



SOUTHWEST
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Southwest LRT

Technical Memorandum No. 5

TRANSIT MOBILITY, INTEGRATION & ACCESS EVALUATION

PRELIMINARY
FOR REVIEW ONLY

September 9, 2009



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1.0 INTRODUCTION

This technical memorandum provides an analysis of transit system mobility and integration for the Southwest LRT DEIS. The intent of this evaluation is to assess each LRT alternative with respect to the following performance measures: system integration, transit mobility, transit service, travel time savings, accessibility and the Federal Transit Administration (FTA) Cost-Effectiveness Index (CEI).

2.0 TRANSIT MOBILITY

2.1 System Configuration and Integration

System configuration and integration may be defined as the ability of the Southwest LRT to physically connect (or integrate) with the Twin Cities regional transitway system. LRT system integration refers to the physical organization of multiple LRT lines or routes in a manner that allow light rail vehicles (LRVs) to move seamlessly between LRT lines in response to transportation demands and operational requirements. Establishing an interconnected network of fixed-rail guideways helps to offer reliable and convenient transit service to passengers on high-demand corridors, enabling passengers to connect directly with desired regional destinations, and minimize the need to transfer between LRT lines or other transportation modes.

According to the Metropolitan Council's *Transportation Policy Plan* (TPP), the Twin Cities metropolitan region will add one additional LRT line by 2020 and third line by 2030. The TPP places a special emphasis on establishing a regional system of LRT lines, building on the current Hiawatha LRT line. Among several policies outlined in the TPP for transit, Policy 15 Strategy 15e addresses the development of transitways and states, "The Council will support enhanced transit service along transitways and the integration of existing routes along transitway corridors as appropriate to take full advantage of transitway improvements."¹ Furthermore, the TPP also discusses the importance of coordinated transitway implementation with other modes of transportation, helping to encourage a dynamic, multi-modal regional transportation system. As a result, the region must plan and make provisions for developing an integrated system of LRT lines that focus on passenger convenience and efficient operations.

A system that allows LRVs to transfer easily between all fixed-rail guideways in the entire system is considered to be fully integrated. Partially integrated systems are those that allow some movement between fixed-rail guideways but preclude or restrict other movements. The current Twin Cities LRT system consists of the Hiawatha Line operating between downtown Minneapolis and the Mall of America in Bloomington, Minnesota. An extension of the Hiawatha LRT line from the Warehouse District/Hennepin Avenue Station to the Downtown Ballpark Station and the proposed Minneapolis Intermodal Station near the new Target Field is currently under construction. This extension will connect the Hiawatha LRT line with the Northstar Commuter Rail line. The proposed Central Corridor LRT line, which would operate from the St. Paul Union Depot to the downtown Minneapolis Intermodal Station, is in Preliminary Engineering (PE). The Hiawatha and Central Corridor LRT lines will merge at the intersection of 4th Street South and Kirby Puckett Place/Chicago Avenue adjacent to the Hubert H. Humphrey

¹ The Metropolitan Council, *Transportation Policy Plan*, pg. 102

Metrodome and utilize the same guideway from the Downtown East/Metrodome Station to the downtown Minneapolis Intermodal Station. Hiawatha and Central Corridor LRT trains can travel both east and west along both guideways, but there is no track that allows Central Corridor trains to transfer to the Hiawatha line at the junction of the two routes without traversing past the junction and switching to the opposite track. Therefore, the Hiawatha and Central Corridor are partially integrated.

Transportation and rail system operation planners generally prefer to fully interline or integrate guideway systems whenever possible and where travel demand warrants the additional costs associated with the design and construction of switches and track crossovers, typically required to allow full integration. The primary advantages of fully interlining a system are the following:

- Minimize the need for passengers to transfer between lines, helping to improve ridership and increase travel time savings.
- Allows for efficient movement of LRVs between various lines to balance fleet requirement with demand across the entire system.
- Requires fewer LRVs to operate on the line.
- Responds to changes in travel patterns and demands over time.

2.1.1 Criteria

Integration into the existing and planned LRT system and regional transitway system.

2.1.2 Measurement

Assess the ability of the LRT alternatives to act as part of an integrated system of LRT lines and as part of the regional transitway system. Performance indicators used to evaluate system integration versus non-integration include system connectivity and LRT system operations efficiency, passenger movement and convenience, and minimizing non-revenue service miles.

2.1.3 Evaluation

System Connectivity & Integration

The LRT 1A, LRT 3A and the LRT 3C-2 (11th/12th Street) alternatives are fully integrated with both the Hiawatha and Central Corridor LRT lines. All three alternatives could physically connect to the western terminus of the combined Hiawatha and Central Corridor LRT guideway at the Intermodal Station on 5th Street North, adjacent to the new Minnesota Twins baseball stadium, Target Field. This connection would allow trains from the Southwest LRT to operate on either the Hiawatha or Central Corridor LRT guideway through downtown Minneapolis and on the individual guideways of either LRT line. The LRT 3C-1 (Nicollet Mall) alternative is not integrated with either the Hiawatha or Central Corridor LRT guideway for daily operations. The LRT 3C-1 (Nicollet Mall) alternative guideway intersects with the 5th Street North guideway serving both the Hiawatha and Central LRT lines at approximately 90 degrees. In order to integrate the LRT guideways, the LRT 3C-1 (Nicollet Mall) alternative alignment would require a limited physical crossover connection that allows for minimum movement of LRVs between the

Hiawatha and Central Corridor LRT common guideway and the LRT 3C-1 (Nicollet Mall) guideway. As proposed, a single track turnout would connect the two guideways in order for Southwest LRT, Hiawatha, or Central Corridor LRVs to transition between the two guideways, this configuration would require one turnout, two crossovers, and ten trackway switches. Figure 1 provides an illustration of the geometric trackway configuration that would be required for trains using the LRT 3C-1 (Nicollet Mall) alternative to transfer between the Southwest LRT guideway and the guideway for the Hiawatha or Central Corridor LRT lines.

Figure 1 LRT 3C-1 (Nicollet Mall) Alternative Connection to Hiawatha and Central Corridor LRT

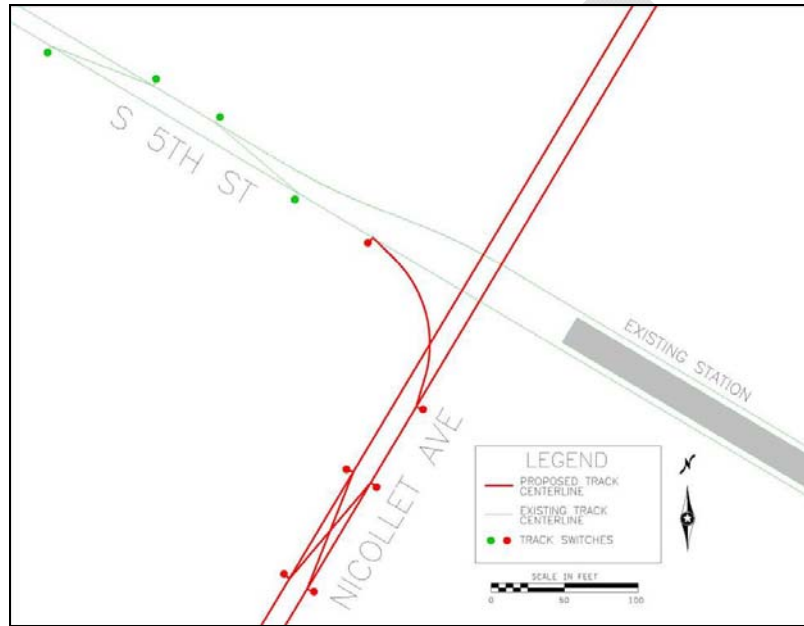


Table 1 provides a synopsis of the identified regional transitways that would be capable of interlining or connecting directly with the Southwest LRT. Clear circles represent fully integrated transitways, semi-colored circles represent partially integrated transitways, and filled circles represent non-integrated transitways. As displayed in the table, LRT 3C-1 (Nicollet Mall) is the only alternative that is not integrated with the regional system.

Table 1 System Interlining Capability

Criteria	Alternative			
	LRT 1A	LRT 3A	LRT 3C-1 (Nicollet Avenue)	LRT 3C-2 (11 th /12 th Street)
Ability of the LRT alternatives to provide connectivity among LRT lines and other high-demand transit corridors	Fully integrated with Hiawatha and Central Corridor LRT lines	Fully integrated with Hiawatha and Central Corridor LRT lines	Not integrated with the Hiawatha or Central Corridor LRT for daily operations	Fully integrated with Hiawatha and Central Corridor LRT lines
Physical connection	Physically connects to combined Hiawatha and Central Corridor LRT at the Intermodal Station	Physically connects to combined Hiawatha and Central Corridor LRT at the Intermodal Station	Physical connection to Hiawatha or Central Corridor would require one turnout, two crossovers, and ten trackway switches.	Physically connects to combined Hiawatha and Central Corridor LRT at the Intermodal Station
Passenger movement/convenience	One-seat ride possible	One-seat ride possible	Stand alone LRT line	One-seat ride possible
Minimizing non-revenue service miles	No additional non-revenue service miles	No additional non-revenue service miles	Requires additional non-revenue service miles to transfer vehicles between lines	No additional non-revenue service miles

LRT Operations

From an LRT operations perspective, alternatives LRT 1A, LRT 3A and the LRT 3C-2 (11th/12th Street) are considered fully integrated into the Twin Cities regional LRT system due to the fixed-guideway configuration at the confluence of the Southwest LRT and the combined Hiawatha and Central Corridor LRT lines. The LRT 1A, LRT 3A, and the LRT 3C-2 (11th/12th Street) alternatives are assumed to operate as extension or through routes providing passengers with a one seat ride to destinations along either LRT line. This configuration allows for unlimited operational flexibility between these lines, providing the opportunity for LRVs to move easily from one line to another, decrease passenger travel times, and minimize non-revenue service.

Transit system planning strives to minimize the number of transfers required by riders to complete a trip by transit. Transfers reduce the attractiveness of transit as an alternative mode of travel and have a tendency to diminish ridership because transfers are inconvenient, introduce uncertainty, and increase the time required to complete the trip. Alternative LRT 3C-1 (Nicollet Mall) would operate as a stand alone LRT line requiring all passengers destined for locations along the Hiawatha and Central Corridor LRT lines to transfer. This alternative has no connectivity to the Hiawatha and Central Corridor guideway on 5th Street. This means the Southwest LRT fleet cannot be shared with the Hiawatha and Central Corridor LRT lines which increases the number of LRVs required to operate the service and increases operating costs due to longer non-revenue service and layover requirements. The LRT 3C-1 alternative has limited operational flexibility and sets up a configuration that substantially restricts system integration.

2.2 Transit Service Evaluation within Corridor

The following section provides an inventory of the existing and future transit services and facilities for which funding has been committed in proximity to the proposed LRT alternative alignments.

Summary of Key Findings

Existing transit service operates throughout much of the Southwest LRT Study Area, although disparities in service exist, with some regions of the Study Area being underserved by transit while other regions are saturated with transit service. The gaps in transit service experienced in regions of the Study Area can result in access and mobility challenges for area residents. Conversely, for those regions saturated with transit service, the introduction of high-frequency LRT service would constitute a redundancy in service that would have several operational cost, ridership, and service implications.

The analysis of existing transit service determined the following key findings:

- The LRT 3A alternative and LRT 3C-2 (11th/12th Street) would constitute a new transit service connecting Minneapolis with the high density employment and residential regions of Minnetonka and Eden Prairie, along with the potential for LRT connectivity to Hiawatha and Central Corridor LRT lines. While the LRT 3C-1 (Nicollet Mall) alternative would provide service to the same job and activity centers in Minnetonka and Eden Prairie as the LRT 3A and LRT 3C-2 alternatives, the Minneapolis end-of-line of the LRT 3C-1 (Nicollet Mall) alternative would not connect with the existing trackway for either the Hiawatha or Central Corridor LRT lines. The LRT 1A alternative would not connect directly with the major job and activity centers of Minnetonka and Eden Prairie.
- LRT 3C-1 (Nicollet Mall) and LRT 3C-2 (11th/12th Street) alternatives would both result in providing duplicate transit service to saturated transit markets already operating efficiently and effectively in the midtown and downtown regions of Minneapolis. Service duplication has several consequences including higher operating costs and sub-optimal resource allocation and utilization.
- LRT 3C-1 (Nicollet Mall) and LRT 3C-2 (11th/12th Street) would not replace the existing bus service operating on Lake Street and Nicollet Avenue. Removing and replacing existing bus service with only LRT service would be detrimental to the existing service levels and disenfranchise current transit riders.
- The LRT 3C-1 (Nicollet Mall) alternative operating on Nicollet Mall would result in the displacement of all local bus service from Nicollet Mall that could impact route ridership levels, disrupt bus operations on alternate streets, and would conflict with the adopted city policy negotiated with downtown businesses for local buses ending downtown to operate as a “Free Fare” shuttle service on Nicollet Mall from Washington Avenue to Grant Street. The LRT on Nicollet Mall would also prohibit bicycle traffic from using Nicollet Mall.
- The LRT 3C-2 (11th/12th Street) alignment in downtown Minneapolis could severely impact the functional capabilities of the Marquette and 2nd Avenue South Transit Project

(MARQ2). The LRT 3C-2 alternative would have similar impacts to those discussed for LRT 3C-1 (Nicollet Mall) on the portion of Nicollet Mall the train would use between 11th and Grant Streets.

- The existing land use patterns and socioeconomic characteristics along the western alignment of the LRT 1A alternative in Minnetonka and Eden Prairie suggest that this region is not a high transit trip generator. The existing bus service operating characteristics, coupled with the Transit Market Index (TMI) analysis results conducted for this memorandum, further suggest that this region is unlikely to generate more transit trips in the near future.
- While transit service is available throughout most of the Southwest LRT Study Area, the circuitous street patterns, transportation or other built-environment infrastructure, and natural land features result in barriers to making bus transit a competitive travel option. In several cases, increasing the volume or frequency of the current bus services would not result in a travel time savings for transit users, nor an incentive to attract future riders. The addition of LRT on dedicated right-of-way could significantly improve transit service and travel times for area residents.
- Programmed future improvements to the current transit network will result in increased service frequencies on select routes, along with frequency reductions and the elimination or consolidation of other routes. Despite these service modifications, bus service is anticipated to operate in similar fashion to the current network, traveling on the same streets and roadways as current service. According to Mn/DOT, virtually all of the arterial roadways and collector streets the bus network currently operates on are projected to experience continued traffic growth and increasing congestion.

2.2.1 Criteria

Inventory the quantity and quality of the existing and programmed transit services within the Study Area and compare this service with and without implementation of LRT service.

2.2.2 Measurement

In order to evaluate existing and programmed future transit service, a quarter-mile analysis area was established surrounding the proposed LRT alignments and station areas. The size of the analysis area was determined based on the average distance persons are typically willing to walk in order to access transit services. The analysis evaluated the existing and programmed future transit service between Eden Prairie and downtown Minneapolis. Using geographic information systems (GIS), the most recent transit service and infrastructure geographic data were obtained from the Metropolitan Council's MetroGIS Datafinder website. This data includes information on bus routes, service frequencies, service providers, weekday and weekend bus trips, directional information, average time travel along route segments, average vehicle travel speeds between stops, and transit infrastructure such as dedicated bus ramps or bus only shoulder lanes.

This analysis considered the type of bus service serving bus stops, park and rides, or transit centers in proximity to the proposed LRT alternatives and station areas; operating characteristics including headway frequencies, hours of service, route variations, key destinations and the number of bus trips made during average weekdays. The analysis also inventoried specific transit facilities including park and ride or transit centers, serving commuter-oriented transit users and where multiple routes connected. Using all available data, route profiles were made of the primary routes serving bus stops in the Study Area and the quarter mile analysis area. This approach was used to evaluate the existing transit operations and levels of service from a network system approach. Using the TPP, programmed future transit services were also considered in relation to the existing services.

Only bus routes providing service to bus stops within the quarter-mile analysis area of the LRT alternatives were considered. Routes passing through the analysis area and not providing service to bus stops within the analysis region were not considered as part of this analysis. The analysis considered bus routes providing service in proximity to the proposed LRT alternative alignments and stations, and not exclusively around proposed station locations. This was done to give a more holistic view of the existing transit services and facilities within the project Study Area.

Furthermore, the analysis did not inventory transit services operating in downtown Minneapolis. Downtown Minneapolis is considered a saturated transit market, with service provided by multiple transit providers. Over 100 bus routes and one light rail line serve hundreds of downtown bus stops, parking garages, transit centers and station platforms. On several downtown streets, over 20 bus routes provide a mixture of local or express services. Most of Metro Transit's "high-frequency" bus routes serve the downtown core, and future service planning indicates a priority focus on increasing transit services in downtown Minneapolis. Additionally, several transit infrastructure projects are currently being implemented or are planned for implementation in the near future. Major transit thoroughfares include Nicollet Mall, Hennepin Avenue, 5th Street, 11th Street, and 12th Street. In an effort to consolidate and enhance downtown transit service, the City of Minneapolis has begun to implement the

Marquette and 2nd Avenue Project (MARQ2) to improve transit reliability and service in downtown. This project is discussed in the following section as a programmed improvement. The comprehensive nature of downtown transit service allows transit users to travel in virtually any direction from downtown Minneapolis to St. Paul or outlying suburban destinations. This analysis is principally interested in those routes serving the project Study Area, and an inventory of all downtown transit routes and bus facilities is beyond the scope of this report. This report will only focus on those routes which provide service in the Study Area and up to downtown Minneapolis.

Along with considering the existing transit network, this analysis also conducted a Transit Market Index (TMI) for the Study Area pursuant to the indices' calculation formula developed by the Metropolitan Council. The TMI analyzes transit market potential for a geographic unit, in this case, Transportation Analysis Zones (TAZ). The tool allows for an understanding of the appropriate services levels to meet current or future needs. Five market areas are established for the Twin Cities metropolitan area, with Area 1 indicating the highest market potential for transit, and therefore prescribing a high volume of transit service. Area 5 is the lowest market potential.

Data obtained from the MetroGIS Datafinder website on the current bus routes and services was current as of January 6, 2009. At the time of this memorandum's publication, SouthWest Transit had consolidated or modified the service of several routes, and was in the process of making additional service modifications not reflected in the Metropolitan Council's current data sets. To the greatest extent possible, changes made to the existing SouthWest Transit services have been incorporated into this analysis.

2.2.3 Existing Service Inventory

Service Providers

Existing transit services within the Study Area are provided by two transit agencies, Metro Transit and SouthWest Transit, along with selected routes provided by private transit providers under contract with the Metropolitan Council. Metro Transit, the Twin Cities primary transit service provider, is responsible for the operation of fixed-route transit services for the Metropolitan Council, including limited-stop, express, and local bus routes along with ADA-compliant paratransit service. Within the Study Area, Metro Transit provides service to the cities of Minneapolis, St. Louis Park, Hopkins, Edina, and Minnetonka. Services provided to these cities are a mixture of express, local, and circulating loop routes, along with Dial-a-Ride service as applicable. Metro Transit is also responsible for the operation of the region's light rail system, and would be responsible for the Southwest LRT's operation following construction. The vehicle fleet is comprised of standard 40 foot long buses and articulating buses, with a mix of hybrid electric and gasoline vehicles, and 27 light rail vehicles.

SouthWest Transit is a service of three communities, Eden Prairie, Chaska, and Chanhassen, operating under a Joint Powers Agreement and governed by a seven-member Commission with representation coming from all three cities. Most of SouthWest Transit's routes provide express, intercity line-haul bus service between these communities and downtown Minneapolis, the University of Minnesota, and the Southdale shopping center. Some local bus service is also provided in the form of circulating loop and feeder bus service to major regional destinations, employment centers, and commuter facilities such as the Eden Prairie Town Center, Southdale

Shopping Center, Hennepin Technical College, and the Eden Prairie Library. SouthWest Transit's vehicle fleet is mostly a coach bus fleet but includes some shuttles and standard 40 foot buses, all of which are ADA accessible.²

In addition to these two service providers, the Metropolitan Council also works with nine other suburban transit providers to coordinate transit services between agencies, establishing linked connections to most areas of the metropolitan region. While some of these services share bus stops with Metro Transit and SouthWest Transit in downtown Minneapolis, none of these additional providers offer service to destinations in the Study Area, and are therefore not included in this inventory.

Transit Market Index (TMI)

Understanding transit service demand is critical to understanding the existing service characteristics of the bus network operating in the Study Area and in proximity to the proposed LRT alternative alignments. In effort to maximize transit service productivity, the Metropolitan Council employs the TMI formula to identify and guide transit service investments. The TMI formula measures the transit market potential for a geographic area, and based on the output, prescribes a type and level of transit service for the market area. It should be noted that the TMI is not intended to prescribe transit service levels for specific routes; the level of transit service is determined by demand. While the primary indicators of transit productivity are development density and origin/destination pairings, the TMI helps to identify the appropriate service type for geographic regions in order to target transit investments to maximize network efficiency. The formula is calculated using three factors including population density, employment density, transit dependency, and considered in the context of populated land use acreages. For a given geographic area a numeric value is assigned based on the TMI calculation. In the case of this analysis, Transportation Analysis Zone (TAZ) data were used in effort to project future transit market areas for year 2030. Because transit dependency is not projected out to year 2030, it was assumed to be consistent with the levels of transit dependency in 2000.

Using the Metropolitan Council's TMI formula, a market index was created for the Study Area (Figure 6) to review the transit market potential. The geographic unit used for this analysis were TAZs determined by the Metropolitan Council. Because the Census aggregates population age by two year age cohorts, with one group for 15 and 17 year-olds, the TMI formula was modified to include this age cohort because there is no way to separate 16 year-olds and up specifically from the data.

Figure 2 graphically displays the TMI calculated for the TAZ districts within the Study Area. As may be expected, the output indicates that current transit service demand is highest around midtown and downtown Minneapolis, tapering as distance from midtown and downtown Minneapolis increases. Unsurprisingly, current transit services are most abundant and are particularly strong in the midtown and downtown regions. Figure 2 displays the TMI for 2000 and Figure 3 displays the TMI projected out to 2030 based on the TAZ projections for population, households, and employment. Figure 4 shows the total number of weekday bus trips made on roadway segments in the Study Area. The data indicate the high concentration of weekday transit trips in downtown and midtown Minneapolis, and as distance from downtown

² SouthWest Transit vehicle fleet information obtained from SouthWest Transit website (http://www.swtransit.org/About_Us.html)

Minneapolis increases, transit service characteristics change to a express, commuter-focused networks. The two maps display the strong correlation between the transit market and existing service characteristics. The midtown and downtown regions of Minneapolis are considered to be saturated transit markets, while other regions of the Study Area exhibit the growth characteristics that will warrant additional investment in transit infrastructure in future years.

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Figure 5

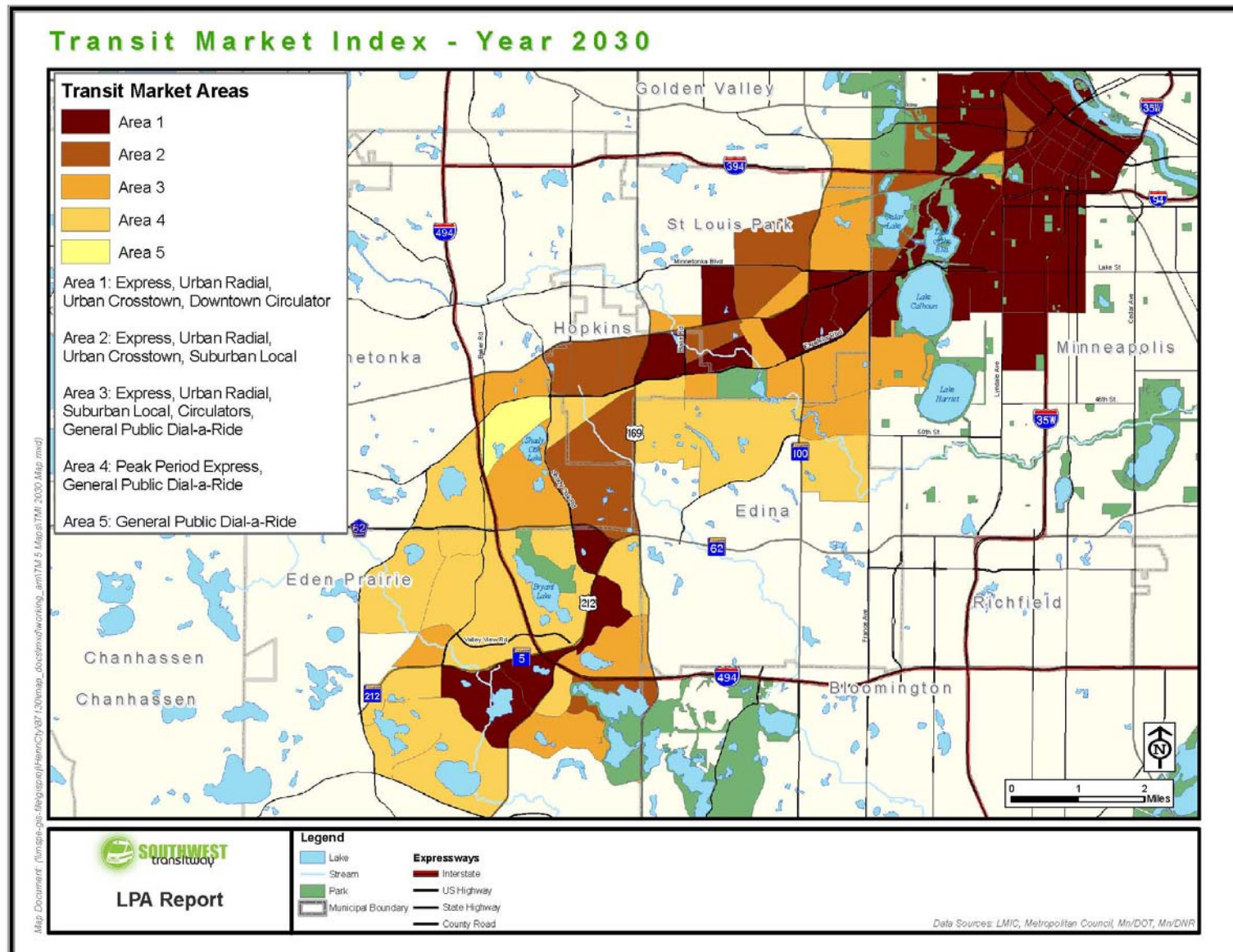


Figure 6

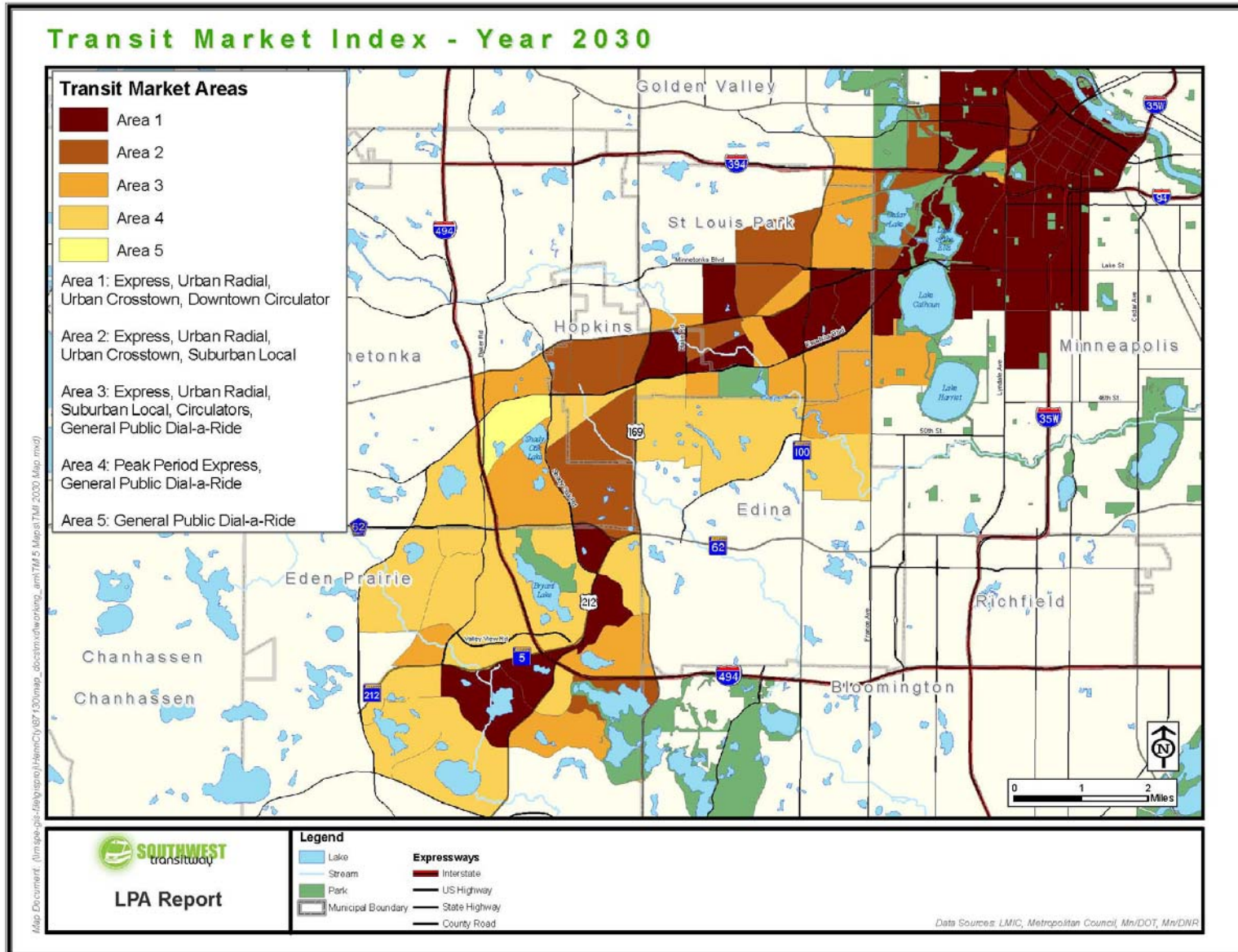
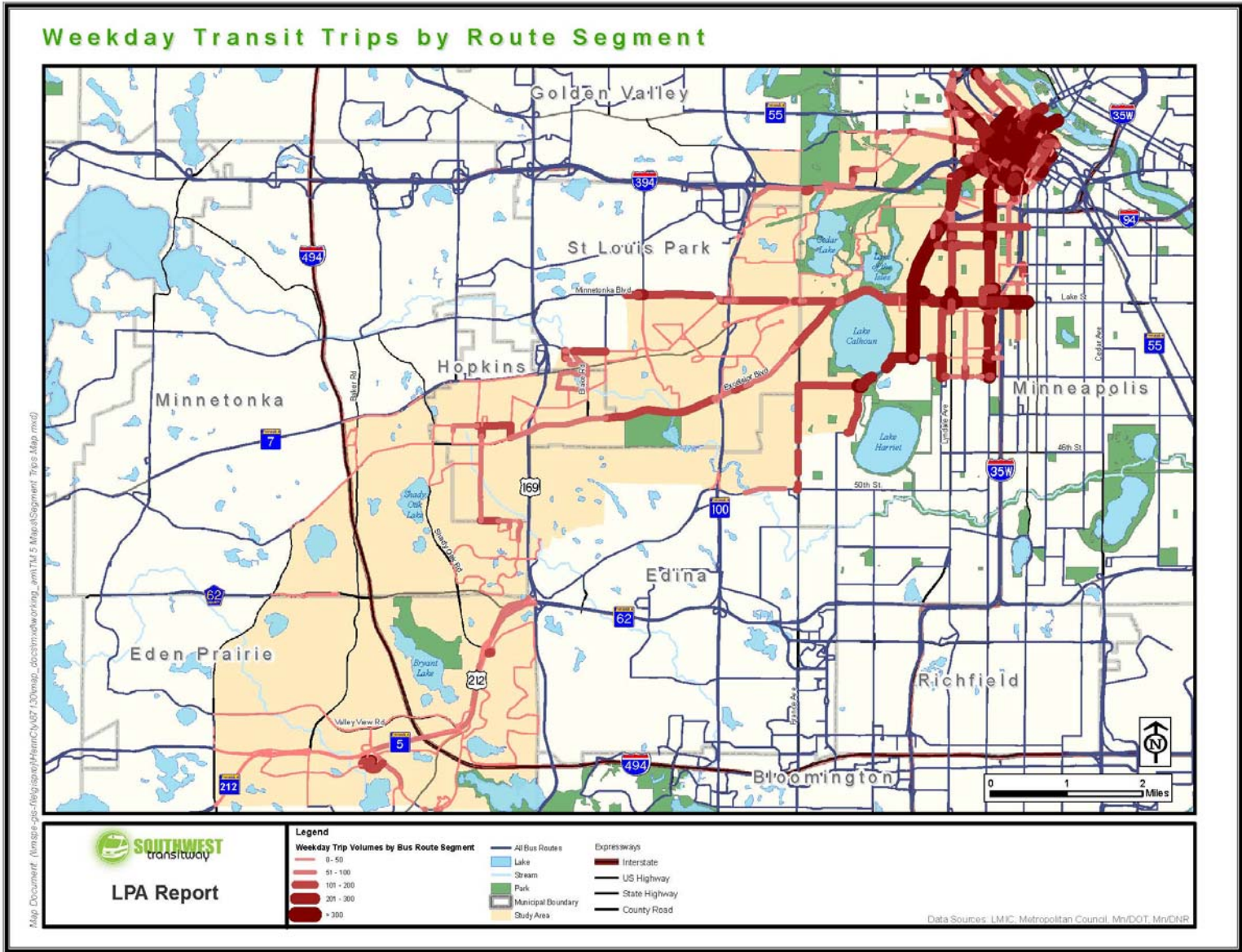


Figure 7



Transit Service Summary

Existing transit service within the Southwest LRT Study Area is a wide variety of service types, ranging from express services to local bus service. Transit service productivity within the project Study Area is generally high, with most routes operating at optimal capacities with steady ridership volumes. While service modifications have been made by both Metro Transit and SouthWest Transit to cut or suspend underperforming services, the current services within the Study Area replicate the transit market demand levels as displayed by the TMI in Figure 2. Within the Study Area, a total of 92 bus routes provide service to more than 1,200 bus stops. Refining the analysis area to a quarter-mile radius surrounding each LRT alternative, 25 bus routes provide service to more than 475 bus stops, park and rides, and transit centers.

The principal type of weekday service is intercity express service, with some intercity local and circulating loop services. The type of service currently provided is reflective of the trip-making behaviors of transit users in the Study Area. Most transit users in the Study Area are commuters making either home-based work or home-based school trips. On weekends, transit service is available on a limited basis within the Study Area, and intended to serve home-based work as well as home-based shopping trips. Most of the express routes operate during the weekday morning and afternoon peak periods, although some off-peak early morning, mid-day, and evening express service is provided at reduced frequencies. While service headways vary, the majority of the current routes operate at approximately 30 minute headways (or less) during the peak periods. Off-peak service is provided by the local and circulating loop routes, running at increased headways, generally between 30 and 45 minutes apart. Directionally, most of the routes provide inbound service to downtown Minneapolis during the morning peak period, with outbound service provided in the afternoon peak period. SouthWest Transit provides one reverse commute route during the weekday peak periods only.

The following route profiles describe the service characteristics of selected routes providing regular bus service to the Study Area. These routes were determined to be the routes which most closely replicated the proposed LRT alternatives. In addition to the 10 bus routes profiled, 15 additional bus routes provide service to stops, park and rides, and transit centers in proximity of the proposed LRT alignment alternatives. An inventory of the service characteristics for the primary routes serving the Study Area and within a quarter mile distance of the proposed alternative alignments is also provided. Figure 3 provides a graphic of the routes profiled below.

Primary Bus Routes in the Southwest LRT Study Area

Metro Transit Route 12 – This route provides bi-directional weekday and weekend local bus service from downtown Minneapolis to downtown Hopkins and the Opus II office complex in Minnetonka. The route makes 95 weekday end-to-end trips with service beginning at 5:08 AM and ending at 1:37 AM the following morning. Both the initial and final trips are eastbound runs, starting at Opportunity Partners in Minnetonka and ending at the intersection of Hennepin and Washington Avenues in Minneapolis. Westbound runs begin at 5:15 AM and conclude at 12:57 AM, operating from downtown Minneapolis to United Health in Minnetonka. Peak period headways typically range from 10 to 20 minutes, with off-peak headways of approximately 30 minutes. The route serves several activity centers and major employment centers including Excelsior and Grand, Opus II, Methodist Hospital, the Uptown region of Minneapolis, and downtown Minneapolis.

The route includes several service variations for westbound buses that provide service to specific businesses or activity destinations throughout the day. These include the Route 12, 12B, 12C, 12D, 12F, 12G, 12K, and 12X. These service variations result in certain portions of the route having a higher number of trips than other portions. More specifically, near the proposed Shady Oak Station, the Route 12K bus makes three morning and three afternoon trips on K-Tel Drive in Hopkins. However, along portions of Excelsior Boulevard, all variations of the Route 12 contribute to a total of 49 eastbound trips and 46 westbound weekday trips.

As specified in the fiscally constrained TPP, future transit network planning identifies the Route 12 as one of several arterial bus routes. Arterial bus routes are defined in the TPP as high-demand local routes operating at 15 minute or less headways during the peak periods, with up-to-24-hour service, improved passenger facilities, and exhibit the characteristics of routes that could be upgraded to operate as a regional transitway in the future.

Metro Transit Route 17 – The Route 17 is a local weekday and weekend route with service between northeast Minneapolis and Hopkins via Minnetonka Boulevard and TH 7. The Route 17 bus operates at high frequencies throughout the day, from 5-15 minutes during the peak periods and 10-15 minutes in the off peak periods, providing service between 27th Street in north central Minneapolis and Knollwood Mall and Ramsgate Apartments in Hopkins. This equates to approximately 10 buses in the peak periods serving bus stops along this route. The route also shares several stops with the limited stop Route 615. Key destinations along the route include Knollwood Mall, St. Louis Park City Hall, Hennepin Avenue, the Uptown Transit Center, and Ramsgate Apartments. The route provides bi-directional daily service, making a total of 156 end-to-end weekday trips, 120 Saturday trips, and 72 Sunday trips. Route 17 has several service variations including the 17A, 17B, 17C, 17D, 17F, 17W, and the 17X. Of these routes, the 17W and the 17X only operate in the eastbound direction.

Weekday service begins at 4:36 AM and concludes at 2:05 AM. The route operates at 5-15 minute headways during the peak periods, with 10-15 minute headways during the mid-day off-peak period, and 30 minute evening headways. On Saturdays, the route runs at 15-30 minute headways and 30 minute headways on Sundays. During the work week, the first eastbound run begins at 5:01 AM and the final eastbound run is completed at 2:05 AM. The initial westbound run starts at 4:36 AM with a final westbound run completed at 1:50 AM. The route serves 92 bus stops in proximity of the proposed LRT alternative alignments in Hopkins, St. Louis Park, and Minneapolis. Similar to the Route 12 bus, the TPP also identifies the Route 17 as an arterial bus route in 2030.

Metro Transit Route 18 – Metro Transit's Route 18 bus is a designated high frequency bus route serving Nicollet Avenue and Nicollet Mall with service between downtown Minneapolis and Bloomington. High frequency service is provided between Richfield and downtown Minneapolis. The route operates almost 24 hours per day, with service provided on weekdays and weekends. During the peak periods, the route operates at 5-8 minute service frequency headways, 7-8 minute headways during the midday period, and 7-15 minute headway during the evening hours. On Saturdays, the route operates at 7-10 minute headways and 10-15 minute headways on Sundays.

As one of twelve designated high frequency routes, the Route 18 provides a basis for future arterial bus routes programmed in the 2030 TPP. According to the TPP, the regional network of arterial bus routes is anticipated to grow, and modifications to the existing high frequency

network are anticipated. Several of the current high frequency network routes are being considered for upgrades to regional transitways as bus rapid transit (BRT) facilities. The TPP has identified Nicollet Avenue as a potential BRT transitway by 2030. The limited-stop BRT service would likely be supplemented by local service continuing to operate on Nicollet Avenue.

Metro Transit Route 25 – The Route 25 provides weekday and Saturday local service connecting midtown Minneapolis with the Northtown Transit Center in Blaine traveling through the West Calhoun, Cedar-Isles-Dean, Kenwood, and Lowry Hill neighborhoods. During weekdays, the route makes 66 end-to-end total daily trips, with service beginning at 5:07 AM, and ending at 7:26 PM. Service characteristics differ along portions of the Route 25 alignment. In the West Calhoun, Cedar-Isles-Dean, Kenwood and Lowry Hill neighborhoods, the Route 25 principally operates during the weekday peak periods, with a few early morning and evening off-peak service runs, and does not provide mid-day service. Service during these periods is generally at 30-35 minute headways. On weekends, the Route 25 bus does not provide service to these neighborhoods. Between downtown Minneapolis and the Northtown Transit Center, the route operates at 7-10 minute headways during the peak periods and 60 minute headways in the off-peak periods. On Saturdays, the route makes 14 trips at roughly 80 minute headways between the Northtown Transit Center and the Leamington Ramp. No Sunday or holiday service is offered.

Metro Transit Routes 664, 665, 668 – Routes 664, 665, 668 are all express commuter routes with service between downtown Minneapolis, St. Louis Park, Hopkins, and Minnetonka. Each route operates during the morning and afternoon peak periods only, with eastbound service in the morning and westbound service in the afternoon. Each route makes three to ten round trips, operating at approximately 10 to 30 minute headways.

Route 664 provides service along Excelsior Boulevard through St. Louis Park, Hopkins, and Minnetonka, terminating at the Minnetonka/Eden Prairie city border on County Road 62. The route provides 4 eastbound only trips during the morning peak period, and 5 westbound only trips in the afternoon peak. Morning service begins at 5:48 AM and runs until 8:14 AM, between which time 4 bus trips are made along the route. The first three trips during the morning peak cover the entire route, operating at approximately 20 minute headways, while the final morning trip runs between 7:32 AM and 8:14 AM and serves a reduced number of stops. Conversely, 5 trips are offered during the afternoon peak period, with service operating from 3:36 PM to 6:34 PM. Afternoon service headways are approximately 30 minutes.

Route 665 provides limited-stop service along the I-394 and TH 169 corridors, with stops only in downtown Minneapolis, Hopkins and Minnetonka. During both peak periods, the route operates at approximately 30 minute headways, with morning service running from 6:13 to 7:53 AM and afternoon service between 4:08 and 5:47 PM. Like the Route 664 bus, morning service is eastbound exclusively, with westbound afternoon service. The route makes 3 morning eastbound trips and 3 afternoon westbound trips.

Route 668 operates in Minneapolis, St. Louis Park and terminates in Hopkins at the Ramsgate complex. The Ramsgate region of Hopkins is a significant generator of transit trips to and from the region, resulting in the Route 668 having high levels of transit service productivity within the entire Metro Transit system. Similar to routes 664 and 665, morning peak period service is only offered in the eastbound direction, beginning at 6:40 AM and continuing until 8:54 AM. Afternoon peak period service is exclusively westbound, with service operating between 4:38

and 6:48 PM. The route does have one service variation, with two morning and afternoon buses providing service to Liberty Lane and 33rd Street in St. Louis Park. Route 668 operates at approximately 20-30 minute headways during the peak periods, with 5 morning eastbound trips and 4 afternoon westbound trips.

SouthWest Transit Route 603 – The Eden Prairie Circulator operates as a circulating loop route with service to major employment, shopping, and regional destinations in Eden Prairie. The route originates and terminates at the Southwest Station, and operates in a clockwise direction during the morning switching to a counter-clockwise direction in the afternoon. The route makes eight morning trips, with four trips running during the peak period at 30 minute headways, and four additional trips during the off-peak period at 1 hour headways. During the afternoon counter-clockwise service, the route makes 10 total trips, operating at 40 minute headways during the off-peak midday period and at 40 minute to 1 hour headways during the afternoon peak period. During the afternoon peak period, the route makes a total of 4 trips. Service begins at 5:55 AM, and concludes at 7:13 PM.

The route only provides weekday service. Saturday only service is provided by the Route 693. This route provides service to the same destinations served by the Route 603 during the weekdays while adding service to the Southdale Mall in Edina. Route 693 operates at 1 hour headways from 7:00 AM to 6:00 PM.

SouthWest Transit Route 684 – As the only reverse commute route between downtown Minneapolis and Eden Prairie, this route provides peak period westbound service in the morning and peak period eastbound service in the afternoon and early evening, operating at approximately 45 minute headways between trips. The route is intended to serve employees working in the southwestern metropolitan region living in or close to downtown Minneapolis. The route travels on I-394, TH 169, TH 212 and TH 5, with stops at the Shady Oak Park and Ride and the Southwest Station in Eden Prairie. Westbound morning service begins at 5:00 AM, and concludes at 10:45 AM. Eastbound afternoon service begins from Chaska, Minnesota, at 1:25 PM and concludes at 6:30 PM. The route provides three eastbound morning trips during the off-peak midday period from 9:45 to 1:15 PM, but the majority of morning service is westbound. The route serves downtown Minneapolis, the Golden Triangle region, Southdale Mall, the Southwest Station and the Shady Oak park and ride.

The route operates along I-35W, TH 62, and TH 212 between Gateway in downtown Minneapolis and the East Creek Station in Chaska, with stops at the Southwest Station, the Golden Triangle region, and Southdale shopping center. While the route is marketed as a reverse commute route, some off-peak eastbound service is provided in the morning and early afternoons between 9:30 AM and 3:30 PM. Route 684 represents the consolidation Routes 631, 681, and 683.

SouthWest Transit Route 690 – Routes 690 and 690U are both limited-stop, intercity line-haul routes providing service from the Southwest Station in Eden Prairie to downtown Minneapolis and the University of Minnesota. The routes follow a similar alignment, the difference between the two routes being the terminus points in Minneapolis; the 690 terminates in downtown Minneapolis, while the 690U makes stops in downtown Minneapolis and terminates at the university. Both routes provide all day eastbound service, with service beginning at 6:20 AM and concluding at 7:56, while westbound service is only provided in the afternoon, beginning at 3:38 PM and concluding at 6:57 PM. During the morning peak period, both routes operate at 5-10

minute service headways, and according to SouthWest Transit staff, each of the buses during the peak periods operate at full capacity. The routes are primarily intended to serve commuting university employees and students.

During the afternoon peak period, the 690U provides only two mid-afternoon peak period trips from the university. Instead, service from the university is provided by a collection of different routes, including the 680, 685, 685A, 694, and 695.

SouthWest Transit Route 698 – This route operates primarily during the midday off-peak period, with service between the East Creek Transit Station in Chaska, Minnesota, and the University of Minnesota. The route has one service variation, the 698A, and provides service at 45 to 60 minute headways, with 14 bi-directional trips made during weekdays only. Of these trips, 9 are westbound and 5 are eastbound, with buses operating between 8:50 AM and 5:42 PM.

Transit Infrastructure

In addition to the route profiles above, the following section describes selected transit facilities within the Southwest LRT Study Area contributing to transit use and served by some of the routes profiled above.

Southwest Station - The Southwest Station, a large transit center owned and maintained by SouthWest Transit, serves as a critical link for transit operations in the southwest metropolitan region. A total of 10 bus routes make more than 100 weekday trips to the facility. Of these trips, 46 trips are eastbound, principally during the morning hours, and 50 trips are westbound, mostly during evening hours. Additionally, local bus service contributes several weekday trips. Of all the routes traveling through the facility, routes 603, 690, 690U, and 693 terminate at the Southwest Station, with all other SouthWest Transit routes terminating at other transit centers further to the southwest. Routes 690 and 690U provide a total of 43 weekday limited-stop trips between the Southwest Station, downtown Minneapolis, and the University of Minnesota via TH 169, I-394 and Hennepin Avenue and 4th Street in downtown Minneapolis. As described above, routes 603 and 693 are circulating loop routes with service in Eden Prairie and to the Southdale Mall on Saturdays. The facility includes exclusive TH 5 bus-only on- and off-ramps, and provides a parking ramp structure with 935 parking stalls, along with surface parking stalls.

Uptown Transit Center – The Uptown Transit Center is located on Hennepin Avenue above the Midtown Corridor. The facility is served by Metro Transit routes 6, 12, 17, 21, 23, 53, 114, and 115, and has several gates, with some gates receiving over 250 weekday trips. Passenger amenities include heated waiting areas, wide sidewalk queuing areas, bicycle lockers and storage racks, and wayfinding kiosks. Parking is unavailable at the facility however, paid and unpaid neighborhood parking is available around the facility. The facility has also served as testing ground for “real-time” bus arrival schedule signs that tell travelers the remaining waiting time for the next bus.

Shady Oak Park and Ride – This facility, built in 1988, is located at the junction of TH 212 and Shady Oak Road in Eden Prairie. The facility is a surface parking lot and includes 72 parking stalls. SouthWest Transit provides 7 routes to this stop, making a total of 69 weekday trips and 24 weekend trips to this facility.

Hopkins Transit Center – Located on Excelsior Boulevard, the Hopkins Transit Center is a small park and ride facility served exclusively by the Route 665 bus. Approximately 50 parking stalls are available, and the facility provides a bus shelter for passengers.

2.2.4 Programmed Transit Service Improvements

The Metropolitan Council's 2030 TPP provides policy guidance on proposed future changes and investments to the transit network and transit infrastructure within the seven-county metropolitan region. According to the TPP, the 2030 bus transit network is anticipated to operate similarly to the existing network.³ The TPP states that the bus network must remain flexible and be capable of responding to system changes and the needs of metropolitan communities as the population changes and migrates, as regional destinations grow or contract, and as the costs of travel and congestion increase with time. Future transit services must be able to expand or contract depending on transit service demand.

A primary goal outlined in the TPP is to double current transit ridership levels by 2030. To achieve this goal, the TPP proposes two approaches: 1) maintain and grow the current bus system and ridership, and 2) develop a network of high-frequency bus and rail transitways.⁴ As part of this goal, the Metropolitan Council specifies that future transit services will be market demand driven, and using the TMI formula, the Council will be able to identify the appropriate levels of transit service for particular markets.

According to the TPP, local bus route coverage is anticipated to expand, with the addition of new routes by 2030. As noted, the TPP does suggest that route modifications may be made, however, with the region anticipated to grow by more than 1 million new residents it is likely that the existing bus network will grow. This is also consistent with the adopted city plans within the metropolitan region that discuss growing populations and the importance of providing transit services. The TPP also supports the creation of arterial bus routes, operating at high frequencies during the peak periods and operating seven days per week. Routes 12 and 17 are targeted to become arterial bus routes. Express and long-distance express bus routes are also expected to grow, especially for communities outside of the Twin Cities seven county metropolitan region. The TPP anticipates the construction and operation of a regional transitway network by 2030 that includes the Southwest LRT.

In effort to achieve the goal of doubling ridership levels by 2030, the TPP also identifies the need for expanded passenger facilities and transit-supportive infrastructure as a catalyst for attracting new riders. Noting that transit passenger facilities “provide convenient and attractive service,” the TPP identifies several existing transit facilities for expansion and proposes the construction of new facilities. These new or expanded facilities include park and rides, transit centers, bus shoulders and exclusive bus access ramps to major arterial roadways and highways. In the Study Area these facilities include the Southwest Station transit center and the Shady Oak park and ride. Improved passenger amenities are also mechanisms that help to attract future riders. These can include sheltered bus stops, heated waiting areas, ADA-accessible bus stops, technology improvements and wayfinding systems.

³ Service modifications to the existing network are anticipated to occur. Ridership fluctuations, budget constraints, and changes in land development patterns (e.g. regional destinations) all have the potential to affect transit performance.

⁴ The Metropolitan Council *Transportation Policy Plan*. Pg. 105

In addition to the TPP, each of the cities the Southwest LRT would travel through have drafted or adopted new comprehensive plans that specify future transportation and transit improvements. The details of these plans and the impact of the Southwest LRT project are discussed in Technical Memorandum 4. Each of the plans generally support transit, and supports maintaining the existing transit network while considering future modifications or possibly adding additional services as warranted.

Capital projects already under construction that will affect transit operations include the following:

- **Marquette and 2nd Avenue Project (MARQ2):** The MARQ2 Project represents an investment of \$33 million dollars for transit system improvements in downtown Minneapolis intended to improve operating efficiencies of the current transit services in downtown, transit visibility and reliability. Currently under construction, the project will result in 2 contra-flow bus lanes on both Marquette and 2nd Avenues, along with improved pedestrian walkways, wayfinding features, passenger waiting and queuing areas, more attractive streetscapes and public art. Once operational, the new bus lanes are anticipated to be capable of handling more than 180 buses per hour during the peak periods, consolidating many downtown routes to these streets, and helping to improve automobile, pedestrian, and bicycle flows.
- **Extension of the Hiawatha LRT Line:** As part of the new Target Field baseball stadium, the Hiawatha LRT line is being extended from its current downtown terminus between Hennepin Avenue and 1st Avenue North, along with the construction of tail tracks down to the entrance of the Hennepin Energy Resource Center. Along with this extension, a new Downtown Ballpark Station is also under construction and will be open for use in early to late fall of 2009.
- **Northstar Commuter Rail:** The Northstar Commuter Rail is nearing construction completion, with revenue service set to begin fall of 2009. This service will be the Twin Cities first commuter rail corridor, connecting Big Lake, Minnesota with Minneapolis. The southern terminus point of this railway is the new Target Field baseball stadium, also currently under construction, and proposed Intermodal Facility Station.
- **Bus-Only Shoulders:** Around the Twin Cities metropolitan region, transit advantages have been created to help improve transit travel times between destinations. These include 250 miles of bus-only shoulders, 10 miles of bus-only lanes, ramp meter bypass lanes, high-occupancy vehicle (HOV) and high-occupancy toll (HOT) lanes and a small network of exclusive transitways. As part of the TPP, the Metropolitan Council has adopted policies which support the expansion of new and existing facilities and the continued use of existing facilities to maximize the effectiveness of transit when competing with the travel time of the private automobile and for service reliability. The TPP contains a map detailing the specific locations of existing and proposed new bus-only shoulders, but does not set a time-table for when these new facilities may open.
- **Vehicle Fleet Overhaul:** The Metropolitan Council has adopted a fleet policy to guide the acquisition, use, maintenance, and disposal of transit vehicle fleets for the region. Metro Transit recently began to replace some buses with new, hybrid electric buses.

Programmed future improvements to the current transit network will result in new services, increased service frequencies on select routes, and frequency reductions or the elimination or consolidation of other routes. However, despite these service modifications, the bus network currently operating in the Southwest LRT Study Area is anticipated to operate in similar fashion to the current network, traveling on the same streets and roadways. According to Mn/DOT, virtually all of the arterial roadways and collector streets the bus network currently operates on are projected to experience continued traffic growth and increasing congestion. While increasing the frequency of select routes may increase the overall capacity of the system, increased roadway congestion will not improve overall travel times or system performance. In turn, this could lead to additional gaps in service.

2.2.5 Analysis by LRT Alternative

LRT 1A - Considered from west to east, transit service levels and the amount of supportive infrastructure increases as the Southwest LRT route nears Minneapolis. However, gaps in service exist, and several areas around the alignment are without transit service. Of the four LRT alternatives, the LRT 1A alternative has the least amount of existing transit service and supportive infrastructure within a one-quarter mile radius of the proposed route alignment and station areas.

Within the quarter-mile radius surrounding the LRT 1A alternative alignment, 11 bus routes provide service to over 180 bus stops. The principal routes providing service in proximity to the alignment are Metro Transit routes 12, 17, 25, 664, 665, and 668. Most of the bus stops are open-air curbside stops, without sheltered waiting areas, public benches, or other traveler amenities. Of all the bus stops in proximity to the LRT 1A alignment, 10 are equipped with weather-shielding bus shelters and waiting areas. From west to east, transit service increases in volume and service frequency with regard to the number of trips made to each bus stop in the analysis region. Bus stops located closer to the Minneapolis border with St. Louis Park have the highest volumes of weekday and weekend trips. Transit facilities in downtown Minneapolis at the alternative's northern terminus are equipped with more rider amenities, the result of higher usage and more frequent service.

The western portion of the LRT 1A alternative between the Shady Oak Station and the Highway 5 Station is the area along the alternative with the least amount of transit service and supportive infrastructure. Only 11 bus stops are located within a quarter-mile of the alternative, served by only 3 bus routes. Metro Transit's Route 12(K) bus, a variation of the Route 12 bus profiled above, serves 8 of these stops on K-Tel Drive and 5th Street in Hopkins, clustered around the Shady Oak Station. A ninth stop is located near the proposed Shady Oak Station on the western side of downtown Hopkins. Metro Transit's Route 665, an express bus route, shares some of these stops during the morning and afternoon peak periods. The Route 12(K) makes 3 early morning weekday westbound trips. Along with this route, Metro Transit's Route 12 (C & G) buses also provide service near the proposed Shady Oak station. The LRT 1A alternative proposes the construction of three station platforms, Highway 5, Highway 62, and Rowland, between the border of Hopkins and Minnetonka to Eden Prairie along right-of-way currently owned by the HCRRA. Transit services currently operating in proximity to these station locations are very limited. No transit services currently provide service within one-quarter mile of either the Highway 5 or Rowland stations.

Near the proposed Highway 62 station, the end-of-line bus stop for Metro Transit's Route 664 bus is located immediately outside the one-quarter mile analysis region. The Route 664 bus

completes its service run by looping around West 62nd Street and County Road 62 on the Minnetonka/Eden Prairie border, above the location of the proposed station platform.

The remaining two bus stops are located at the intersection of Valley View Road and Howard Lane in Eden Prairie between the proposed Highway 62 and Highway 5 stations. These stops, also adjacent to one another, are both curbside stops and are not equipped with weather protective shelters or public benches. SouthWest Transit Route 685 provides weekday limited stop service from Eden Prairie via Valley View Road to downtown Minneapolis and the University of Minnesota. This service operates 4 eastbound morning buses and 6 westbound evening buses during the peak periods only. Future transit planning indicates that the western portion of the LRT 1A alternative is anticipated to continue to operate at current or reduced levels. Transit services and infrastructure are more accessible in the central portion of the LRT 1A alternative alignment, between the Shady Oak Station and the West Lake Station. Over 100 bus stops are located within a quarter-mile of the proposed alignment, served by 7 Metro Transit bus routes. In addition to these 100 bus stops, one park and ride facility, the Hopkins Transit Center off of Excelsior Boulevard, comprises the primary transit infrastructure in this region. The primary transit routes providing regular service to the identified bus stops identified include Metro Transit Routes 12, 17, 604, 615, 664, 665, and 668. Of these, Routes 12 and 17 provide daily local service between Hopkins, St. Louis Park and downtown Minneapolis. Most of the existing transit services operate on Excelsior Boulevard, TH 7, and Minnetonka Boulevard, with some suburban circulating loop services (Routes 604 and 615) serving as connections between trunk bus routes including Routes 9, 12, and 17, along with making connections to park and ride facilities and retail centers such as Ridgedale Shopping Center with the downtowns of Hopkins and St. Louis Park. Excelsior Boulevard, TH 7, and Minnetonka Boulevard generally parallel the proposed alignment through Hopkins and St. Louis Park, with transit service also available along perpendicular cross streets such as Blake Road, Louisiana and Wooddale Avenues.

The Route 604, a circulating loop service on Louisiana Boulevard between the Vernon Avenue park and ride and the Excelsior and Grand residential and shopping center. Along with this route, the Route 615 is also a suburban loop route with intra-community services between Minnetonka, Hopkins, and St. Louis Park, connecting major shopping destinations including Ridgedale Shopping Center, Knollwood Mall, and Excelsior and Grand.

Four Metro Transit routes supply express service between downtown Minneapolis and many of the bus stops in the central portion of Alternative 1A during the weekday morning and afternoon/evening peak periods. Metro Transit Routes 664, 665, and 668 are all weekday express routes operating between Minnetonka, Hopkins and downtown Minneapolis with non-stop service on TH 169, TH 100 and I-394. In addition to these three routes, Metro Transit's Route 670 also provides express service to this region, however this route is located just outside the Study Area, and also provides service into the western region of Minnetonka, outside the presumed travel-shed of the Southwest LRT.

Finally, transit accessibility may be considered moderate along the eastern portion of the LRT 1A alternative between the West Lake Station and the Intermodal Station in downtown Minneapolis. Over 70 bus stops are located within a quarter-mile of the alternative, all of which are open air, curbside and street corner stops, without bus shelters, or public furniture. The primary transit service operating in proximity to the LRT 1A alternative in this region is Metro Transit's Route 25 bus. The Route 25 provides regular weekday service and service on Saturdays, albeit at reduced service frequencies. The route weaves through neighborhood

streets and around Cedar Lake and Lake of the Isles, following Sunset Avenue, Cedar Lake Parkway, West Lake of the Isles Parkway, 21st Street, Sheridan Avenue, Penn Avenue and Douglas Avenue, with service eventually through downtown Minneapolis up to the Northtown Transit Center in Spring Lake Park, Minnesota. The Route 25's southern end-of-line is located at the intersection of France Avenue and West Lake Street, a short distance from the proposed West Lake Station. The route would likely be capable of providing service to the West Lake and 21st Street stations.

In addition to the Route 25, transit service is provided on streets both east and west of the proposed Alternative 1A alignment, but at a distance well beyond one-half mile. The Route 9 bus provides service to the Bryn-Mawr neighborhood of Minneapolis on the north side of I-394. This route operates at 15 minute headways during the peak periods and 30 minutes in the off-peak periods. The Route 9 bus, in the current route alignment, would be the bus route most likely re-routed to serve the Penn and Van White Stations. Hennepin Avenue is served by multiple transit routes including the high-frequency Route 6, the Routes 12, 17, and 114. As noted, these are some of the primary transit routes providing service between Minnetonka, Hopkins, and St. Louis Park with Minneapolis. To the west of the alignment on the northern side of I-394, Metro Transit's Route 9 bus provides regular weekday and weekend service. The Route 9 bus operates at 15 minute peak period headway frequencies and 30 minute headways in the off peak periods. Transportation land uses such as I-394 act as a barrier to access for many residents living on either side of the freeway, and can discourage people's willingness to use transit if they are required to travel into downtown Minneapolis to transfer to outbound buses.

Near the LRT 1A alternative end-of-line in downtown Minneapolis, existing transit service in the downtown area is robust, with transit provided on most downtown streets, and future plans for the enhancement of transit networks throughout downtown are being implemented. Around the proposed Royalston Station, the Route 22 along with high-frequency routes 19 and Route 5 are operating on Olsen Memorial Highway and West 7th Street. These routes provide service to several bus stops in proximity of the station and the LRT 1A alternative alignment and throughout downtown. The 5th Street Transit Center, located in downtown Minneapolis' Garage B, is a heavily used transit terminal with several high-frequency express and local bus routes connect and allow passengers to transfer between buses and transportation modes. The terminal provides access to taxis, the Minneapolis skyway system, and the Hiawatha LRT.

The Royalston Station is strategically important toward achieving the objective of reverse commute travel within the corridor. The station is situated next to 7th Street North, which is served by Metro Transit's Route 5 and Route 19 bus lines, two of the regional transit system's designated high-frequency routes with service between north and south Minneapolis, and points beyond. Both of these routes are among the highest performing routes within Metro Transit's system, operating at 5-8 minute service headways throughout the day. For residents of North Minneapolis, Robbinsdale, and Brooklyn Center who work in St. Louis Park, Hopkins, Minnetonka or Eden Prairie the Royalston Station would provide a direct connection between these bus routes and the Southwest LRT. The circuitous street grid design and physical barriers can limit the operational efficiency of both routes from providing area residents with a travel time competitive transit service. As a result, passengers are required to travel into downtown to access buses with service to the southwest metropolitan region. Trips to downtown can take 20 minutes or more, depending on boarding location, from neighborhoods adjacent to downtown Minneapolis. Implementation of LRT service through this region would improve travel times for

area residents, and provide a seamless connection with the regional transitway network. In addition to the Royalston Station, the proposed residential and commercial development planned by the City of Minneapolis around the Penn and Van White Stations would also necessitate transit services to this community.

LRT 3A – A mixture of express and local bus routes offer service in proximity to the LRT 3A alternative from the Mitchell Station in Eden Prairie to the Intermodal Station in downtown Minneapolis. While more transit services and facilities operate in proximity to the LRT 3A alternative as compared to the LRT 1A alternative, the availability of transit service throughout the day and on weekends is relatively mixed. Most of the current services from Eden Prairie operate as weekday peak period express services, with inbound morning trips and outbound evening trips. While services operating in proximity to the LRT 3A alternative are operating efficiently, gaps in service exist, presenting an opportunity for improved services and facilities.

Within a quarter-mile radius of the proposed LRT 3A alternative, more than 200 bus stops are served by approximately 19 bus routes. The principal bus routes providing service around the LRT 3A alternative are Metro Transit routes 12, 17, 25, 664, 665, and 668, along with SouthWest Transit routes 680, 685, 690, and 698.

Transit service and supportive infrastructure on the southwestern portion of the LRT 3A alternative is stronger as compared to the western portion of the LRT 1A alternative, and may be considered moderate. The southwestern portion of the LRT 3A alternative, between the Shady Oak and Mitchell Stations, stretches through the Opus II office complex area, the “Golden Triangle,” and the Eden Prairie Town Center area. A total of 31 bus stops are scattered throughout this portion of the Alternative, the majority of which are open air curbside stops without sheltered waiting areas, public furniture, or traveler amenities. Most of the bus routes serving these stops provide service to regional destinations or park and ride facilities, and are largely intended to serve commuting travelers. Stops are located off of major regional roads including Technology Drive, Prairie Center Drive, Valley View Road, Shady Oak Road, Flying Cloud Drive, and Bren Road. Several stops are clustered around the Shady Oak Station with service provided by Metro Transit, and the remaining bus stops predominantly located in Eden Prairie and served by SouthWest Transit.

As described, the majority of SouthWest Transit services are express, line-haul coach buses operating between Eden Prairie, downtown Minneapolis, and the University of Minnesota. These routes include the 603, 680, 684, 685, 690, 691, 692, 693, 694, 695 and 698, along with some service variations for selected routes. These routes provide mostly weekday service during the peak periods, with some services operating during the off-peak periods to downtown Minneapolis and the U of M. Among the express services offered by SouthWest Transit, Route 684 is a reverse commute express route operating westbound in the morning and eastbound in the evenings, with peak period headways of 45 minutes between buses. The route operates along I-35W, TH 62, and TH 212 between Gateway in downtown Minneapolis and the East Creek Station in Chaska, with stops at the Southwest Station, the Golden Triangle region, and Southdale shopping center. While the route is marketed as a reverse commute route, some off-peak eastbound service is provided in the morning and early afternoons between 9:30 AM and 3:30 PM. Operating Monday through Friday, the route provides 6 westbound and 3 eastbound buses in the morning and 9 eastbound buses in the evening. Route 684 represents the consolidation Routes 631, 681, and 683.

Local fixed-route and circulating loop service in Eden Prairie, Chaska, and Chanhassen is also provided to bus stops and park and ride facilities within one-quarter mile of the LRT 3A alignment. Route 603 is a circulating loop route connecting the Southwest Station park and ride, the Eden Prairie Town Center, and the Hennepin Technical College among other destinations in Eden Prairie. This route operates throughout the day at 30 to 45 minute headways in the peak periods, and at 40 to 50 minute service headways in the off peak periods. In the morning, the route operates in a clockwise direction from Southwest Station, and in the afternoon, the route operates in the counter clockwise direction. Operating on Saturdays only, Route 693 provides circulating loop service in Eden Prairie, along with a connection to Southdale Mall.

While transit services are currently provided in proximity to the proposed stations, these services are predominantly limited stop and express routes operating during peak periods only. In the case of the Mitchell, Golden Triangle, and Opus stations, transit services pass by the proposed station areas, but no bus stops are currently located within a one-quarter mile radius of these stations. This would require modifications to the existing transit service in order for passengers to transfer between modes and routes to access regional destinations.

Along the central portion of the LRT 3A alternative, accessibility to transit services and supportive infrastructure is considered to be moderate, but better than the southwestern portion described above. Between the Shady Oak and West Lake Stations, current bus services are a mixture of express and local services operating on Excelsior Boulevard, TH 7, and Minnetonka Boulevard. Some suburban circulating loop services are available, connecting trunk bus routes including Metro Transit Routes 9, 12, and 17, along with establishing connections between retail centers such as Ridgedale Shopping Center, park and ride facilities, and the downtowns of Hopkins and St. Louis Park. Excelsior Boulevard, TH 7, and Minnetonka Boulevard generally parallel the proposed alignment through Hopkins and St. Louis Park, with transit service also available along perpendicular cross streets such as Blake Road, Louisiana and Wooddale Avenues. More than 100 bus stops are located within a quarter-mile of the proposed alignment, along with one park and ride facility, the Hopkins Transit Center off of Excelsior Boulevard. Of all the bus stops along this portion of the alignment, 10 are equipped with weather-shielding bus shelters and waiting areas.

As the LRT 3A alternative alignment moves from west to east, the volume and frequency of transit services to bus stops continues to increase. The primary transit routes providing regular service to bus stops along the central portion of the line include Metro Transit Routes 12, 17, 604, 615, 664, 665, and 668. Of these, Routes 12 and 17 provide daily local service between Hopkins, St. Louis Park and downtown Minneapolis. The primary east-west path of the Route 12 is Excelsior Boulevard, while the Route 17 bus provides local service via Hennepin Avenue, Texas Avenue, Minnetonka Boulevard, and TH 7. Additionally, bus stops located closer to the Minneapolis border with St. Louis Park have the highest volumes of weekday and weekend trips as other bus routes operating outside the project Study Area begin to congregate in the midtown area of Minneapolis.

The Route 604 is a circulating loop service on Louisiana Boulevard between the Vernon Avenue park and ride and the Excelsior and Grand residential and shopping center. The Route 615 is also a suburban loop route with intra-community services between Minnetonka, Hopkins, and St. Louis Park, connecting major shopping destinations including Ridgedale Shopping Center, Knollwood Mall, and Excelsior and Grand.

Four Metro Transit routes supply express service between downtown Minneapolis and many of the bus stops in the central portion of Alternative 3A during the weekday morning and afternoon/evening peak periods. Metro Transit Routes 664, 665, and 668 are all weekday express routes operating between Minnetonka, Hopkins and downtown Minneapolis with non-stop service on TH 169, TH 100 and I-394. In addition to these three routes, Metro Transit's Route 670 also provides express service to this region, however this route is located just outside the Study Area, and also provides service into the western region of Minnetonka, outside the presumed travel-shed of the Southwest LRT.

For the eastern portion of the LRT 3A alternative alignment, transit accessibility may be considered moderate. From the West Lake Station to the Intermodal Station, over 70 bus stops are located within a quarter-mile of the alternative, all of which are open air, curbside and street corner stops, without bus shelters, or public furniture. Downtown Minneapolis transit facilities are equipped with more rider amenities, the result of higher usage and more frequent service.

The primary transit services operating in proximity to the LRT 3A alternative on the eastern portion of the alignment are Metro Transit's Route 12, 17, and 25 which provide regular weekday service. As noted, these are some of the primary transit routes providing service between, Minnetonka, Hopkins, and St. Louis Park with Minneapolis. The Route 12 and 17 buses would be capable of serving this station, and the Route 21 and 23 buses would also be re-routed to connect with the station, enhancing connections between the greater transit network and the LRT. To the west of the alignment on the northern side of I-394, Metro Transit's Route 9 bus provides regular weekday and weekend service. The Route 9 bus operates at 15 minute peak period headway frequencies and 30 minute headways in the off peak periods. Transportation land uses such as I-394 act as a barrier to access for many residents living on either side of the freeway, and can discourage people's willingness to use transit if they are required to travel into downtown Minneapolis to transfer to outbound buses.

Near the Alternative 3A end-of-line in downtown Minneapolis, existing transit service in the downtown area is robust, with transit provided on most downtown streets, and future plans for the enhancement of transit networks throughout downtown are being implemented. Around the proposed Royalston Station, the Route 22 along with high-frequency routes 19 and Route 5 are operating on Olsen Memorial Highway and West 7th Street. These routes provide service to several bus stops in proximity of the station and the LRT 3A alternative alignment and throughout downtown. The 5th Street Transit Center, located in downtown Minneapolis' Garage B, is a heavily used transit terminal with several high-frequency express and local bus routes connect and allow passengers to transfer between buses and transportation modes. The terminal provides access to taxis, the Minneapolis skyway system, and the Hiawatha LRT.

The Royalston Station is strategically important toward achieving the objective of reverse commute travel within the corridor. According to the ridership modeling, reverse commute ridership boardings at the Royalston Station are strongest for the LRT 3A alternative among the three LRT alternatives that would serve the Royalston Station. The station is situated next to 7th Street North, which is served by Metro Transit's Route 5 and Route 19 bus lines, two of the regional transit system's designated high-frequency routes with service between north and south Minneapolis, and points beyond. Both of these routes are among the highest performing routes within Metro Transit's system, operating at 5-8 minute service headways throughout the day. For residents of North Minneapolis, Robbinsdale, and Brooklyn Center who work in St. Louis Park, Hopkins, Minnetonka or Eden Prairie the Royalston Station would provide a direct

connection between these bus routes and the Southwest LRT. Without this link, passengers must travel “out-of-their-way” to access transit services in downtown to commute to the southwest metropolitan region. This requirement deters many from using transit to access the job centers in Minnetonka and Eden Prairie. The circuitous street grid design and physical barriers can limit the operational efficiency of both routes from providing area residents with a travel time competitive transit service. As a result, passengers are required to travel into downtown to access buses with service to the southwest metropolitan region. Trips to downtown can take 20 minutes or more, depending on boarding location, from neighborhoods adjacent to downtown Minneapolis. Implementation of LRT service through this region would improve travel times for area residents, and provide a seamless connection with the regional transitway network. In addition to the Royalston Station, the proposed residential and commercial development planned by the City of Minneapolis around the Penn and Van White Stations would also necessitate transit services to this community.

LRT 3C-1 (Nicollet Mall) – Similar to the LRT 3A alternative, bus routes providing service to bus stops, park and rides, or transit centers in proximity to the LRT 3C-1 (Nicollet Mall) alternative are a mixture of express, local, and circulating loop services. However, the proposed alignment of the LRT 3C-1 alternative would route the train through the midtown and downtown regions of Minneapolis, areas considered to be saturated transit markets. Of the four LRT alternatives, both the LRT 3C-1 (Nicollet Mall) and LRT 3C-2 (11th/12th Street) alternatives have the most interaction and duplication with the existing transit network.

Existing transit services surrounding the LRT 3C-1 (Nicollet Mall) alternative are more abundant than the other three LRT alternatives being considered. The LRT 3C-1 alternative is the same as the LRT 3A alternative from the Mitchell Station to the West Lake Station. Beyond the West Lake Station, the train would use a portion of the Midtown Corridor in Minneapolis and also travel both under and on Nicollet Avenue and Nicollet Mall in downtown Minneapolis. Existing transit services in both the midtown and downtown regions of Minneapolis are robust. The following section describes the current transit services and supporting infrastructure found in proximity to the LRT 3C-1 alternative from the Mitchell Station in Eden Prairie to downtown Minneapolis.

Transit service and supportive infrastructure on the southwestern portion of the LRT 3C-1 alternative is stronger as compared to the western portion of the LRT 1A alternative, and may be considered moderate. The southwestern portion of the LRT 3C-1 alternative, between the Shady Oak and Mitchell Stations, stretches through the Opus II office complex area, the “Golden Triangle,” and the Eden Prairie Town Center area. A total of 31 bus stops are scattered throughout this portion of the Alternative, the majority of which are open air curbside stops without sheltered waiting areas, public furniture, or traveler amenities. Most of the bus routes serving these stops provide service to regional destinations or park and ride facilities, and are largely intended to serve commuting travelers. Stops are located off of major regional roads including Technology Drive, Prairie Center Drive, Valley View Road, Shady Oak Road, Flying Cloud Drive, and Bren Road. Several stops are clustered around the Shady Oak Station with service provided by Metro Transit, and the remaining bus stops predominantly located in Eden Prairie and served by SouthWest Transit.

As described, the majority of SouthWest Transit services are express, line-haul coach buses operating between Eden Prairie, downtown Minneapolis, and the University of Minnesota. These routes include the 603, 680, 684, 685, 690, 691, 692, 693, 694, 695 and 698, along with some service variations for selected routes. These routes provide mostly weekday service

during the peak periods, with some services operating during the off-peak periods to downtown Minneapolis and the U of M.

Among the express services offered by SouthWest Transit, Route 684 is a reverse commute express route operating westbound in the morning and eastbound in the evenings, with peak period headways of 45 minutes between buses. The route operates along I-35W, TH 62, and TH 212 between Gateway in downtown Minneapolis and the East Creek Station in Chaska, with stops at the Southwest Station, the Golden Triangle region, and Southdale shopping center. While the route is marketed as a reverse commute route, some off-peak eastbound service is provided in the morning and early afternoons between 9:30 AM and 3:30 PM. Operating Monday through Friday, the route provides 6 westbound and 3 eastbound buses in the morning and 9 eastbound buses in the evening. Route 684 represents the consolidation Routes 631, 681, and 683.

Local fixed-route and circulating loop service in Eden Prairie, Chaska, and Chanhassen is also provided to bus stops and park and ride facilities within one-quarter mile of the LRT 3C-1 alignment. Route 603 is a circulating loop route connecting the Southwest Station park and ride, the Eden Prairie Town Center, and the Hennepin Technical College among other destinations in Eden Prairie. This route operates throughout the day at 30 to 45 minute headways in the peak periods, and at 40 to 50 minute service headways in the off peak periods. In the morning, the route operates in a clockwise direction from Southwest Station, and in the afternoon, the route operates in the counter clockwise direction. Operating on Saturdays only, Route 693 provides circulating loop service in Eden Prairie, along with a connection to Southdale Mall.

While transit services are currently provided in proximity to the proposed stations, these services are predominantly limited stop and express routes operating during peak periods only. In the case of the Mitchell, Golden Triangle, and Opus stations, transit services pass by the proposed station areas, but no bus stops are currently located within a one-quarter mile radius of these stations. This would require modifications to the existing transit service in order for passengers to transfer between modes and routes to access regional destinations.

Access to transit services and infrastructure is more readily available along the central portion of Alternative 3C, between the Shady Oak and West Lake Stations. Most of the existing transit services operate on Excelsior Boulevard, TH 7, and Minnetonka Boulevard, with some suburban circulating loop services connecting trunk bus routes such as Metro Transit Routes 9, 12, and 17, along with retail centers, the downtowns of Hopkins and St. Louis Park, and park and ride facilities along I-394. Excelsior Boulevard, TH 7, and Minnetonka Boulevard generally parallel the proposed alignment through Hopkins and St. Louis Park, with transit service also available along perpendicular cross streets such as Blake Road, Louisiana and Wooddale Avenues. More than 100 bus stops are located within a quarter-mile of the proposed alignment, along with one park and ride facility, the Hopkins Transit Center off of Excelsior Boulevard. Of all the bus stops along this portion of the alignment, 10 are equipped with weather-shielding bus shelters and waiting areas.

From west to east, transit service increases in volume and service frequency with regard to the number of trips made to each bus stop in the analysis region. Bus stops located closer to the Minneapolis border with St. Louis Park have the highest volumes of weekday and weekend trips. The primary transit routes providing regular service to the identified bus stops identified include Metro Transit Routes 12, 17, 604, 615, 664, 665, and 668. Of these, Routes 12 and 17

provide daily local service between Hopkins, St. Louis Park and downtown Minneapolis. The primary east-west path of the Route 12 is Excelsior Boulevard, while the Route 17 bus provides local service via Hennepin Avenue, Texas Avenue, Minnetonka Boulevard, and TH 7.

The Route 604 is a circulating loop service on Louisiana Boulevard between the Vernon Avenue park and ride and the Excelsior and Grand residential and shopping center. The Route 615 is also a suburban loop route with intra-community services between Minnetonka, Hopkins, and St. Louis Park, connecting major shopping destinations including Ridgedale Shopping Center, Knollwood Mall, and Excelsior and Grand.

Four Metro Transit routes supply express service between downtown Minneapolis and many of the bus stops in the central portion of Alternative 3C during the weekday morning and afternoon/evening peak periods. Metro Transit Routes 664, 665, and 668 are all weekday express routes operating between Minnetonka, Hopkins and downtown Minneapolis with non-stop service on TH 169, TH 100 and I-394. In addition to these three routes, Metro Transit's Route 670 also provides express service to this region, however this route is located just outside the Study Area, and also provides service into the western region of Minnetonka, outside the presumed travel-shed of the Southwest LRT.

Existing transit service is the strongest along the eastern portion of the LRT 3C-1 alternative, and the market is considered to be heavily saturated. Existing service paralleling the Midtown Corridor within one-quarter mile of the proposed Alternative 3C alignment is provided along Lake Street. Bus service is also provided on the cross streets of Hennepin, Lyndale, and Nicollet Avenues. The primary east-west service in the analysis region is Metro Transit's Route 21 bus with service between Minneapolis' Uptown region and downtown St. Paul. Metro Transit's Route 53 bus is an express service operating only during the weekdays following the same route, with service to downtown St. Paul. As one of Metro Transit's high-frequency routes, the Route 21 bus makes approximately 234 weekday trips (115 eastbound, and 118 westbound), 267 Saturday trips, and 186 Sunday trips. During the weekday peak periods, the Route 21 service frequency equates to approximately 8 bus trips per hour in both directions. The Route 53 bus operates only on weekdays, providing express service along the same corridor, which runs from the Uptown neighborhood of Minneapolis to downtown St. Paul. Route 53 provides 56 weekday trips.

In addition to these two routes, the major cross streets mentioned above also provide high levels of transit service throughout the Midtown Corridor area. Along Hennepin Avenue, the Route 6 bus is a high frequency transit service, making 222 weekday trips, operating at 5-7 minute headways during the peak hours. During the peak hours, approximately 24 or more buses per hour travel through the corridor in both directions. Also traveling along Hennepin Avenue are the Route 17 and Route 12 buses. Hennepin Avenue and the Uptown Transit Center are also served by SouthWest Transit and express bus routes to the University of Minnesota. The Uptown Transit Center is located on Hennepin Avenue between 28th Street and Lagoon Avenue.

On Lyndale Avenue, the Route 4 bus runs at 7-15 minute headways during the weekday peak periods, 15 minutes during off-peak times, and 15-30 minutes during the evening hours, providing local service daily. Like Hennepin Avenue, Lyndale is also served by an express bus route, the Route 113, with weekday service during the academic year to the U of M. These local

streets run directionally north-south and are spaced approximately one-half mile sequentially from one another.

The LRT 3C-1 (Nicollet Mall) and LRT 3C-2 (11th/12th Street) alternatives include stations along the Midtown Corridor at Hennepin and Lyndale Avenues, and below Nicollet Avenue at 28th Street and Franklin Avenues. The LRT 3C-1 (Nicollet Mall) alternative includes stations at 12th, 8th, and 4th Streets on Nicollet Mall. Bus stops are currently located at or around each of the proposed station areas. The proposed station platform at Hennepin Avenue would connect to the Uptown Transit Station. The transit station and bus stops would allow for connections to the existing transit network described above. Approximately 60 bus stops are located within one-quarter mile of the stations along the Midtown Corridor. 14 bus stops are located around the proposed Hennepin Avenue station, 12 around the proposed Lyndale Avenue station, 7 around the proposed 28th Street station, and 15 stops around the proposed Franklin Avenue station. In downtown Minneapolis, more than 100 bus stops are located within a quarter-mile of Nicollet Mall and crossing streets. Nicollet Mall is currently one of the central transit routes for the entire city. Between 17 and 20 bus routes travel on segments of Nicollet Mall throughout the day, some of which are designated as high-frequency routes. While express bus service will shift to Marquette and 2nd Avenues in the immediate future, Nicollet Mall is still planned to carry local bus service.

LRT 3C-2 (11th/12th Street) - As an alternative end-of-line option in downtown Minneapolis, the LRT 3C (11th/12th Street) proposes to use either Blaisdell Avenue, Nicollet Avenue, or 1st Avenue between the Midtown Corridor and Franklin Avenue. Both Blaisdell and 1st Avenues parallel Nicollet Avenue and are within the one-quarter mile analysis area established for this analysis. Existing transit services in proximity to these streets are the same as those described for the eastern portion of the LRT 3C-1 (Nicollet Mall) alternative above.

The LRT 3C-2 (11th/12th Street) would connect Nicollet Avenue and Royalston Avenue via a one-way couplet pair on 11th and 12th Streets between Nicollet and Glenwood Avenues. Both 11th and 12th Streets in downtown Minneapolis are heavily used by existing transit services, primarily for east-west travel through downtown and the entrance and exit ramps to I-394, and are crucial links to the soon-to-be opened Marquette and 2nd Avenue double-width, contra-flow bus lanes. Up to 90 peak hour express trips are scheduled to travel on 11th Street between Marquette and Hawthorne Avenue. A similar volumes of peak hour buses will use 12th Street, between the I-394 exit ramp and Hennepin Avenue. Bus stops are located along both 11th and 12th Streets and served by Metro Transit, Plymouth Metrolink, BlueXpress (with service to and from Prior Lake and Shakopee, Minnesota) and SouthWest Transit.

2.2.5.1 Analysis by LRT Alternative Conclusions

LRT 1A – Transit accessibility in proximity to the exclusive segment of LRT 1A alternative may be characterized as low to moderate. Implementation of the LRT 1A alternative would result in providing a new transit service to regions either not served by transit or potentially underserved, and the risk of duplicating existing transit service would be minimal.

Transit service along the central and eastern portions of the LRT 1A alternative, from Shady Oak Station to the Intermodal Station are considered to be moderate. While service levels increase and supportive infrastructure are more abundant along these portions of the alignment, many of the current routes provide express service only during the peak hours. The implementation of LRT service could provide increased access to transit service to these

regions, along with creating a competitive travel option to the private automobile, helping to improve transit travel times and encourage greater transit use. In several cases, increasing the volume or frequency of the current bus services would not result in a travel time savings for transit users, nor an incentive to attract future riders. The circuitous design and sometimes narrow nature of neighborhood streets are less conducive to operating larger vehicles efficiently. This has the effect of increasing a passenger's travel time and potentially decreasing ridership. Increasing the number of buses or the frequency of buses on the route will not improve travel times, but rather may lead to excessive costs without sufficient gain.

However, the existing land use patterns and socioeconomic characteristics along the western alignment of the LRT 1A alternative in Minnetonka and Eden Prairie suggest that this region is not a high transit trip generator. The existing bus service operating characteristics, coupled with the Transit Market Index (TMI) analysis results conducted for this memorandum, further suggest that this region is unlikely to generate more transit trips in the near future..

LRT 3A – Accessibility to transit services and facilities in proximity of the LRT 3A alternative is considered to be moderate. Implementation of the LRT 3A alternative would result in providing a new high-frequency transit service to regions principally served by express bus service, and the risk of duplicating existing transit service would be minimal. The LRT 3A alternative provides a direct connection to major employment destinations in the corridor such as downtown Minneapolis, Opus II, the “Golden Triangle,” and Eden Prairie Town Center. The ability of the alignment to be interlined with the Hiawatha LRT or future Central Corridor LRT would enable Southwest trains to connect with other major regional destinations beyond the Southwest LRT Study Area. The addition of the LRT would enhance connections between regional destinations, and while intended to provide a commuter-focused transit service, would enable more localized transit services and options.

LRT 3C-1 (Nicollet Mall) and LRT 3C-2 (11th/12th Street) – Transit accessibility within proximity of both the LRT 3C-1 (Nicollet Mall) and LRT 3C-2 (11th/12th Street) alternatives are considered high. As compared to the LRT 1A and LRT 3A alternatives, the LRT 3C-1 alternative has the greatest interaction and duplication with the existing transit network. As noted, the region of Minneapolis both the LRT 3C-1 and LRT 3C-2 alternatives would serve has the highest rates of regular transit use for the city. Construction and operation of either alternative would likely impose several challenges to the existing transit services, along with operational challenges to planned service improvements.

Transit Service Duplication

The introduction of high-frequency LRT service would likely complement rather than duplicate existing services operating in or around the LRT 1A or 3A alternatives. Several routes operated by SouthWest Transit provide intercity line-haul express service between Eden Prairie and downtown Minneapolis, and Metro Transit operates a mixture of local and express routes between Minnetonka, Hopkins, St. Louis Park, and Minneapolis. Express service primarily is mostly peak period, peak direction travel. The express service is potentially in direct competition with proposed LRT service and service restricting should be evaluated after the selection of the LPA. The LRT would provide shorter trips between stations in Eden Prairie and Minnetonka. In turn, the LRT would also be supported by feeder buses, helping to enhance transit connections to regions outside the Study Area. Furthermore, the extension of existing routes to serve LRT stations would help to increase regional mobility. By example, extension of the Route 17 to the

Blake Station would enable residents of North Minneapolis to access jobs and shopping activities in Hopkins, Minnetonka and Eden Prairie. Similarly, Metro Transit Routes 5 and 19 could connect with the Royalston Station, offering residents of North Minneapolis a reverse commute option to connect them with the job centers in the southwest metropolitan region and rail service into downtown Minneapolis, with connections to St. Paul, the Mall of America, and the Minneapolis-St. Paul International Airport.

In midtown and downtown Minneapolis, implementation of either the LRT 3C-1 (Nicollet Mall) or LRT 3C-2 (11th/12th Street) alternative could have several implications to existing and programmed future transit services. Implementation of LRT service in these regions would provide parallel transit service to an area already served by a high volume of transit service, and in some cases duplicate existing transit services. Providing parallel and duplicate transit service can result in higher capital operating costs borne by the public and operating agency, and the sub-optimal allocation and utilization of resources. Ideally, transit service planners seek to minimize service duplication where it occurs in effort to minimize costs and maximize a transit network's operational utility. The Metropolitan Council's Transportation Policy Plan, under Policy 13: A Cost-Effective and Attractive Regional Transit Network lists Strategy 13a: Coordination Among Services, which states "The Council will promote coordination among the different transit services provided by various authorities throughout the region to ensure that the overall regional transit system functions as a seamless and user-friendly regional network, and to avoid inefficiencies and duplication."⁵ The LRT 3C-1 (Nicollet Mall) and LRT 3C-2 (11th/12th Street) alternatives appear to be inconsistent with this policy due to redundant, duplicative service.

All transit services are produced and scheduled according to service demand. Service duplication occurs when two or more transit routes operate on the same roadways during the same revenue service hours and serve common origins and destinations. In some cases, service duplication is desirable or unavoidable, such as the location of a major activity center destination or the lack of an alternate routing option. However, the cost and resource utilization associated with providing parallel or duplicate transit service can increase the risk of marginalized rates of return with respect to system ridership and ridership growth potential, resource allocation and utilization, and revenue generation or investment return.

In addition to the cost implications, service duplication can also have resource allocation and utilization implications. Specifically, if two or more transit routes provide parallel or duplicate service, and serve similar destinations, experience has shown that passengers will typically select the route that minimizes their travel times and best satisfies their travel needs or preferences, and are unlikely to transfer between routes or modes for short distances. For example, passengers beginning their trip at the South Bloomington Transit Center destined for Nicollet Mall on the Route 18 bus would be more likely to remain on the bus and not transfer to the LRT because the time lost in transferring between modes would increase their travel time. Duplication also presents added operational challenges. Because the proposed LRT alignment parallels short portions of several existing routes and does not replace a bus route entirely, the current bus system would need to be maintained in order to serve transit users accessing destinations between each station. Restructuring the current bus routes to connect with the LRT or to operate on other streets would reduce access to destinations already served. Altering the frequencies or restructuring the bus routes could affect the travel patterns and behaviors of current users in the area service is duplicated or, perhaps more importantly, affect outer market

⁵ Metropolitan Council 2030 Transportation Policy Plan, Page 100

users coming from points outside of the area where the two alignments would parallel one another. Experience has shown that service modifications can impact transit ridership. For example, even with the LRT operating below and at-grade along Nicollet Avenue, the Route 18 would still need to provide service along its current route at current service frequencies in order to provide sufficient access to destinations between 28th Street and Franklin Avenue. This presents two scenarios. Passengers using the Route 18 would be unlikely to transfer to the LRT because of the “transfer penalty” and because the bus would access more destinations than LRT. If the Route 18 bus were re-routed to an alternate street, access to current destinations would be changed, both in downtown and in outer markets, likely resulting in outer market transit passengers having to change their trip making behavior.

In general, transit service currently operating in the midtown and downtown regions of Minneapolis is robust. A triangle of high-frequency transit routes currently operate on Hennepin Avenue (Route 6), Lake Street (Route 21), and Nicollet Avenue (Route 18). The Route 18 and Route 21 buses are two of the most heavily used routes within the entire Metro Transit system. In addition to these routes, other local and express bus services also operate regularly on these same streets, and on Lyndale Avenue, Franklin Avenue, Nicollet Mall, and all downtown streets. As displayed by the results of the TMI in Figure 2 and the existing network characteristics displayed in Figure 4, this triangular area of Minneapolis is considered a saturated transit market. The implementation of a new, high-frequency LRT service could have several implications to the existing and programmed future transit services in midtown and downtown Minneapolis. As discussed, these implications revolve around the cost associated with implementing and operating the LRT relative to the potential ridership and the transit market served, the need to maintain the existing bus service under current operating characteristics, displacement of bus service on Nicollet Mall, and implications to the operational efficiency of the Marquette and 2nd Avenue Transit Project (MARQ2).

LRT 3C-1 (Nicollet Mall) and LRT 3C-2 (11th/12th Street) alternatives would provide duplicate service in an area considered to be a saturated transit market. Figure 6 displays the LRT alternative alignments overlaid on the weekday transit trip volumes by bus route segment. While LRT service along the Midtown Corridor and into downtown via Nicollet Avenue (or the Blaisdell Avenue and 1st Avenue options under the LRT 3C-2 (11th/12th Street) alternative) would increase transit capacities along these corridors, the addition of LRT could result in an oversaturation of transit service to these areas. The existing transit service operating through the midtown region has been designed and scheduled to satisfactorily meet the service demand. Currently, buses operate at 5 to 10 minute service headways during the peak periods on Nicollet Avenue, equating to approximately 12 buses per hour, bi-directionally. LRT service operating at 7.5 minute service headways during the peak periods equates to 8 trains per hour, bi-directionally. For the area along Nicollet Avenue and Nicollet Mall the LRT would parallel, this equates to approximately 22 transit vehicle trips per hour. On Lake Street, the Route 21 provides service at 10 to 15 minute service headways during both the peak and off-peak periods, or approximately 6 buses per hour bi-directionally. Supplementing the Route 21 is the Route 53, a limited stop route operating at 20 to 30 minute headways during the peak periods, and therefore capable of providing up to 3 buses per hour, bi-directionally. Between these two bus routes, this equates to 9 bi-directional bus trips during the peak periods, and coupled with 8 LRT trips, equals 17 transit trips during the peak periods. In either case, the level of transit service provided by both modes on Lake Street, Nicollet Avenue, or Nicollet Mall could outpace the demand for service, resulting in a surplus of unused service. While the introduction of LRT

service would likely generate additional transit trips in these regions, the risk of diminishing returns is greater if supplied transit service outpaces demand.

Additionally, the LRT 3C-1 (Nicollet Mall) and LRT 3C-2 (11th/12th Street) alternatives would be incapable of replacing the existing bus network operating on Lake Street, Nicollet Avenue, or Nicollet Mall. Removing the existing bus service would disenfranchise current riders and the regions currently served. As noted, the Route 18 and Route 21 are two of the highest performing routes Metro Transit routes. These routes are characterized as providing numerous on-off short rides. For example, passengers who currently walk to the bus stops on Nicollet Avenue at 24th, 25th, or 26th Streets are served by a bus every 5 to 10 minutes. Replacing this service with LRT would reduce the frequency of service and would require passengers to walk to either 28th Street or Franklin Avenue. The station spacing under the LRT 3C-1 (Nicollet Mall) and LRT 3C-2 (11th/12th Street) alternatives would not adequately service the on-off trip behavior of area residents. Even if passengers are within a ½ mile radius of a station, the defined walkshed by the Metropolitan Council persons are willing to walk to access LRT service, the additional distance now required to walk to the station would likely be perceived as a disincentive to use transit. Additionally, if the bus provides service to a stop which is closer to the ultimate destination of a person's trip in downtown, the added walking distance from the LRT to a passenger's ultimate destination would likely also be seen as a disincentive, and passengers would be more likely to remain on the bus. Modifying the service frequency of the buses on Nicollet Avenue would be counter to the adopted Metropolitan Council policy for minimum service frequency in the Transit Market Area 1 region. Modifying the service frequency could also impose traveler inconveniences in outer-market regions the route serves.

Furthermore, because the alignment would parallel only short portions of the existing routes operating on these streets, the current bus service would need to be maintained in order to serve transit users accessing destinations on these streets between LRT stations. Unlike the Central Corridor LRT project, which will replace the limited stop Route 50 bus entirely and operate at a higher frequency level than the Route 50 currently, Southwest LRT trains would be adding additional high-frequency service on top of existing high-frequency service, with the buses operating at shorter headways. The existing bus service on Lake Street, Nicollet Avenue, and Nicollet Mall could not be replaced because of the need to serve destinations between the LRT stations, and modifications to service spans, frequencies, or alignments of the buses could affect the performance of these routes. Altering or restructuring the current bus service schedule, or relocating service to other streets would reduce access to destinations already served, likely affecting the travel behaviors of transit users. By example, the Route 18 bus would still have to provide service along its current route at current capacities in order to provide sufficient access to desired destinations between Lake Street and Washington Avenue. This presents two scenarios. Passengers using the Route 18 beginning at the South Bloomington Transit Center would be unlikely to transfer to the LRT at the 28th Street Station because they have a one seat ride to the same destination served by both modes, they would lose time transferring between modes, and because the bus would access more destinations than the LRT. If the bus were re-routed to an alternate street, access to current destinations would be changed, both in downtown and in outer markets, likely resulting in outer-market passengers having to change their trip making behavior.

Implementation of the LRT 3C-1 (Nicollet Mall) and LRT 3C-2 (11th/12th Street) alternatives could result in direct competition with adjacent bus routes for riders, resulting in impacts to ridership levels for the LRT, the bus routes, or both modes. As discussed above, if two or more

transit routes are co-located with one another, and serve similar destinations, experience suggests that passengers will choose the route that best serves their travel needs or preferences, and not transfer between routes or modes for short distances. For example, passengers traveling from the Uptown Transit Center destined for the Chicago Avenue Transit Center or points further east would be less likely to take the LRT and transfer to the bus when the bus offers them a one-seat ride between both destinations. Even if the train makes fewer stops and travels faster, the time required to transfer between the LRT and the bus would negate the travel time savings. Transit users would realize that one mode would satisfactorily complete their trip, and switching between modes would be unnecessary and burdensome. This could result in the bus maintaining most of the current ridership levels, and minimal gains in corridor ridership on the LRT. Conversely, passengers who could use either the train or the bus to reach the same destination, such as boarding at the 28th Street Station destined for 4th Street and Nicollet Mall, may switch to the LRT because of the faster service. This could result in the erosion of ridership on the Route 18, or splitting the ridership between modes (depending on a traveler's destination), imposing both cost and resource utilization concerns. As noted, the midtown and downtown Minneapolis areas are considered saturated transit markets with several high-frequency transit routes, suggesting that service is already provided to destinations that people wish to access.

In sum, the LRT 3C-1 (Nicollet Mall) and LRT 3C-2 (11th/12th Street) alternatives would provide duplicate service in the midtown Minneapolis region, paralleling existing high-frequency bus service in a saturated transit market. The existing bus service could not be replaced because of the need to serve destinations between stations, and route modifications to existing service frequencies or route restructuring to alternate streets would incur a disbenefit to existing riders and the area served. Duplicate service could result in the oversaturation of the transit market, and introduce a service that would compete with the existing routes for ridership. The LRT 1A and LRT 3A alternatives would provide transit service to areas of Minneapolis with limited existing service, and provide a more direct connection to rail service for north Minneapolis transit users and reverse commute option.

LRT Service Operating on Nicollet Mall, 11th & 12th Streets

According to *Access Minneapolis: Downtown Action Plan*, transit service in downtown Minneapolis is currently facing several challenges. The Plan identifies the growing volumes of bus trips, slow transit service, a confusing system, and the heavy concentration of north-south service as four primary challenges in downtown. According to the Plan, “Metro Transit projections for 2030 indicate that even if all proposed rail projects are built—Northstar, Southwest Corridor, Central Corridor—the number of bus trips flowing into the downtown during one PM peak hour will rise from 500 trips in 2005 to over 800 trips in 2030. This is an increase of 45 percent over current levels. If no rail projects are built, the number of bus trips will rise to over 900 trips for one PM peak hour, nearly doubling the number of buses in downtown.”⁶ The Plan also states that “Existing transit lanes, particularly the contra-flow lanes on Marquette and 2nd Ave. S., are very congested. This reduces transit service and impacts the reliability of transit service through downtown. Transit providers currently operate buses on many other streets in downtown to help address this issue. Many bus routes through downtown travel at less than five miles per hour and some less than typical walking speed.”⁷ Furthermore, the Plan describes the existing downtown transit network as being particularly confusing, especially for new transit riders, which is “largely due to the distribution of transit service throughout downtown, the predominantly one-way street system and the limited route and schedule information offered on the street.”⁸ Finally, the Plan discusses the heavy concentration of north-south service in downtown, stating “Bus service to and from downtown is concentrated in three primary directions: north-south, east-west, and from the southwest (Hennepin Avenue). Nearly half of the peak period bus trips in downtown are concentrated in the north-south spine.”⁹

The Marquette and 2nd Avenue Project (MARQ2) represents a major capital investment in downtown transit service also intended to improve transportation generally throughout downtown. Funded through the federal Urban Partnership Agreement (UPA), MARQ2 intends to consolidate commuter transit service in downtown Minneapolis through the creation of dual contra-flow bus lanes. Express bus service would be funneled onto these streets, with improved passenger amenities and facilities including sheltered waiting areas, wayfinding capabilities, schedule information, and improved sidewalks for both pedestrian flow and additional curb capacity for boarding queue space and bus alightings. The goal of this approach is to improve transit operational service, reliability, visibility, circulation, and increase bus capacity in the downtown core. During the peak hour periods, the dual bus lanes would be capable of handling over 180 buses per hour.

Implementation of LRT on Nicollet Mall could have several operational impacts to the existing transit network and to the MARQ2 project. The displacement of local bus service from Nicollet Mall resulting from the implementation of the LRT 3C-1 (Nicollet Mall) alternative would require the relocation of local buses to other downtown streets. This has the potential to impact the ridership of the local routes both in and outside of the downtown core area. According to *Access Minneapolis*, the alternate streets bus service would be forced to operate on are already operating near capacity, and the addition of the displaced bus routes would likely create capacity problems. If LRT and bus service were to be retained on Nicollet Mall, the street would

⁶ City of Minneapolis. *Access Minneapolis: Downtown Action Plan*. Pg. 17

⁷ City of Minneapolis. *Access Minneapolis: Downtown Action Plan*. Pg. 17

⁸ City of Minneapolis. *Access Minneapolis: Downtown Action Plan*. Pg. 18

⁹ City of Minneapolis. *Access Minneapolis: Downtown Action Plan*. Pg. 18

need to be widened significantly, resulting in the removal of sidewalk area. The operational planning for train service, coupled with the service plans, stop requirements and requests of the buses would likely be infeasible and inefficient. The conversion of Hennepin Avenue and 1st Avenues in downtown to two-way streets may also restrict further transit capacities on these streets as buses compete with more automobile traffic.

Construction of the LRT would likely preclude bicycle traffic on Nicollet Mall. This would be inconsistent with the goal of allowing bicycle traffic on Nicollet Mall regularly as outlined in *Access Minneapolis*. In order for bicycles and LRT to be co-located on Nicollet Mall, portions of the pedestrian walkway would need to be removed, impacting both pedestrian movement and business activities. The relocation of bus service from Nicollet Mall would also conflict with adopted city policy establishing a free fare zone on Nicollet Mall. Under an agreement negotiated with downtown businesses, local buses are intended to operate as downtown shuttles from Washington Avenue on the north end of Nicollet Mall to Grant Street at the southern end near the Minneapolis Convention Center. Nicollet Mall buses terminating downtown would be free for those boarding within downtown. The intent of this is to allow pedestrians at any point to use any bus to travel on Nicollet Mall between Washington Avenue and Grant Street.

The LRT 3C-2 (11th/12th Street) would use a short portion of Nicollet Mall between Grant Street and 11th Street, and traveling as a one-way couplet pair on 11th and 12th Streets between Nicollet Mall and Glenwood Avenue. The placement of LRT on 11th and 12th Streets would require the removal of one lane of traffic on both of these streets, and likely the removal of some on-street parking. This would result in disruptions to traffic operations on these streets, reducing the throughput capacity, and impacting the efficiency of the MARQ2 transit project. Both 11th and 12th Streets are heavily used by existing automobile and bus traffic. According to Mn/DOT, current Average Annual Daily Traffic (AADT) volumes for 11th and 12th Streets suggest that approximately 15,000 to 18,000 vehicles use these streets daily. The placement of station platforms on these streets would also require additional street or sidewalk width. Both of these streets serve as primary access points to I-394, and are heavily used by existing downtown bus traffic. Both 11th and 12th Streets are strategically important to the MARQ2 project as a means of access to and from the I-394 corridor. The removal of a traffic lane and additional space required for station platforms would constrain the vehicle throughput capacity of each street, thereby diminishing the ability of bus transit to efficiently operate on these streets. According to *Access Minneapolis*, "Most peak period express bus service enters and exits downtown via the freeway system. These points of access to and from downtown are often congested and can have a significant negative impact on the reliability and speed of transit service. Therefore, it is very important that the High Occupancy Vehicle (HOV) lanes that provide 'head of the queue' access around freeway ramp meters be maintained and that appropriate transit access is provided into downtown."¹⁰ Therefore, further constraining the capacity of already congested roads would likely compromise the operational efficiencies of the MARQ2 project.

Travel Time Comparison, Span of Service, and Frequency of Service

As the Twin Cities LRT system expands, adjustments will need to be made to the bus system to improve access between the rail and bus systems, and to take advantage of key transfer points. These adjustments can help minimize or eliminate service duplication. Some routes will need to

¹⁰ City of Minneapolis, *Access Minneapolis: Downtown Action Plan*. Pg. 27

be re-routed to serve LRT stations in order to connect travelers with destinations beyond the immediate station area. According to the bus network operating plans developed as part of the Southwest Transitway AA, several routes would be modified to serve stations, such as the extension of Route 21 and Route 53 to connect with the West Lake Station. However, final operating plans for the LRT and modifications to the bus network will be determined as the project progresses into preliminary engineering, and final design. Other service changes and enhancements can include the addition of new routes to act as a feeder service, depending on whether demand is warranted, funding is available, and is identified as part of the service modification process. Scheduling interface between the LRT and buses, such as what happens currently along the Hiawatha LRT line, will be determined at a later point in the project.

The following tables provide an overview of selected routes providing service to the Study Area. Table 2 displays the travel times and distances for the existing bus routes as compared to the LRT 3A and LRT 3C-1 (Nicollet Mall) alternatives from the proposed Southwest LRT stations. Travel times for the bus routes were determined using the public schedules on Metro Transit's website. Metro Transit updates the schedules on a quarterly basis, though not for every route, and it is therefore possible the travel times displayed may change. Travel times for the LRT were determined through the ridership forecast model and conceptual engineering plans. The data contained in the table are current as of June 30, 2009. Where a Southwest LRT station is between time points on Metro Transit's schedule, the average arrival times of the buses were used to determine the bus travel times.

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Station	Location	Terminus Point	Bus			LRT					Travel Time Improvements		
			Time (min)***	Route	Distance*	Time via 1A/3A (min)^	Time via 3C-1 (min)^	Time via 3C-2 (min)^	Route	Distance*	Travel Time Improvement 1A/3A	Travel Time Improvement 3C-1	Travel Time Improvement 3C-2
Franklin	Franklin Ave & Nicollet Ave	Nicollet Mall & 4th Street (assume 1 min before 3rd & Nicollet Point)	13	17	1.3	N/A	5.4	5.9	3C-1/3C-2	1.3	N/A	51%	46%
Franklin	Franklin Ave & Nicollet Ave	Nicollet Mall & 4th Street (assume 1 min before 3rd & Nicollet Point)	13	18	1.3	N/A	5.4	5.9					
28th St.	28th St. & Nicollet Ave (assume 2min after 1st & Lake Point)	Nicollet Mall & 4th Street (assume 1 min before 3rd & Nicollet Point)	15	18	2	N/A	8.1	8.6	3C-1/3C-2	2	N/A	46%	43%
Uptown	Uptown Transit Station	Hennepin Avenue & 4th Street (assume 3 min after 7th & Hennepin Point)	17	6	2.6	N/A	11.3	11.8	3C-1/3C-2	3.1	N/A	34%	31%
Uptown	Uptown Transit Station	Hennepin Avenue & 4th Street (assume 3 min after 7th & Hennepin Point)	17	12	2.6	N/A	11.3	11.8	3C-1/3C-2	3.1	N/A	34%	31%
Uptown	Uptown Transit Station	Nicollet Mall & 4th Street (assume 1 min before 3rd & Nicollet Point)	21	17	2.6	N/A	11.3	11.8	3C-1/3C-2	3.1	N/A	46%	44%

Station	Location	Terminus Point	Bus			LRT					Travel Time Improvements		
			Time (min)***	Route	Distance*	Time via 1A/3A (min)^	Time via 3C-1 (min)^	Time via 3C-2 (min)^	Route	Distance*	Travel Time Improvement 1A/3A	Travel Time Improvement 3C-1	Travel Time Improvement 3C-2
Lyndale	29th St. & Lyndale Ave (assume Lyn-Lake)	Hennepin Avenue & 4th Street (assume 3 min after 7th & Hennepin Point)	17	4	2.6	N/A	9.6	10.1	3C-1/3C-2	2.6	N/A	44%	41%
Penn	Penn Avenue & Glenwood Avenue	Nicollet Mall & 8th Street	11	9	1.9	4.6	N/A	N/A	1A/3A	1.3	58%	N/A	N/A
21st St.	21st St. & Sheridan Avenue (assume 2 min after 24th & Sheridan Point)	Nicollet Mall & 4th Street	21	25	3.1	5.9	N/A	N/A	1A/3A	2.8	72%	N/A	N/A
West Lake	Excelsior Blvd & France Avenue	Nicollet Mall & 4th Street (assume 1 min before 3rd & Nicollet Point)	27	17	4.9	7.9	13.5	14	All	3.9/4.4	71%	50%	48%
West Lake	Excelsior Blvd & France Avenue	Hennepin Avenue & 4th Street (assume 3 min after 7th & Hennepin Point)	23	12	4.5	7.9	13.5	14	All	3.9/4.4	66%	41%	39%
Beltline	Ottawa Avenue & Minnetonka Blvd	Nicollet Mall & 4th Street (assume 1 min before 3rd & Nicollet Point)	36	17	5.2	9.3	15.1	15.6	All	4.7/5.3	74%	58%	57%

Station	Location	Terminus Point	Bus			LRT					Travel Time Improvements		
			Time (min)***	Route	Distance*	Time via 1A/3A (min)^	Time via 3C-1 (min)^	Time via 3C-2 (min)^	Route	Distance*	Travel Time Improvement 1A/3A	Travel Time Improvement 3C-1	Travel Time Improvement 3C-2
Wooddale	Walker & Lake (Wooddale)	Nicollet Mall & 4th Street (assume 1 min before 3rd & Nicollet Point)	28	668	6.6	11.2	16.8	17.3	All	5.6/6.1	60%	40%	38%
Louisiana	Minnetonka Blvd & Louisiana Avenue	Nicollet Mall & 4th Street (assume 1 min before 3rd & Nicollet Point)	34	17	6.7	12.6	18.2	18.7	All	6.2/6.8	63%	46%	45%
Blake	Blake Road & Cambridge St.	Nicollet Mall & 4th Street (assume 1 min before 3rd & Nicollet Point)	46	17	8.7	14.7	20.3	20.8	All	7.2/7.8	68%	56%	55%
Blake	Blake Road & Cambridge St.	Nicollet Mall & 4th Street (assume 1 min before 3rd & Nicollet Point)	36	668	8.3	14.7	20.3	20.8	All	7.2/7.8	59%	44%	42%
Hopkins	Main Street & 11th Avenue	Hennepin Avenue & 4th Street (assume 3 min after 7th & Hennepin Point)	40	12	9.2	16.7	22.3	22.8	All	8.5/9.1	58%	44%	43%
Shady Oak	K-Tel & Shady Oak Road**	Hennepin Avenue & 4th Street (assume 3 min before 7th & Hennepin Point)	56	12	10.6	18.6	24.2	24.7	All	9.3/9.9	67%	57%	56%

Station	Location	Terminus Point	Bus			LRT					Travel Time Improvements		
			Time (min)***	Route	Distance*	Time via 1A/3A (min)^	Time via 3C-1 (min)^	Time via 3C-2 (min)^	Route	Distance*	Travel Time Improvement 1A/3A	Travel Time Improvement 3C-1	Travel Time Improvement 3C-2
Highway 62	Townline Road & County Road 62	Hennepin Avenue & Washington Avenue	56	664	19.5	23.2	N/A	N/A	1A	11.8	59%	N/A	N/A
Highway 5	Valley View Road & Eden Prairie Road	Gateway Transit Center	56	685	17.1	26	N/A	N/A	1A	13.8	54%	N/A	N/A
Opus	Shady Oak Road & Bren Road**	Hennepin Avenue & 4th Street (assume 3 min before 7th & Hennepin Point)	69	12	14.3	21.1	26.7	27.2	3A/3C-1/3C-2	10.5/11.1	69%	61%	61%
Opus	Smetana Drive & Smetana Road	Nicollet Mall & 4th Street (assume 1 min before 3rd & Nicollet Point)	32	665	13.2	21.1	26.7	27.2	3A/3C-1/3C-2	10.5/11.2	34%	17%	15%
Opus	Opportunity Partners**	Nicollet Mall & 4th Street (assume 1 min before 3rd & Nicollet Point)	63	568	12.6	21.1	26.7	27.2	3A/3C-1/3C-2	10.5/11.3	67%	58%	57%
City West	Yellow Circle Drive**	Hennepin Avenue & 4th Street (assume 3 min before 7th & Hennepin Point)	73	12	15.3	22.5	28.1	28.6	3A/3C-1/3C-2	11.0/11.6	69%	62%	61%
Golden Triangle	Shady Oak Road & Hwy 62 (P&R)	Gateway Ramp	34	684	N/A	22.4	30	30.5	3A/3C-1/3C-2	12.2/12.8	34%	12%	10%
Golden Triangle	Shady Oak Road & Hwy 62 (P&R)	Gateway Ramp	25	685	N/A	22.4	34.8	30.5	3A/3C-1/3C-2	12.2/12.8	10%	-39%	-22%

Station	Location	Terminus Point	Bus			LRT					Travel Time Improvements		
			Time (min) ^{***}	Route	Distance*	Time via 1A/3A (min) [^]	Time via 3C-1 (min) [^]	Time via 3C-2 (min) [^]	Route	Distance*	Travel Time Improvement 1A/3A	Travel Time Improvement 3C-1	Travel Time Improvement 3C-2
Southwest	Southwest Station	Gateway Ramp	60	684	N/A	29.2	34.8	35.3	3A/3C-1/3C-2	12.2/12.8	51%	42%	41%
Southwest	Southwest Station	6th & Marquette	26	690	N/A	29.2	34.8	35.3	3A/3C-1/3C-2	12.2/12.9	-12%	-34%	-36%
Southwest	Southwest Station	Gateway Ramp	29	691	N/A	29.2	34.8	35.3	3A/3C-1/3C-2	12.2/12.10	-1%	-20%	-22%
Southwest	Southwest Station	6th & Marquette	21	698	N/A	29.2	34.8	35.3	3A/3C-1/3C-2	12.2/12.11	-39%	-66%	-68%

Source: Hennepin County, 2009

* All distances are approximate. Distance for the bus routes are measure along each route independently, and not necessarily the shortest route. LRT distances are based on conceptual engineering design; final distances will be determined during Preliminary Engineering and Final Design.

** Reverse Commute Peak Service

*** Bus travel times are measured during am peak inbound to downtown Minneapolis

^ LRT travel times are approximate and will be refined in Preliminary Engineering and Final Design

Note: Bus service was only considered if service was provided from a proposed LRT station to downtown Minneapolis. Circulator routes with other destinations are not included.

Table 3 displays a comparison of the span of service for LRT as compared to the current bus network. Span of service refers to the revenue service hours available on a given day and defines the minimum period of time that service will operate at any point in the system. The span of service is generally determined by the existing ridership and productivity levels, the span of connecting transit routes, the availability of vehicles, hours of operation for major job centers, and customer requests. The following table provides information on the span of service for both the existing bus network and the proposed span of service for the LRT, derived from the Southwest LRT Alternatives Analysis study.

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Station	Location	Bus		LRT	
		Route	Hours of Service	Route	Hours of Service***
Franklin	Franklin Ave & Nicollet Ave	17	5am-2am	3C-1/3C-2	4am-2:30am
28th St.	28th St. & Nicollet Ave (assume 2min after 1st & Lake Point)	18	4:30am-2:30am	3C-1/3C-2	4am-2:30am
Uptown	Uptown Transit Station	6	4:30am-2:30am	3C-1/3C-2	4am-2:30am
Uptown	Uptown Transit Station	12	5:00am-12:00am	3C-1/3C-2	4am-2:30am
Uptown	Uptown Transit Station	17	5am-2am	3C-1/3C-2	4am-2:30am
Lyndale	29th St. & Lyndale Ave (assume Lyn-Lake)	4	4:30am-1:45am	3C-1/3C-2	4am-2:30am
Penn	Penn Avenue & Glenwood Avenue	9	5:30am-12:00am	1A/3A	4am-2:30am
21st St.	21st St. & Sheridan Avenue (assume 2 min after 24th & Sheridan Point)	25	6:00-8:30am, 3:30-7:00pm	1A/3A	4am-2:30am
West Lake	Excelsior Blvd & France Avenue	17	5am-2am	All	4am-2:30am
West Lake	Excelsior Blvd & France Avenue	12	5:30-8:30am, 2:30-6:30pm	All	4am-2:30am
Beltline	Ottawa Avenue & Minnetonka Blvd	17	5am-2am	All	4am-2:30am
Wooddale	Walker & Lake (Wooddale)	668	6:30-8:30am, 5:00-6:30pm	All	4am-2:30am
Louisiana	Minnetonka Blvd & Louisiana Avenue	17	5:00am-2:00am	All	4am-2:30am
Blake	Blake Road & Cambridge St.	17	5:15-6:30am, 12:00pm-2am	All	4am-2:30am
Blake Road	Blake Road & Cambridge St.	668	6:45-8:30am, 5:30-6:50pm	All	4am-2:30am
Hopkins	Main Street & 11th Avenue	12	5:15-8:15am, 2:15-5:40pm	All	4am-2:30am
Shady Oak	K-Tel & Shady Oak Road**	12	5:40-7:30am, 3:15-5:45pm	All	4am-2:30am
Highway 62	Townline Road & County Road 62	664	5:48-8:14am, 3:36-6:34pm	1A	4am-2:30am
Highway 5	Valley View Road & Eden Prairie Road	685	5:47-8:09am, 3:40-8:05pm	1A	4am-2:30am
Opus	Shady Oak Road & Bren Road**	12	5:50-9:00am, 4:15-6:10pm	3A/3C-1/3C-2	4am-2:30am
Opus	Smetana Drive & Smetana Road	665	6:15-7:15am, 4-5pm	3A/3C-1/3C-2	4am-2:30am
Opus	Opportunity Partners**	568	7:45am, 3:45pm	3A/3C-1/3C-2	4am-2:30am
City West	Yellow Circle Drive**	12	5am-1am	3A/3C-1/3C-2	4am-2:30am
Golden	Shady Oak Road & Hwy 62 (P&R)	684	5:15-8am, 3-6pm	3A/3C-1/3C-	4am-2:30am

Triangle				2	
Golden Triangle	Shady Oak Road & Hwy 62 (P&R)	685	6:20-7:40am	3A/3C-1/3C-2	4am-2:30am
Southwest	Southwest Station	684	5:30-8:30am, 2:30-5:30pm	3A/3C-1/3C-2	4am-2:30am
Southwest	Southwest Station	690	7:45-10am, 4:15-5:30pm	3A/3C-1/3C-2	4am-2:30am
Southwest	Southwest Station	691	5:45am	3A/3C-1/3C-2	4am-2:30am
Southwest	Southwest Station	698	8:50am-5:45pm	3A/3C-1/3C-2	4am-2:30am

Source: Hennepin County, 2009

* All distances are approximate. Distance for the bus routes are measure along each route independently, and not necessarily the shortest route. LRT distances are based on conceptual engineering design; final distances will be determined during Preliminary Engineering and Final Design.

** Reverse Commute Peak Service

*** Hours of Service for LRT derived from AA operating plan

Note: Bus service was only considered if service was provided from a proposed LRT station to downtown Minneapolis. Circulator routes with other destinations are not included.

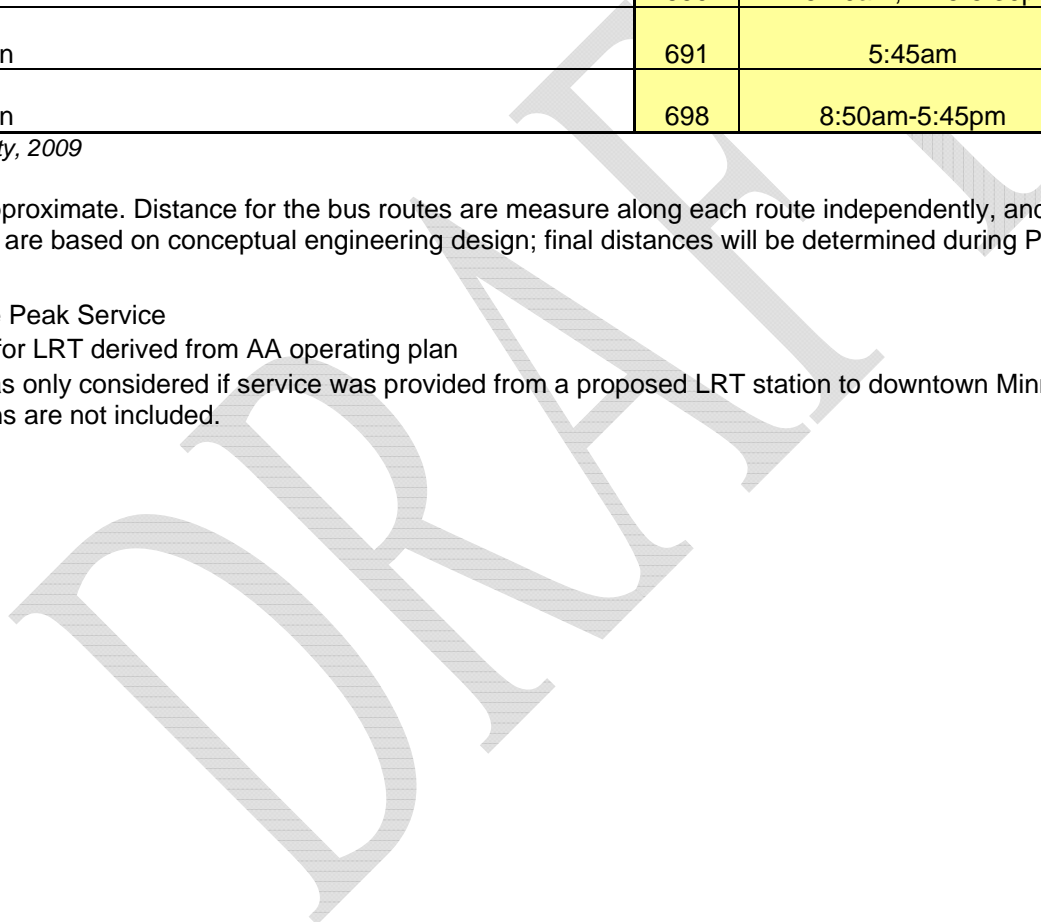


Table 4 displays a comparison of the frequency of service for LRT as compared to the current bus network. Frequency of service refers to the time interval between consecutive transit trips, sometimes referred to as the headway. The following table provides information on peak and off-peak period service frequencies for existing bus network and the LRT alternatives.

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Station	Location	Bus				LRT			
		Route	Peak Frequency	Off Peak Frequency	Distance*	Route	Peak Frequency***	Off Peak Frequency***	Distance*
Franklin	Franklin Ave & Nicollet Ave	17	5-15 minutes	10-15 minutes	1.3	3C	7-8 minutes	10-15 minutes	1.3
28th St.	28th St. & Nicollet Ave	18	5-8 minutes	7-8 minutes	2	3C	7-8 minutes	10-15 minutes	2
Uptown	Uptown Transit Station	6	5-7 minutes	10 minutes	2.6	3C	7-8 minutes	10-15 minutes	3.1
Uptown	Uptown Transit Station	12	15-20 minutes	30 minutes	2.6	3C	7-8 minutes	10-15 minutes	3.1
Uptown	Uptown Transit Station	17	5-15 minutes	10-15 minutes	2.6	3C	7-8 minutes	10-15 minutes	3.1
Lyndale	29th St. & Lyndale Ave	4	7-15 minutes	15 minutes	2.6	3C	7-8 minutes	10-15 minutes	2.6
Penn	Penn Avenue & Glenwood Avenue	9	30 minutes	60 minutes	1.9	1A/3A	7-8 minutes	10-15 minutes	1.3
21st St.	21st St. & Sheridan Avenue	25	20-30 minutes	No service downtown	3.1	1A/3A	7-8 minutes	10-15 minutes	2.8
West Lake	Excelsior Blvd & Market Plaza	17	5-15 minutes	10-15 minutes	4.9	1A/3A/3C	7-8 minutes	10-15 minutes	3.9/4.4
West Lake	Excelsior Blvd & Market Plaza	12	15-20 minutes	No service downtown	4.5	1A/3A/3C	7-8 minutes	10-15 minutes	3.9/4.4
Beltline	Beltline Blvd & TH 7	17	2 trips in am	No Service	5.2	1A/3A/3C	7-8 minutes	10-15 minutes	4.7/5.3
Wooddale	Walker & Lake (Wooddale)	668	15-30 minutes	No Service	6.6	1A/3A/3C	7-8 minutes	10-15 minutes	5.6/6.1
Louisiana	Minnetonka Blvd & Louisiana Avenue	17	15-20 minutes	30 minutes	6.7	1A/3A/3C	7-8 minutes	10-15 minutes	6.2/6.8
Blake	Blake Road & Cambridge St.	17	30 minutes	30 minutes	8.7	1A/3A/3C	7-8 minutes	10-15 minutes	7.2/7.8
Blake	Blake Road & Cambridge St.	668	15-30 minutes	No Service	8.3	1A/3A/3C	7-8 minutes	10-15 minutes	7.2/7.8
Hopkins	Main Street & 11th Avenue	12	15-20 minutes	30 minutes	9.2	1A/3A/3C	7-8 minutes	10-15 minutes	8.5/9.1
Shady Oak	K-Tel & Shady Oak Road**	12	60 minutes	No Service	10.6	1A/3A/3C	7-8 minutes	10-15 minutes	9.3/9.9
Highway 62	Townline Road & County Road 62	664	4 trips am, 5 trips pm	No Service	19.5	1A	7-8 minutes	10-15 minutes	11.8
Highway 5	Valley View Road & Eden Prairie Road	685	15-40 minutes (am & pm)	No Service	17.1	1A	7-8 minutes	10-15 minutes	13.8
Opus	Shady Oak Road & Bren Road**	12	30-60 minutes	No Service	14.3	3A/C	7-8 minutes	10-15 minutes	10.5/11.1
Opus	Smetana Drive & Smetana Road	665	3 trips	No Service	13.2	3A/C	7-8 minutes	10-15 minutes	10.5/11.2
Opus	Opportunity Partners	568	1 trip	No Service	12.6	3A/C	7-8 minutes	10-15 minutes	10.5/11.3
City West	Yellow Circle Drive**	12	30 minutes	No Service	15.3	3A/C	7-8 minutes	10-15 minutes	11.0/11.6
Golden Triangle	Shady Oak Road & Hwy 62 (P&R)	684	4 trips	No Service	N/A	3A/C	7-8 minutes	10-15 minutes	12.2/12.8
Golden Triangle	Shady Oak Road & Hwy 62 (P&R)	685	4 trips	No Service	N/A	3A/C	7-8 minutes	10-15 minutes	12.2/12.8

Southwest	Southwest Station	684	4 trips	No Service	N/A	3A/C	7-8 minutes	10-15 minutes	12.2/12.8
Southwest	Southwest Station	690	6 trips am, 3 trips pm	No Service	N/A	3A/C	7-8 minutes	10-15 minutes	12.2/12.9
Southwest	Southwest Station	691	1 trip	No Service	N/A	3A/C	7-8 minutes	10-15 minutes	12.2/12.10
Southwest	Southwest Station	698	15-45 minutes	1-2 hours	N/A	3A/C	7-8 minutes	10-15 minutes	12.2/12.11

Source: Hennepin County, 2009

* All distances are approximate. Distance for the bus routes are measure along each route independently, and not necessarily the shortest route. LRT distances are based on conceptual engineering design; final distances will be determined during Preliminary Engineering and Final Design.

** Reverse Commute Peak Service

*** Peak and Off-Peak LRT frequencies are derived from AA operating plans

Note: Bus service was only considered if service was provided from a proposed LRT station to downtown Minneapolis. Circulator routes with other destinations are not included.

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2.2.6 Transit Service Inventory

Table 5 below is an inventory of the current bus routes providing service to bus stops, park and ride facilities, and transit centers within one-quarter mile of the proposed LRT alternative alignments. The table provides basic service characteristics for Metro Transit and SouthWest Transit buses based on the bus scheduling and service information available on both agency websites. As noted above, downtown Minneapolis is considered to be a saturated transit market, with transit services operating on most downtown streets including several transit center terminals. Because of the comprehensive nature of downtown service, all the bus routes serving downtown Minneapolis have not been included in this analysis.

As noted, 25 bus routes provide a mixture of express and local bus service within the Southwest LRT Study Area. Express routes principally provide service during the peak periods, with minimal off-peak midday service. Local routes provide regular service, although as distance from the Minneapolis Central Business District (CBD) increases, the frequency of service for local routes tends to drop, resulting in increased headways between buses and route variations, such as the Route 12K, providing service along much of the Route 12 fixed route alignment, but deviating to serve specific areas at specific times of day. Generally, weekend service is limited to select routes with service primarily in and around Minneapolis.

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Table 5 Transit Service Inventory

Route	Service Frequency Headways (minutes)							
	Service Type	Peak ^a	Off-Peak	Evening	Owl ^b	Total Weekday Trips ^c	Saturday	Sunday
MT 2	Local	15	15-30	20-30	N/A	143	20	20-30
MT 6	Local, High-Frequency	5-7	10	15	N/A	222	10-15	15
MT 4	Local	7-15	15	15-30	N/A	151	15-30	30
MT 9	Local	15	30	30	N/A	94	30-60	30-60
MT 12	Local	15-20	30	30	N/A	95	30	30
MT 17	Local	5-15	10-15	30	N/A	156	15-30	30
MT 18	Local, High-Frequency	5-8	7-8	7-15	60-180	280	7-10	10-15
MT 21	Local, High-Frequency	7-10	7-15	7-15	1/hr	234	7-15	10-20
MT 23	Local	20	20-30	30	N/A	91	30	30
MT 25	Local	7-10	60	N/A	N/A	66	80	N/A
MT 53	Express Local	10-20	12	N/A	N/A	56	N/A	N/A
MT 114	Express Local	15-60	120+	N/A	N/A	28	N/A	N/A
MT 568 ^d	Express	N/A	N/A	N/A	N/A	2	N/A	N/A
MT 604	Circulator	60	60	N/A	N/A	20	N/A	N/A
MT 615	Circulator	60	60	N/A	N/A	21	120	N/A
MT 664	Express	N/A	N/A	N/A	N/A	3-5	N/A	N/A
MT 665	Express	N/A	N/A	N/A	N/A	3	N/A	N/A
MT 668	Express	N/A	N/A	N/A	N/A	4	N/A	N/A
SWT 603 ^e	Circulator	30-45	30-60	N/A	N/A	18	N/A	N/A

Route	Service Frequency Headways (minutes)							
	Service Type	Peak ^a	Off-Peak	Evening	Owl ^b	Total Weekday Trips ^c	Saturday	Sunday
SWT 680	Express	25-35	N/A	N/A	N/A	5	N/A	N/A
SWT 684 ^f	Reverse Commute, Express	45	75	N/A	N/A	15	N/A	N/A
SWT 685	Express	25-30	N/A	N/A	N/A	9	N/A	N/A
SWT 690	Express	5-10	120	N/A	N/A	43	N/A	N/A
SWT 691	Express	N/A	N/A	N/A	N/A	1	N/A	N/A
SWT 693 ^g	Local, Saturdays Only	N/A	N/A	N/A	N/A	N/A	60	N/A
SWT 694	Express	N/A	N/A	60	N/A	9	N/A	N/A
SWT 695	Express	60	N/A	N/A	N/A	8	N/A	N/A
SWT 698	Express	60	N/A	N/A	N/A	18	N/A	N/A

^a Weekday Rush Hour or "Peak" Hours: Weekdays 6-9 am and 3-6:30 pm

^b Owl service is provided from 1am to 5am

^c Metro Transit Route 568 is a fixed-route twice daily limited stop shuttle service from downtown Minneapolis to Opportunity Partners in Minnetonka.

^d Routes 603 and 693 are circulating loop services. Route 603 operates during the weekdays only in Eden Prairie, and Route 693 provides Saturday only service between Eden Prairie and Southdale Mall in Edina.

^e Total weekday trips refers to the total number of round trips made during a 24 hour period.

^f Route 684 is a reverse commute express route.

^g Route 693 operates only during the weekends.

2.4 Access for People, Housing and Jobs

According to the Metropolitan Council's 1999 State of the Region Report, the seven county metropolitan area of Minneapolis had a population in 1997 of 2,515,119 and ranked as the 16th most populated metropolitan area in the nation. By 2000, the metropolitan area population had risen to 2,642,062, representing a five percent increase within three years. In January 2004, the Metropolitan Council published the *2030 Regional Development Framework*, which forecasted a metropolitan area population to 3,608,000 by 2030, nearly a 37 percent increase from 2000. The Twin Cities region is expected to add approximately 1 million people to its 2.7 million population base by 2030.

Population, household, and employment growth is heaviest in and around the City of Minneapolis, with growth rates tapering as distance increases from the downtown core. When each socioeconomic characteristic is considered independently of one another, pockets of growth can be seen along each of the LRT alternatives. Robust population and household growth is anticipated to occur throughout the corridor, primarily concentrated around the City of Minneapolis, with increases also seen in St. Louis Park, Edina, and Hopkins. Healthy growth in population and households is anticipated in Minnetonka and Eden Prairie, however at more modest rates. While downtown Minneapolis will continue to act as the major regional employment center, job growth is also anticipated to be heavy in the Opus office park surrounding the proposed Opus and City West station locations in Minnetonka, the Golden Triangle region, and near the Eden Prairie Town Center in Eden Prairie. Pockets of job growth are also forecast near downtown Hopkins, St. Louis Park, and Edina along Excelsior Boulevard.

2.2.7 Criteria

For this evaluation, a one-half mile radial buffer was established around the proposed stations for each LRT alignment to determine accessibility by calculating the population, households and employment in the vicinity. Refer to the tables below for the segments that comprise each LRT alternative and the stations included on each segment. Refer to Figure 6 for a map of the LRT Segments.

Table 6 LRT Alignments by Segment

LRT Alternatives	Segments
LRT 1A	Segment 1, Segment 4, Segment A
LRT 3A	Segment 3, Segment 4, Segment A
LRT 3C-1 (Nicollet Mall)	Segment 3, Segment 4, Segment C-1 (Nicollet Mall)
LRT 3C-2 (11 th /12 th Street)	Segment 3, Segment 4, Segment C-2 (11 th /12 th Streets via Nicollet Avenue Tunnel)
	Segment 3, Segment 4, Segment C-2A [^] (11 th /12 th Streets via Blaisdell Ave Tunnel Option)
	Segment 3, Segment 4, Segment C-2B [^] (11 th /12 th Streets 1 st Ave Tunnel Option)

[^]Segment C-2 includes two alternate route options for tunneling between the Midtown Corridor and 12th Street instead of under Nicollet Avenue. Option C-2A would tunnel under Blaisdell Avenue and Option C-2B would tunnel under 1st Avenue. Because these are located within one block east and west of Segment C-2 they have not been separated for the purpose of this evaluation.

Table 7 LRT Alignment Segment Stations

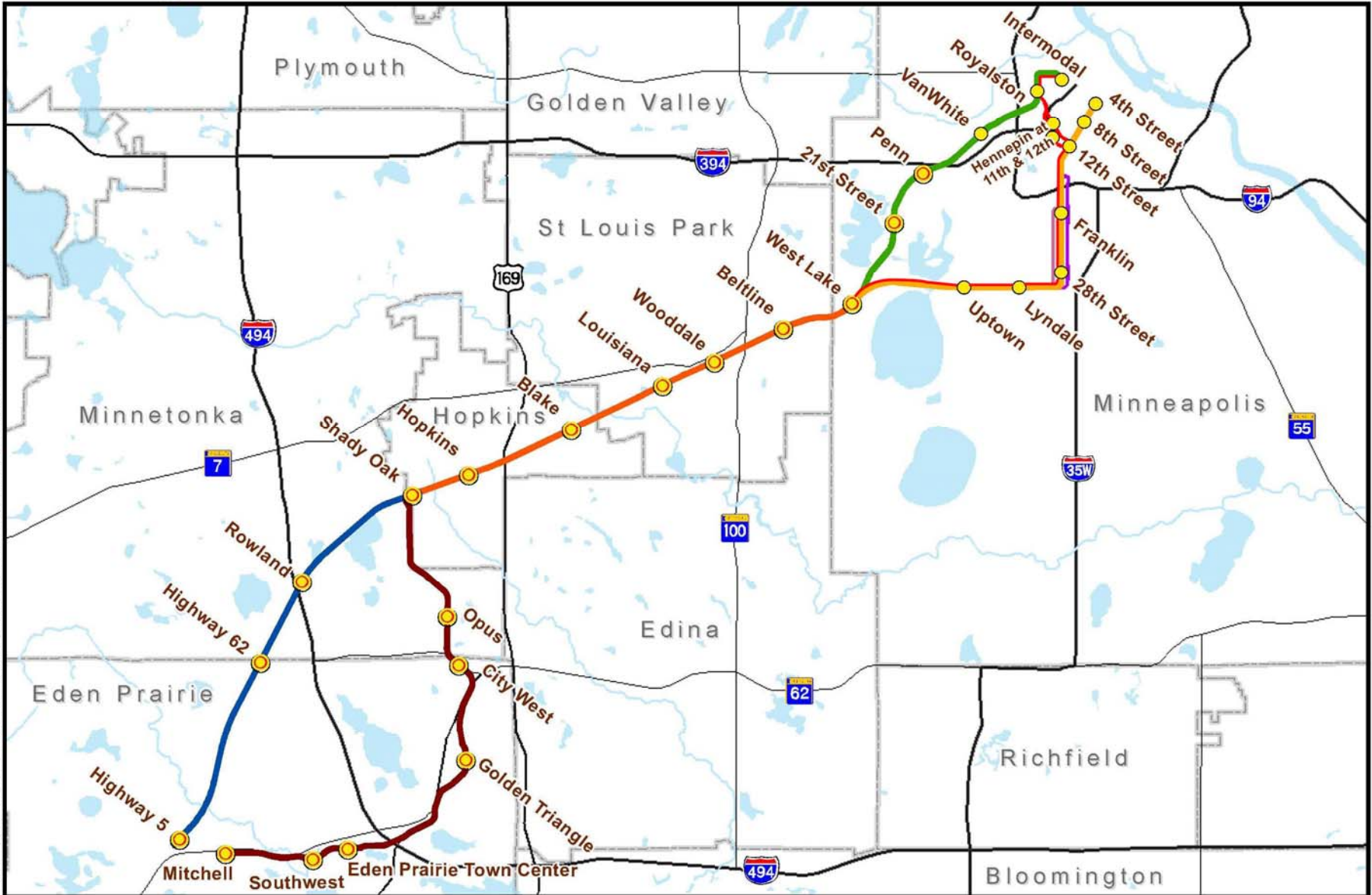
Segment	Stations on Segment
Segment 1	Highway 5, Highway 62 and Rowland Rd.
Segment 3	Mitchell, Southwest Station, Eden Prairie Town Center, Golden Triangle, City West and Opus
Segment 4	Shady Oak, Hopkins, Blake, Louisiana, Wooddale, Bellline and West Lake
Segment A	21st Street, Penn, Van White, Royalston, Intermodal, 5th Street and Nicollet Mall (4th Street)
Segment C-1 (Nicollet Mall)	Uptown, Lyndale, 28th Street, Franklin, 12th Street, 8th Street and 4th Street
Segment C-2 (11th/12th Street)	Uptown, Lyndale, 28th Street, Franklin, 12th Street (Nicollet Mall), 11 th at Hennepin Ave, 12 th at Hennepin Ave, Royalston, Intermodal, 5th Street and Nicollet Mall (4th Street)

2.2.8 Measurement

In order to determine the population, number of households, and number of jobs served by the LRT alternatives, the stations along each alternative segment were overlaid onto Transportation Analysis Zone (TAZ) data provided by the project partner cities. A TAZ is a geographic area demarcated by transportation professionals for determining traffic-related data, including journey-to-work and place-of-work statistics. These zones vary in size but typically include one or more Census tracts, Census block groups, or Census blocks. The TAZ data used for this analysis were the data provided by the project partner cities to the Metropolitan Council as part of the latest comprehensive plan updates. Under State of Minnesota law, cities are required to update their comprehensive plans every 10 years with the Council under the Metropolitan Land Planning Act. As the regional metropolitan planning organization (MPO), the Metropolitan Council is responsible for approving these plans and the TAZ allocations made by each city. It should be noted that at the time of this analysis, the data provided by the cities had not been approved by the Metropolitan Council. Agreement was reached between the project partner cities and the Council that the TAZ numbers provided by the cities could be used on an interim basis for this analysis. However, it is important to note that for the Federal Transit Administration (FTA) and the FTA New Starts Program, the TAZ data used in submittals for federal funding and ridership modeling must be approved by the Metropolitan Council. The TAZ data is graphically represented by various sized polygons. A one-half mile buffer was created around LRT station, establishing a total diameter of one mile. Where stations were located less than one mile apart and their buffers intersected, the areas were combined. Where ever the buffered area intersected with a TAZ or a portion of a TAZ data from that zone it was associated with that alignment. Duplication was avoided by evaluating each segment with its respective stations independently for example if TAZ intersected the buffers around two stations that were in close proximity was only included once for that segment. Years 2000, 2010, and 2030 forecast data fields were used to determine changes to population, households, and employment in proximity to the proposed stations. In order to directly compare Segment A with Segment C-1 and Segment C-2 in downtown Minneapolis a common endpoint was designated at 4th Street and Nicollet Mall assuming interlining with either the Hiawatha or Central Corridor LRTs so that stations at 5th Street and Warehouse were included in the evaluation of those segments. The tables below provide the results of each evaluation and the percent change between the year 2000 and the projected years.

LRT Segments

Figure 6



Map Document: (\\mspe-gis-file\GISPro\HennCity\87130\map_docs\mxd\TECH_MEMO\TechMemo2\Fig3_TM2_Segments_20090817.mxd) 8/17/2009 cseers

<p>LPA Report</p>	Legend	
	<ul style="list-style-type: none"> ● Station ● Park & Ride Station 	<ul style="list-style-type: none"> — Segment 1 — Segment 3 — Segment 4 — Segment A

2.2.9 Evaluation

Downtown Minneapolis has witnessed a surge in residential development in recent years. The Southwest LRT Study Area has also experienced substantial residential and employment growth. Refer to Figure 7 for a map of the project Study Area and LRT alignments.

Between the years 2000 and 2010 Segments 3, 4, C-1 and C-2 are projected to see small population increases while Segment 1 is projected to decline in population slightly. Segment A stands out from the other segments in this timeframe with a project population growth of 26 percent increase projected from 2000 to 2010.

Projected population illustrates growth for all segment station areas between the year 2000 and 2030. Again, Segment A stands out with an increase of 132 percent. However, Segment 3 experiences the greatest projected population increase at a significant 196 percent. Segment 1 will experience the lowest population increase during the same period.

Overall, Segment C-1 (Nicollet Mall) and Segment C-2 (11th/12th Street) have the largest total populations of the planning segments, which include the densely populated urban neighborhoods of southwest Minneapolis, but their projected growth is only six and nine percent projected to 2010. Population projections show an increase for the C Segments to 2030 where a 46 and 57 percent increase is projected. When compared to the growth anticipated along the stations for Segment A (132 percent), which is also located in Minneapolis, the C segments population growth is significantly lower but total population is still greater. Segment 1 and Segment 3, which are located in the western suburban areas of Minnetonka and Eden Prairie, have the smallest populations accessible to their respective stations but Segment 3 will experience more projected growth than any other segment in the Study Area.

Refer to Table 8 for population within ½ mile of the stations on each segment.

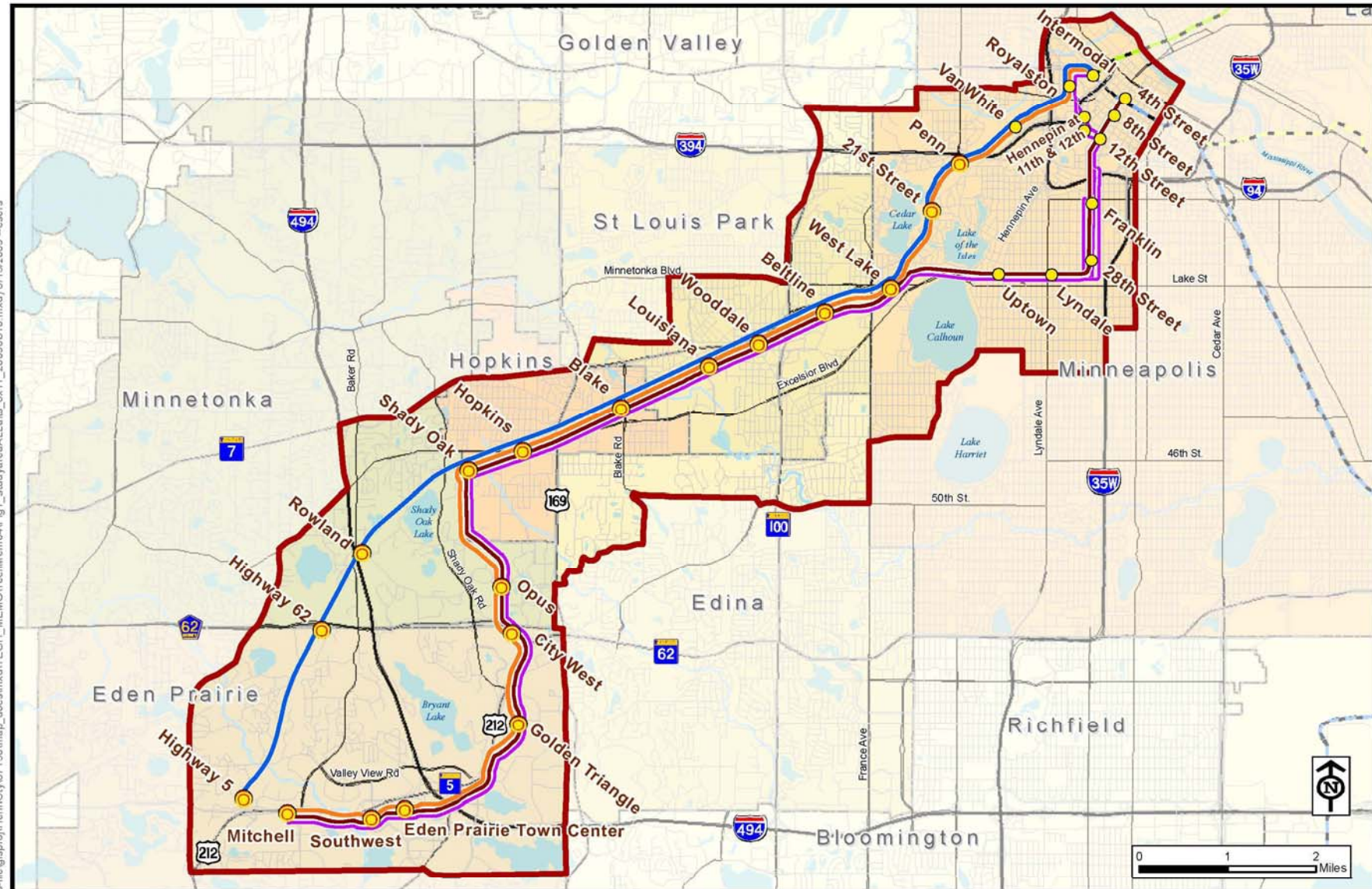
Table 8 Population by Segment Stations

LRT Study Area Segment Stations	Year 2000	Projected 2010	Percent change from 2000	Projected 2030	Percent change from 2000
Segment 1 Stations	9,294	9,143	-2%	9,792	5%
Segment 3 Stations	7,546	7,636	1%	22,329	196%
Segment 4 Stations	35,631	37,799	6%	43,686	23%
Segment A Stations	16,173	20,333	26%	37,494	132%
Segment C-1 Stations	62,276	66,053	6%	87,422	46%
Segment C-2 Stations	63,532	69,492	9%	99,684	57%


Source Data: City of Minneapolis, City of St. Louis Park, City of Hopkins, City of Minnetonka, City of Edina, City of Eden Prairie, 2009.

Figure 7

Southwest Transitway Study Area



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 <p>LPA Report</p>	Legend			
	<ul style="list-style-type: none"> Study Area Station Park & Ride Station 	<ul style="list-style-type: none"> LRT 1A LRT 3A LRT 3C-1 (Nicollet Mall) LRT 3C-2 (11th/12th Street) 	<ul style="list-style-type: none"> Hiawatha Light Rail Northstar Commuter Rail Central Corridor Light Rail 	<ul style="list-style-type: none"> Municipal Boundaries

While the number of households accessible to stations along every segment is anticipated to grow, the greatest increase is projected for Segment A and Segment 1. Segment C-1 and C-2 again represent the segments with the overall greatest number of households due to their proximity to densely populated urban Minneapolis neighborhoods. However, Segment A and Segment 3 stand out again with the greatest projected growth between the years 2000 and 2030.

While Segment 1 ultimately captures the fewest households it also represents the smallest does anticipated growth overall (14 percent) projected to 2030. Refer to Table 9 or household data within ½ mile of the stations on each segment.

Table 9 Households by Segment Stations

LRT Study Area Segment Stations	Year 2000	Projected 2010	Percent change from 2000	Projected 2030	Percent change from 2000
Segment 1 Stations	3,782	3,830	1%	4,318	14%
Segment 3 Stations	3,988	4,240	6%	12,149	205%
Segment 4 Stations	17,698	18,220	3%	21,117	19%
Segment A Stations	7,683	10,172	32%	19,569	155%
Segment C-1 Stations	34,030	37,520	10%	45,202	38%
Segment C-2 Stations	34,497	39,145	13%	52,222	51%

Source Data: City of Minneapolis, City of St. Louis Park, City of Hopkins, City of Minnetonka, City of Edina, City of Eden Prairie, 2009.

The project Study Area is home to many major employers. Segments A and C-1 and C-2 include downtown Minneapolis, the region's largest employment center with over 150,000 jobs. Segment 3 includes the Golden Triangle and the Opus business park which is the region's sixth largest employment center with over 70,000 jobs.

Between the years 2000 and 2010, healthy job growth (between 14 and 17 percent) is projected for areas accessible to stations on Segments 1, 3 and 4. During that same period employment opportunities around stations on Segments A, C-1 and C-2 are projected to decline.

In the long-range projections to 2030 growth is projected for every segment station area except Segment 1. Segments 3 and 4 stand out among the stations with the largest percent increases between 2000 and 2030. Because of their location Segments A, C-1 and C-2 represent areas with the largest number of jobs accessible to their respective stations.

Refer to Table 10 for employment within ½ mile of the stations on each segment.

Table 10 Employment by Segment Stations

LRT Study Area Segment Stations	Year 2000	Projected 2010	Percent change from 2000	Projected 2030	Percent change from 2000
Segment 1 Stations	14,790	17,278	17%	14,472	-2%
Segment 3 Stations	39,191	44,809	14%	51,849	32%
Segment 4 Stations	32,847	38,092	16%	51,098	56%
Segment A Stations	134,224	130,406	-3%	156,042	16%
Segment C-1 Stations	157,440	150,579	-4%	174,788	12%
Segment C-2 Stations	165,971	16,000	-4%	185,066	12%

Source Data: City of Minneapolis, City of St. Louis Park, City of Hopkins, City of Minnetonka, City of Edina, City of Eden Prairie, 2009.

Summary

A summary of the total populations, households and employment projected for the segments in 2030 is presented below by LRT alternative. Population projections to the year 2030 are rounded to the nearest thousandth in the table below.

Table 11 Accessibility Summary Results

Criteria	Alternative							
	LRT 1A		LRT 3A		LRT 3C-1 (Nicollet Mall)		LRT 3C-2 (11 th /12 th Street)	
Year	2010	2030	2010	2030	2010	2030	2010	2030
Population within ½ mile of stations	67,000	91,000	66,000	104,000	111,000	153,000	115,000	166,000
Households within ½ mile of stations	32,000	45,000	33,000	53,000	60,000	78,000	62,000	85,000
Employment within ½ mile of stations	186,000	222,000	213,000	259,000	233,000	278,000	99,000	288,000

Source Data: City of Minneapolis, City of St. Louis Park, City of Hopkins, City of Minnetonka, City of Edina, City of Eden Prairie, 2009.