METRO Blue and Green lines.

Commuter rail is an express service that focuses on bringing rush hour commuters downtown from distant population centers. Service typically operates on existing freight rail tracks. Lines are generally at

least 20 miles in length and stations are spaced at least five miles apart. Metro Transit operates one commuter rail line, the Northstar Line.

Dial-A-Ride service is available in places where fixed routes do not operate. This is a shared ride system requiring riders to reserve a trip in advance. The path each vehicle travels changes daily depending on demand. The Met Council contracts with local governments and private companies to provide this county-based service, called Transit Link.

Expansion of local and commuter and express routes are included in the SIP. The growth of Arterial BRT, Highway BRT and LRT are the subject of separate planning studies.

## **2. Existing Network**

In 2014 Metro Transit provided 84.5 million rides on 132 routes in 90 cities in seven counties. Eighty percent of those trips were on buses (67.8 million trips) and 20 percent were on light rail and commuter rail (16.7 million trips). There were nearly 225,000 average weekday boardings on buses and 65,000 rides taken on light rail and commuter rail.

### **Service levels and ridership at the end of 2014:**

- METRO Blue Line LRT – 225 weekday train trips and nearly 28,000 average daily rides
- METRO Green Line – 232 weekday train trips and almost 35,000 average daily rides
- METRO Red Line – 130 weekday trips and over 900 average daily rides
- Northstar Line – 12 weekday trips and more than 2,500 average daily rides
- 64 Commuter and Express routes – 1200 weekday bus trips and nearly 34,000 average daily rides. These routes are supported by 67 park-and-ride facilities with 15,000 parking spaces
- 58 Urban Local routes – 5000 weekday bus trips, over 180,000 average daily rides
- 7 Suburban Local routes – 400 weekday bus trips and almost 7400 average daily rides

Metro Transit has a fleet of 900 buses, 68 light-rail vehicles, 18 commuter rail cars and six locomotives. The adopted 2015 operating budget was \$404.8 million, of which about 50 percent is funded by the Motor Vehicle Sales Tax and 25 percent is funded by passenger fares.

Metro Transit's service area is shown in Appendix A.

## **3. Customer Overview**

Onboard surveys provide insight on Metro Transit's customers and reveal a variety of reasons that local and express customers ride the bus. Figure 2 and Figure 3 below show the main reasons riders use bus service and their primary trip purposes. Responses are from the 2014 Metro Transit Rider Survey.

Most passengers are riding local and express routes to work or school. These trips are relatively easy to serve with transit, since they include predictable trip times and destinations and have large concentrations of people traveling to one place.

However, most trips that people make (in general, not just specifically trips on transit) are not to and from work. Improving transit service for these trips is important to expand our customer base and to provide basic mobility for all. Serving these trips with transit is a challenge but can be made easier by certain types of development, land-use patterns and route design tenets.

Figure 2: Primary Reasons for Using Bus Service

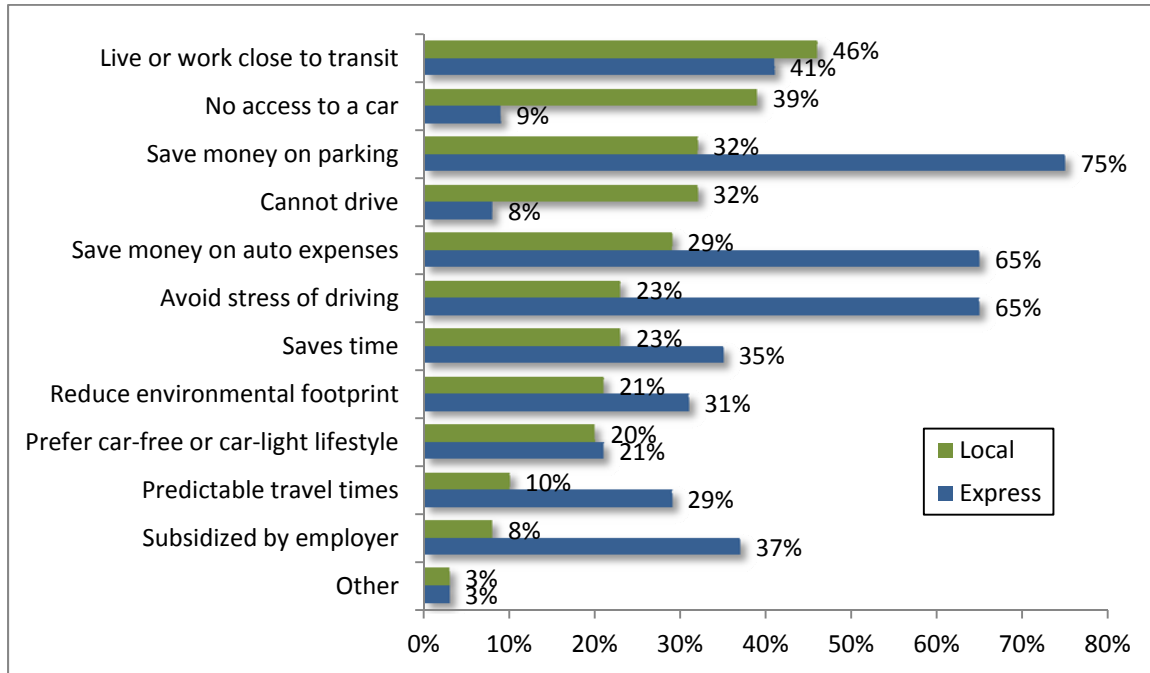
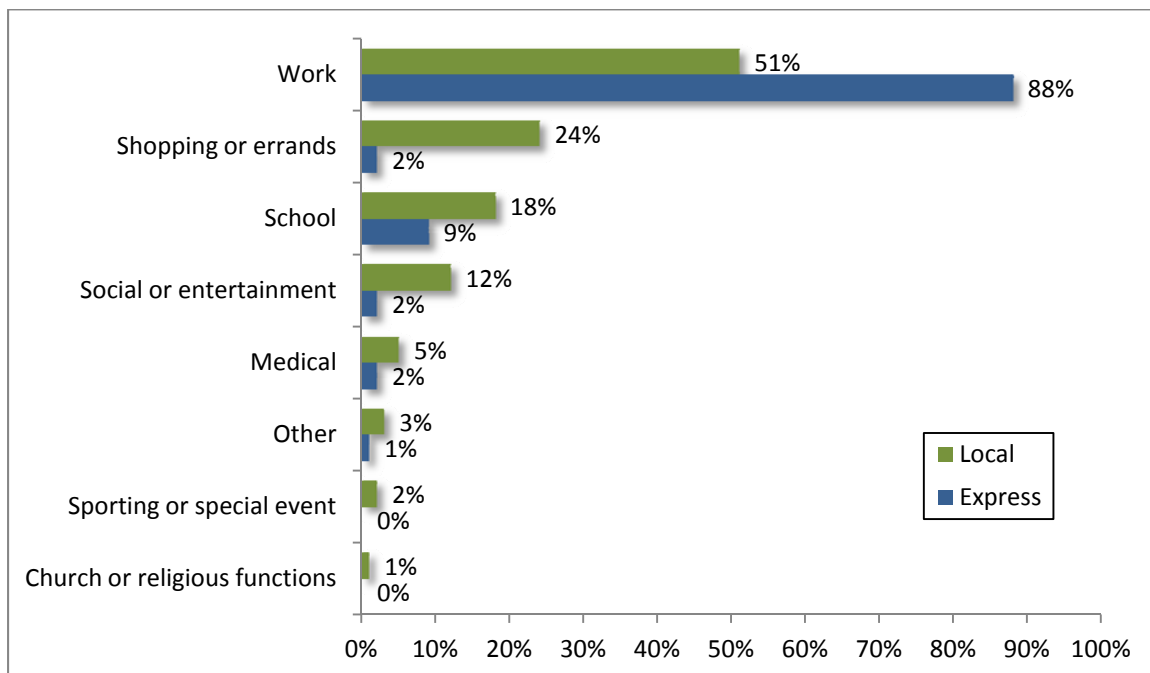


Figure 3: Primary Trip Purpose



## B. Basic Route Planning Principles

Transit planners listen to customer needs and translate them into service on the street. There are some basic route planning guidelines that can help turn the needs and values expressed by transit riders and other stakeholders into effective and efficient transit service. Metro Transit employed these planning best-practices when crafting the SIP.

### 1. Effective Transit

Effective transit accomplishes four goals. It carries people, it is a cost-effective use of public resources, it supports efficient development and it provides a basic level of access region-wide. Higher population levels and employment density make providing transit more cost-effective, allowing for a more efficient use of resources to provide more service. This creates a cycle where transit is supporting efficient land use and land use is supporting more efficient transit.

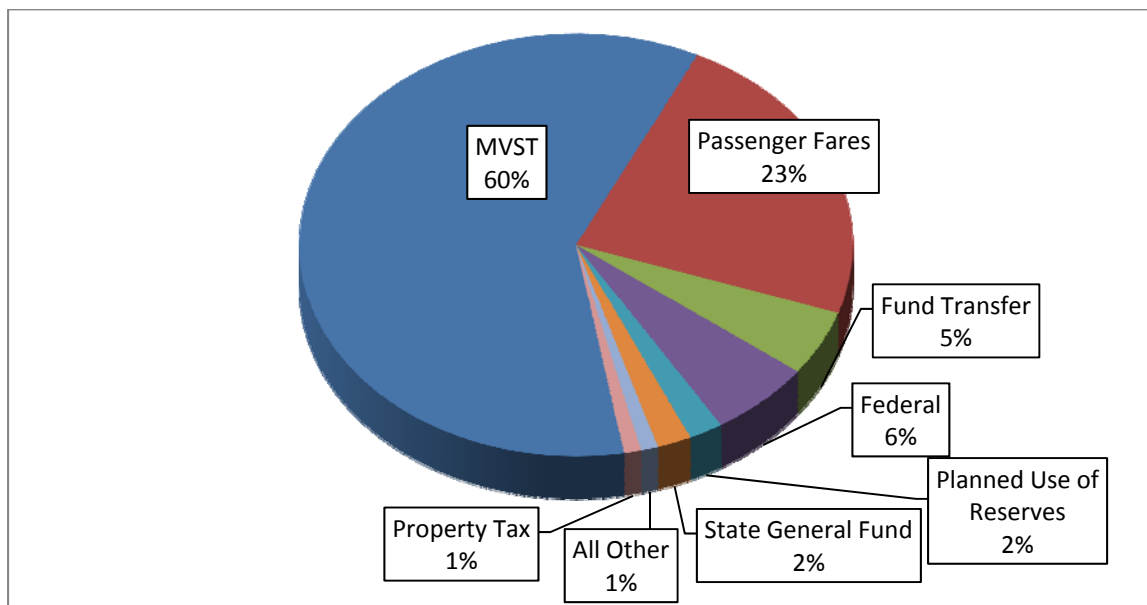
#### *Carries People*

The first component of effective transit is transit that carries people – that is, high ridership levels. This is one of the most important measures in determining the success of a transit route. High-ridership routes are providing valuable services (mobility) to a large number of people. Routes with high ridership also generally require a lower subsidy to operate because fare revenues are higher, allowing Metro Transit to provide more service while using the same amount of public resources.

#### *Cost-Effective Use of Public Resources*

Next, effective transit is a cost effective use of public resources. Figure 4 shows Metro Transit’s 2015 projected Bus Revenue Sources.

Figure 4: 2015 Metro Transit Bus Revenue Sources



Most transit funding comes from sources other than passenger fares, which account for about 27 percent of bus revenue. Metro Transit relies on a number of public funding sources to operate its

service. Those resources are limited, so the agency must be as cost-effective as possible to provide better service to more people. Cost-effectiveness is generally measured by subsidy per passenger. Table 1 shows Metro Transit’s average subsidy per passenger by route type.

**Table 1: Metro Transit Average Subsidy per Passenger**

<b>Route Type</b>	<b>Average Subsidy</b>
Urban Local	\$2.48
Suburban Local	\$3.44
Express	\$2.42

While suburban local and express routes tend to have higher average subsidies than urban local routes, it is important to remember that these types of routes play different but equally important roles in the overall transit network. Generally individual routes are compared against other routes of the same type.

Average subsidy per passenger is determined by the fare revenue that riders on a route generate and the cost of providing the service. A number of factors contribute to the cost of providing service, including the efficiency of route design and the population and employment density of the area the route serves. The biggest cost to providing transit service is labor, so designing routes that maximize the amount of time the operator is in service is important.

### *Supports Efficient Development*

Geographic areas that are conducive to high ridership and cost-effective routes tend to follow certain patterns. The Transportation Policy Plan identifies Transit Market Areas, which help guide decisions about the types and levels of transit service most appropriate for a given area. They are determined by using an index of population density, employment density and automobile availability. There are five market areas reflecting the transit potential of their given geographies. Market Area I is typically the most dense in both population and employment, and has the fewest automobiles per adult. The high number of people and jobs means it can support more intense transit service cost-effectively. Market Area V, with fewer people spread over a relatively large geographic area, is very difficult to serve cost-effectively with transit. Generally the most appropriate type of transit in this area is general public dial-a-ride. A map of the transit market areas is shown in Appendix B.

Land use can support cost-effective and high ridership transit, but transit can have an impact on land use and support efficient development as well. Transit that offers frequent service for long periods of the day, on weekends and to a variety of destinations will allow people to take transit where they need it, when they need it. Customers do not need to consult schedules in advance but rather can just go to the transit stop with the confidence that a bus will arrive soon. This is the type of service that can have a big impact on where people decide to live, work and shop.

Metro Transit’s Hi-Frequency network is one example of transit service that can have an important impact on development patterns. All or portions of Routes 5, 6, 10, 18, 19, 21, 54, 64, 84 and 515 as well as the METRO Blue and Green lines are included in the network. These routes have frequencies of 15

minutes or better on weekdays from 6 a.m. to 7 p.m. and on Saturdays from 9 a.m. to 6 p.m. A map of the Hi-Frequency network is in Appendix C.

### *Provides a Basic Level of Access*

The fourth component of effective transit is service that provides a basic level of access region wide. For any number of reasons, transit is the only means of mobility for many in the region. It is important to provide service that allows people access to employment, shopping, social services, seeing friends and family or any other reason a person may have to travel.

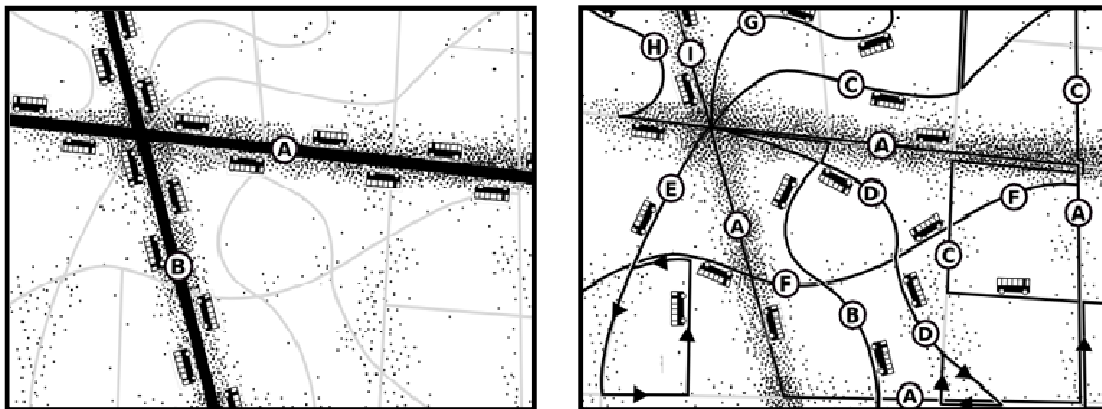
Often this type of service is most needed in suburban communities where the auto-oriented urban form and lower population and employment densities can make it difficult to provide fixed-route transit cost-effectively. In the Twin Cities Transit Link service helps provide mobility in areas where the costs of providing regular-route service is prohibitive.

## **2. Trading off Frequency and Coverage**

There is a tension between providing a basic level of access region wide and the other three components of effective transit, which is the fundamental tradeoff in transit planning. How should service be allocated? Should it be concentrated in denser areas to provide frequent, more attractive service to a high number of people? Should service be more evenly distributed to cover a large geographic area, allowing most places access to some transit, but at a less attractive and frequent level?

Figure 5 illustrates this point. Developed by Houston METRO, the two images have the same number of buses available, but distributed in different ways. The dots represent population and employment density.

**Figure 5: Frequency and Coverage**



The picture on the left shows two bus routes concentrated in dense corridors where many people live and work. This provides very frequent service in these corridors. This scenario will be cost-effective, produce high ridership, and probably support development along these corridors, but the people not living near these routes do not have any access to transit. On the right, every street gets one route with the same frequency, regardless of the number of people or jobs there. This allows everyone to have

some access to transit, but it will be infrequent, require high subsidies and attract fewer riders because it will be less useful overall.

In reality this concept is a spectrum, with most transit systems having a combination of frequency and coverage-based routes. These strategies were used when determining specific projects to be considered in the SIP.

### **3. Route Design**

Transit planners use a number of route design principles to develop a transit network that best reflects the community's needs and priorities for transit. See below for a brief outline of the common route design principles. A more detailed discussion is available in Chapter 6 of the Metropolitan Council 2040 Transportation Policy Plan.

#### ***Routes should serve a variety of trip purposes and destinations***

Routes serving a variety of destinations will have ridership more evenly balanced throughout the day as people can make trips that tend to occur at different times throughout the day like work or school and running errands.

#### ***Routes should have a strong ridership generator at both ends***

Route with strong trip generators anchoring both ends will balance ridership in each direction and prevent overcrowding or under utilization of buses.

#### ***Routes should be simple and direct wherever possible***

Simple, direct routes are easier for customers to understand and allow for more efficient service.

#### ***Routes should avoid duplication of service***

Routes should be spaced far enough apart so that they are not competing with each other for the same riders. This results in even transit coverage and fewer gaps in service.