# Light Rail Transit in the Twin Cities: The Central Corridor

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**Patrick J. Boylan**
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Comments and questions can be directed to me at:

2501 Lancaster Lane # 266
Plymouth, MN 55441
545-7639

or e-mail me at:

e-mail boyl0021@gold.tc.umn.edu

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Abstract

The Twin Cities metropolitan area is considering a light rail transit (LRT) system to supplement it's transportation system management. LRT will be one tool in which planners and government officials can use for urban redevelopment and renewal, as well as to reduce congestion, pollution and fossil fuel use. The lead agencies of the Minnesota Department of Transportation and the Metropolitan Council are jointly proceeding with the Ramsey County Regional Railroad Authority and the Hennepin County Regional Railroad Authority to plan and implement two initial corridors. The first priority will be the Central Corridor, which will serve both downtown Minneapolis and St. Paul, the State Capitol, and the University of Minnesota areas. The present status of LRT will be explored. Funding for LRT is a significant issue at the time of this writing.

A wide variety of vehicles are used to provide the transportation needs in the United States. In the cities which use a number of different transportation technologies, each plays a complementary role in providing transit service within a single regional transit system. Any utilized technology should be placed within a larger transportation planning context. Cities such as Portland, Oregon and Sacramento, California have demonstrated the positive effects in their transportation management systems and revitalized downtown areas as a result of constructing Light Rail Transit (RCRRA/SRF 1989b) & (BRW 1992a).

The introduction of Light Rail Transit (LRT) to the Twin Cities Metropolitan Area would result in modifications to the existing bus service to take advantage of the characteristics of both LRT and the bus system. LRT could help alleviate congestion on the region's freeways and major arterials and also serve as a land use tool to regenerate areas within walking distance of stations. This paper will discuss the current status of LRT in the Twin Cities.

## The Current Transit System in the Twin Cities

Commuters, shoppers, sightseers and tourists in the Twin Cities region are served exclusively by roads and highways built for cars and buses. The Twin Cities are served by two interstate highway systems and many supportive state, county and national highways. In the early 1950s, there were fewer than ten miles of freeways in the region. Now in the 1990s, there are over 500 miles of limited access high speed roads (Mohowald 1993).

Bus routes follow "spoke and hub" design with the downtown areas of Minneapolis and St. Paul being the hubs and the routes radiating outward. Routes follow the old streetcar routes of the early twentieth century, and have expanded into the newer suburban areas. Route service is considered very good in the central cities and first ring suburbs (Rafter 1993b). The MTC operates small, regular and articulated sized buses for route service.

Fare rates are $1.00 for basic service with $.25 additional for any of the following: peak hour use (Mon.-Fri. 6-9 am and 3:30-6:30 pm), express service and traveling through more than one zone.

The Regional Transit Board (RTB) directs funds and policies to providers of transit. In 1992, the Metropolitan Transit Commission (MTC) received 82.6% of all transit expenditures. The second largest transit provider is Metro Mobility, consuming 12% of funding. Metro Mobility services transit dependant persons who cannot utilize the regular transit buses of the MTC. The remaining funds go to community based systems, Transportation Demand Management programs and administrative expenses (FTA 1993c, Blin 1993b).

**Problems with the Current Transportation Landscape**

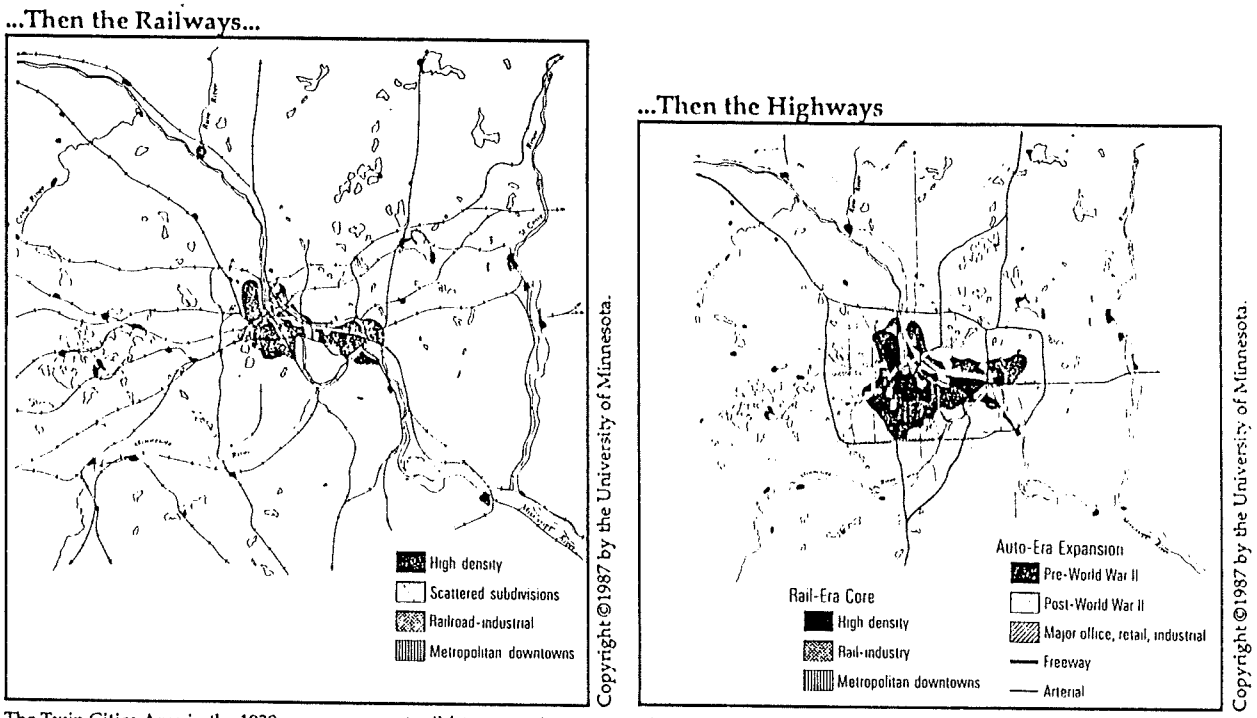
The Twin Cities metropolitan area is suffering from freeway congestion and air and noise pollution. The region is also characterized by urban sprawl and low residential densities. This sprawl is placing a strain on the transportation networks by acting to increase vehicle miles traveled thereby slowing commuters and commerce related movements. Consequently, this will adversely affect the commercial, economic and social fabric of the Minneapolis and St. Paul metropolitan area (see Appendix 3). The Metropolitan Council, which is the Twin Cities Metropolitan Planning Organization (MPO), is considering ways to reduce the demands upon the transportation corridors such as: exclusive corridors for buses, high occupancy vehicle (HOV) lanes and Light Rail Transit. Other previous solutions, such as building and expanding freeways are considered outdated strategies. The Metropolitan Council believes that additional lane capacity for highways without provisions for high-occupancy vehicles feeds into the very problem it tries to solve. The Twin Cities area is one of the largest metropolitan areas in the United States that has not implemented a commuter

rail system (Collins 1993).

## HISTORICAL BACKGROUND

In the 1920s, the Twin Cities area was a compact rail/streetcar city. Most of the 670,000 people lived within about 80 square miles (Metropolitan Council 1992b). The residential pattern focused upon jobs in the main railway corridor from North Minneapolis to South St. Paul.

### FIGURE 1 Core Areas--1920s, 1980s




The Twin Cities Area in the 1920s was a compact rail/streetcar city. Most of its 670,000 people lived within about 80 square miles--an area focused on jobs in the main railway corridor from North Minneapolis to South St. Paul.

The Twin Cities in the 1980s, encompassing 800+ square miles, containing over three times the 1920 population and reflecting auto-era development. Social, economic and technological changes, including the highway system, made possible this spread of development.

Source: Metropolitan Council, 1992

This point can be illustrated in the left hand map in the figure above. The map on the right shows the region in the 1980s, where the regions activity encompassed 800+ square miles.

Ten times the amount of land is used for only three times the 1920 population. Social, economic and technological changes, including the highway system, made possible this spread of development and subsequent low residential densities (Met Council 1992b)

This pattern of decentralization should continue into the future. In 1970, about 56 percent of the region's jobs were located in the central cities of Minneapolis and St. Paul. By 1990, the central cities' job share had declined to 40 percent and by 2010, it will be just over 30 percent. During the same period, the share of jobs in the inner and developing rings grew from 40 to 56 percent of the region's employment (Metropolitan Council 1992b).

**Transportation Policy Framework**

The establishment of overall transportation policy for the Minneapolis-St. Paul metropolitan area is the responsibility of the Metropolitan Council. The results of increasing traffic levels are air pollution, decreased mobility, congestion and other problems. All of these will occur if the Twin Cities area continues to rely upon single occupant cars to move hundreds of thousands of people every day (Metropolitan Council 1992b).

The Met Council is determined to approach traffic problems with a high occupancy vehicle strategy. Many different transit tools are required to meet the needs of the region and plans advocate a multiple-strategy approach to moving people. The Metropolitan Council's Regional Transit Facilities Plan of 1992 focuses upon favoring multioccupancy vehicles, which include LRT, buses, carpools, or vanpools. Proponents of LRT development see these supportive plans and policies as being in favor of a fixed-guided mode of moving large numbers of people around the metro area.

Funding from the State Legislature has been slow to support an LRT strategy. The 1993 legislative session closed without any new supportive tax or dedicated funding for

capital intensive transit projects like LRT (Willens 1993). Further discussion of funding is explored in the "Financial Feasibility" section below. The following section details the first two corridors to be implemented if and when funding becomes available.

## PROJECT BACKGOUND

To combat decentralization and all the associated problems it causes with the region's transportation systems, the Metropolitan Council has determined that LRT is one multioccupacy vehicle strategy that can be implemented to solve congestion problems (Metropolitan Council 1992b).

To develop LRT, and to make it sucessful, several agencies will need to coordinate their efforts. The idea of developing a rail system to facilitate the region's transportation needs is not new. In the early 1970s, the Metropolitan Transit Commission (MTC) was planning heavy rail for the Twin Cities. This system had a very prohibitive price and in 1979, the Metropolitan Council put a moratorium on rail planning. In the early 1980s, the study of LRT was seen as a way to resurrect the rail alternative. Hennepin and Ramsey counties developed Regional Rail Authorities to plan Light Rail (Blin 1993a). Anoka, Washington, Dakota, Scott and Carver counties created their own Regional Rail Authorities as well. In 1988, the Metropolitan Council stepped in to put a stop to all LRT planning by the various Authorities. The Council felt that a narrowing of the proposals was needed. The Metropolitan Council felt that any system created needed to be a regional system and should be administered by a regional agency, a state level agency, or both.

In the early 1990s, the State Legislature acted to create the Light Rail Transit Joint Powers Board, which is made up of the MTC, and the following counties: Ramsey, Hennepin, Scott, Dakota, Anoka and Carver. However, in 1993, the Legislature selected Mn/DOT as the

lead agency that will plan and implement LRT, with oversight by the MTC (Whittaker 1993).

Mn/DOT works closely with the RTB in a number of ways, including:

- participate in corridor studies to identify how travel demand strategies can become part of the transportation solution for congested roadways;
- review and approve light rail transit funding applications from the county regional railroad authorities, and;
- coordinate overall transit and transportation policies to maximize efficiency and effectiveness of the transportation system (RTB 1993d).

Mn/DOT also works closely with the County Regional Railroad Authorities in developing their Alternatives Analysis / Environmental Impact Statements (AA/EIS) (Blin 1993a). The County Regional Railroad Authorities request funding from the RTB and plan approval from the Met Council.

**The First Corridors Planned - Project Description**

The RTB has proposed a two-phase LRT system: a Central Corridor and an I-35W / South Corridor. These two lines have the highest performance characteristics of all the original nine LRT lines considered by the RTB in a reevaluation of LRT priorities (see table in Appendix 4 for breakdown of characteristics of all lines considered) (RTB 1990c).

The proposed two line system constitutes a major downsizing of the previous maximum "10 year LRT plan," adopted by the RTB in 1990, which included nine lines and two extensions (Blin 1993c). The latest proposal introduces cost-reduction measures, particularly as they relate to the Minneapolis downtown surface vs. tunnel alignments (Metropolitan Council 1992b).

According to the 1992 Regional Transit Facilities Plan, the preliminary capital costs of the proposed lines are as follows:

| | |
|---|---|
| **Central Corridor** | $ 474 million[1] |
| **I-35W Corridor** | $ 350 million |

The cost figures above for the I-35W alignment assumes a surface alignment (no tunnels). The exact alignment of the downtown to 29th St. segment is being studied at the time of writing (Lyons 1994). The cost per passenger carried, including capital and operating costs, are $5.30 for the Central Corridor and $4.65 for the I-35W line. These are the lowest figures for any of the lines considered by the RTB (Metropolitan Council 1992b).

The Central Corridor is expected to carry 32,400 riders per day (2010 forecast) and the I-35W Corridor is forecasted to carry 31,000 (Lyons 1993). These figures are significantly higher than those predicted for other possible lines in the region. These figures also compare favorably to other successful LRT lines currently in operation in North America (RTB 1990c). The RTB recommendation indicates that corridor segments be constructed as funding becomes available. The table in Appendix 4 further illustrates the projections and costs for the corridors.

## The Central Corridor

The Central Corridor, extending approximately eleven miles from the Lowertown area of downtown St. Paul to the Convention Center in downtown Minneapolis, is the region's highest priority corridor for transit improvements (RCRRA 1992b). See figure 2 following this page for alignment selection and station location. This corridor lies entirely within a well

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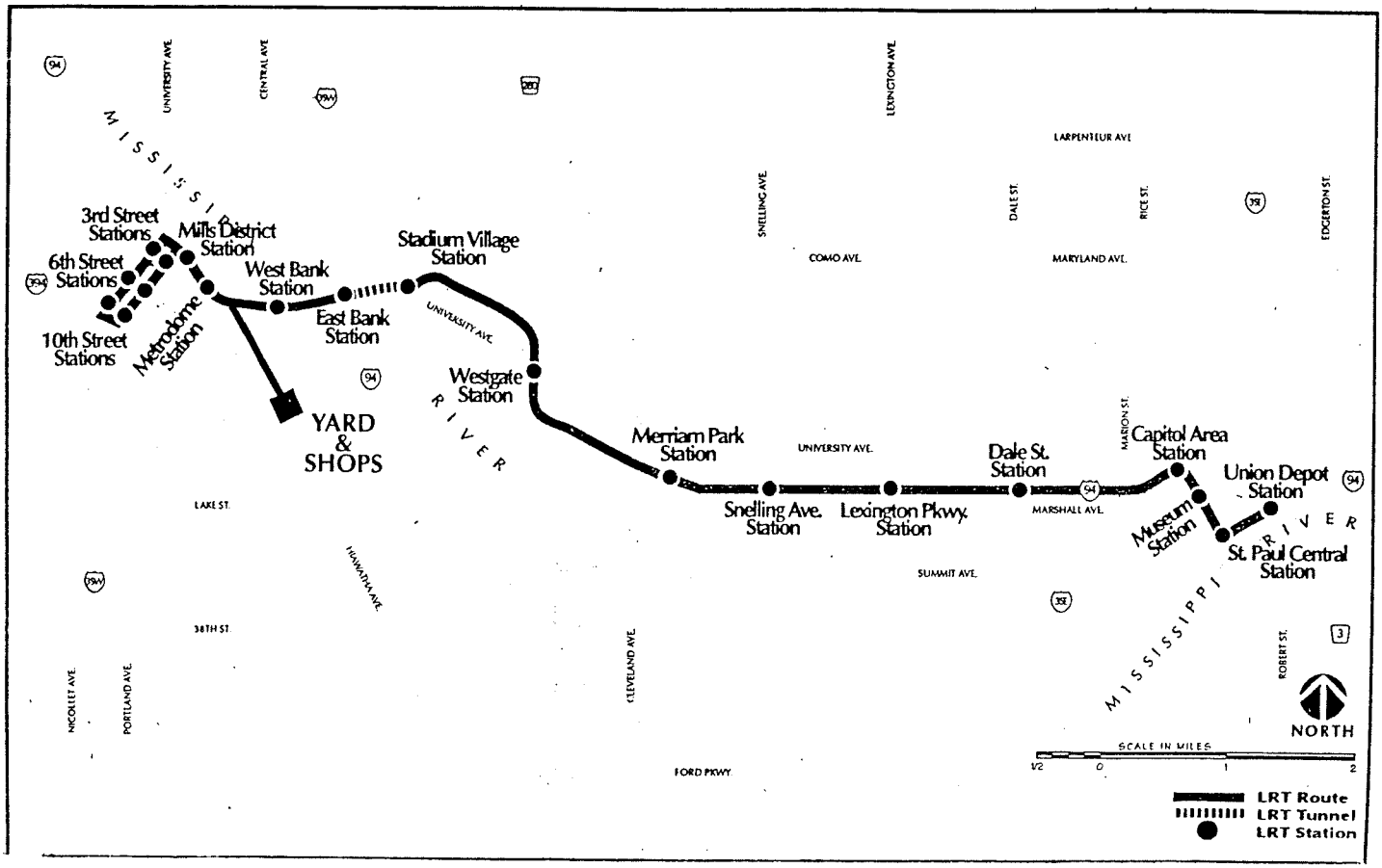
[1] $ 219,000,000 of the $ 474 million is for facilities that will benefit system expansion. This includes project startup costs, maintence facility, etc.

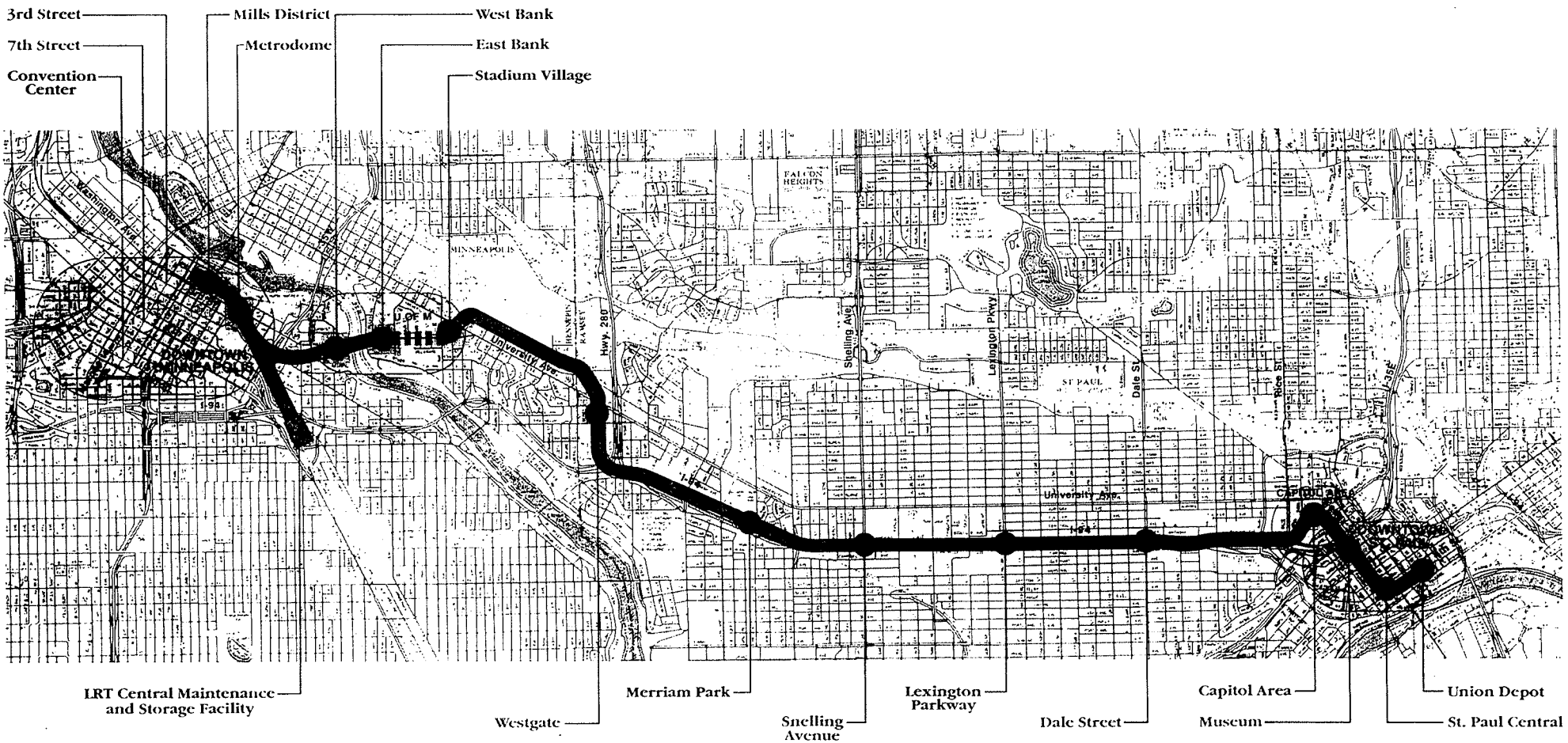
developed, urban area with an established and heavily used transit system. The corridor contains multiple land uses: two central business districts, medium density mature neighborhoods with large transit dependant population, the main campus of the University of Minnesota and it's hospital complex, a 65,000 seat stadium, a convention center, the State Capitol, and several commercial and historic districts (Goski 1993c).

**FIGURE 2 The Central Corridor Alignment**




Source: Central Corridor Connection, Ramsey County Regional Rail Authority.

# Map 1 The Central Corridor Alignment in Detail




**CENTRAL CORRIDOR TRANSIT ALIGNMENT**

Legend:

- Proposed Alignment
- Alignment Study Area
- Tunnel
- Proposed Station
- Station Location Study Areas
- Major Transit Generators

10/5/92

NORTH

0 1500 3000

BRW

Source: BRW

Approximately 125,000 jobs are located in downtown Minneapolis. Another 50,000 are located in downtown St. Paul, and an additional 80,000 plus jobs are spread out along the corridor. The University of Minnesota and its major medical complex has a student enrollment of 41,000, 18,000 staff and faculty, making the main campus the region's third most concentrated trip generator. In addition to serving the heavily developed area between the downtowns, the Central Corridor serves as the spine of the regional transit system (Lyons 1993, Goski 1993c). The two central cities are the most frequent transit destinations but also serve as transfer points to employment and activity centers throughout the Twin Cities (Goski 1993c).

If implemented, the Central Corridor LRT line will replace the current express bus Route 94 and part of Route 16 (Dillery 1993). Local radial route 16, which travels between the two downtowns via University Avenue, may lose some riders, but the route will most likely benefit from increased transit riders that use the circulator routes which will support the stations. The financial success of routes 16 and 94 is also a reason why the Central Corridor has first build priority for LRT in the region.

| | |
|---|---|
| Average per passenger subsidy for Express Route: | $ 2.50 (Weekdays) |
| Average per passenger subsidy for **Route 94:** | **$ .55** " |
| | |
| Average per passenger subsidy for Radial Route: | $ 3.25 " |
| Average per passenger subsidy for **Route 16:** | **$ .52** " [2] |

This data suggests that these two routes are highly successful. Because of their large

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[2]This information is from January 1993 Route Profiles, courtesy of John Dillery, Service Planner, MTC.

patronage they are almost self supporting. The Ramsey County Regional Railroad Authority believes that the LRT line will handle the 94 bus users, and capture enough new transit riders to produce an estimated 2010 projection of 32,000 daily riders (Lyons 1993).

An Alternatives Analysis / Environmental Impact Statement for the Central Corridor by the Federal Transit Administration, Mn/DOT, Hennepin County Railroad Authority and Ramsey County Railroad Authority was released in early December. A draft AA/EIS, which was released November 1993, examines four alternatives for the Central Corridor:

1. No-Build
2. Transportation System Management (TSM)
3. Busway
4. LRT

At one end of the spectrum is the No-Build Alternative, which would have the lowest short-term public costs, but is believed to have the highest long-term total public and private costs, including financial, social, environmental and transportation costs (projected increases in congestion, of vehicle miles traveled, etc.). At the other end of the spectrum is the LRT Alternative. LRT would have the highest short-term public costs but is believed to have the lowest long-term total public and private costs in both the Central Corridor and across the region (Mn/DOT 1993a).

The Busway and LRT Alternatives represent much greater commitments to a high-quality transit in the Central Corridor than the No-Build or TSM Alternatives (FTA 1993c). Therefore they are projected to attract more new transit riders, decrease the dependance upon single occupant vehicle lanes, and confer certain environmental benefits, such as less air and water pollution, less energy consumption, less property acquisition, less urban sprawl and less impact on sensitive sites (FTA 1993c).

The LRT and the busway alternatives have social impacts as well. They would result in some property takings and displaced residents. Lower income people living within the Central Corridor would have increased public transportation choices.

At the time of writing, Ramsey County Regional Railroad Authority (RCRRA), Hennepin County Regional Railroad Authority (HCRRA), RTB, Mn/DOT and the Metropolitan Council have yet to arrive on a selected alternative mode for the Central Corridor. The information in the AA/DEIS seems to indicate that LRT has a slight edge over the busway alternative to be selected as the mode appropriate for the corridor. Before announcing the prefered alternative, the Joint Lead Agencies (JLA) of Mn/DOT, Hennepin and Ramsey County Railroad Authorities are further exploring the issues of a tunnel in downtown Minneapolis, "low floor" vehichles vs. high platform cars, and the economic development benefits of LRT (Lyons 1994). These three studies should be complete in the fall of 1994, with the prefered alternative decided upon by the JLA in late 1994 or early 1995.

The AA/DEIS lists many advantages of LRT that fit the goals of the RTB and the Metropolitan Council in terms of reducing overall vehicle miles traveled, moving people in multioccupancy vehicles and preserving established transit corridors. The advantages of implementing LRT according to this document include:

- LRT would result in 2,656 fewer auto trips than the TSM alternative; increased transit ridership during peak periods reduces the need for additional highway capacity.
- Additional capacity can be added by linking additional vehicles to lead vehicle. Does not require further labor costs.
- Serves a high percentage of people who depend on transit.
- Could accommodate bicycles.
- Preserves remaining freeway capacity.

## I-35W / South Corridor

At the present time, the I-35W / South Corridor will be constructed from the Convention Center in downtown Minneapolis to 96th St. South in Bloomington, with a planned second construction phase to extend service to Burnsville Center.

Since construction of the I-35W Corridor will commence after the start up, and possible completion of the Central Corridor, it is difficult to state exactly where the line will be constructed. The plan is to construct LRT in the freeway median from 29th St. to 96th St., although it may come out of the median at 96th to directly serve a transit station. Different alignments are being considered north of 29th St. including Nicollet Ave. and on the sideslopes ajacent to the freeway (Lyons 1994).

Light Rail Transit has been determined to be most effective in some ridership projections in bus corridors that are already highly utilized. I-35W is the largest transit use corridor in the state and is also the most congested (Lyons 1993). In addition, there are over 8 million trips per day in the Twin Cities; at least ten percent occur somewhere along some part of the 18 mile section of freeway from downtown Minneapolis to Burnsville (SRF 1992c). Projected figures for 2010 indicate that congestion will be very high. Projections also indicate high transit needs and opportunities (Met Council 1992b).

To make LRT successful in the I-35W Corridor, planners and planning agencies are looking for new transit riders. One theory is that 10-15% of LRT users will be former auto commuters. As a result, congestion relief will occur along the I-35W Corridor, especially if these auto conversions to transit occur during peak periods (Lyons 1993).

The draft AA/EIS for I-35W / South Corridor was released in March of 1992. For the Corridor, this document includes a no-build alternative and four build alternatives. The no-

build alternative would not add capacity, but would require extensive work to pavement and bridges at a cost of at least $235 million (Met Council 1992).

The four build alternatives are:

1. **Lane Conversion**, which adds an HOV lane south of 46th St. and converts an existing lane between 46th and downtown Minneapolis.
2. **Lane Conversion + LRT**, which adds an LRT line to the previous alternative in the middle of the freeway.
3. **Diamond Lanes**, which adds an HOV lane north of 46th St. and an HOV lane and a mixed-use lane south of 46th.
4. **LRT (median or Soo Line)**, which adds an LRT line for the entire length of the corridor and an additional mixed-use lane south of 46th St.

In the above listed build alternatives, LRT costs assume the I-35W LRT line terminates at 96th St. in Bloomington, and the Central Corridor LRT construction will have already provided tracks through downtown Minneapolis to the Convention Center and support facilities (SRF 1992).

All four build alternatives have very high capital and right-of-way acquisition costs, ranging from $700 million for the lane conversion to over $1 billion for the LRT and LRT-plus-lane conversion options.

A major difference between alternatives is the reserve capacity provided to satisfy future needs beyond the forecast year (2010). This indicator is particularly important to consider. The reconstruction of I-35W could take up to 20 years and once any of the build alternatives were implemented, additional improvements will be needed to accommodate increasing demand (Met Council 1992). The lane conversion option offers the lowest future reserve capacity. This would barely satisfy the corridor's travel-demand needs on opening date, let alone the needs beyond 2010.

For I-35W, the LRT-plus-lane conversion offers the greatest reserve capacity. The dual transit component of LRT and an HOV lane could carry, if needed, 2,000-3,000 more people per hour than either the diamond lanes or the LRT only options (SRF 1992c). This assumes LRT frequencies of a train every 5-6 minutes. For further mode comparisons, see Appendix 1.

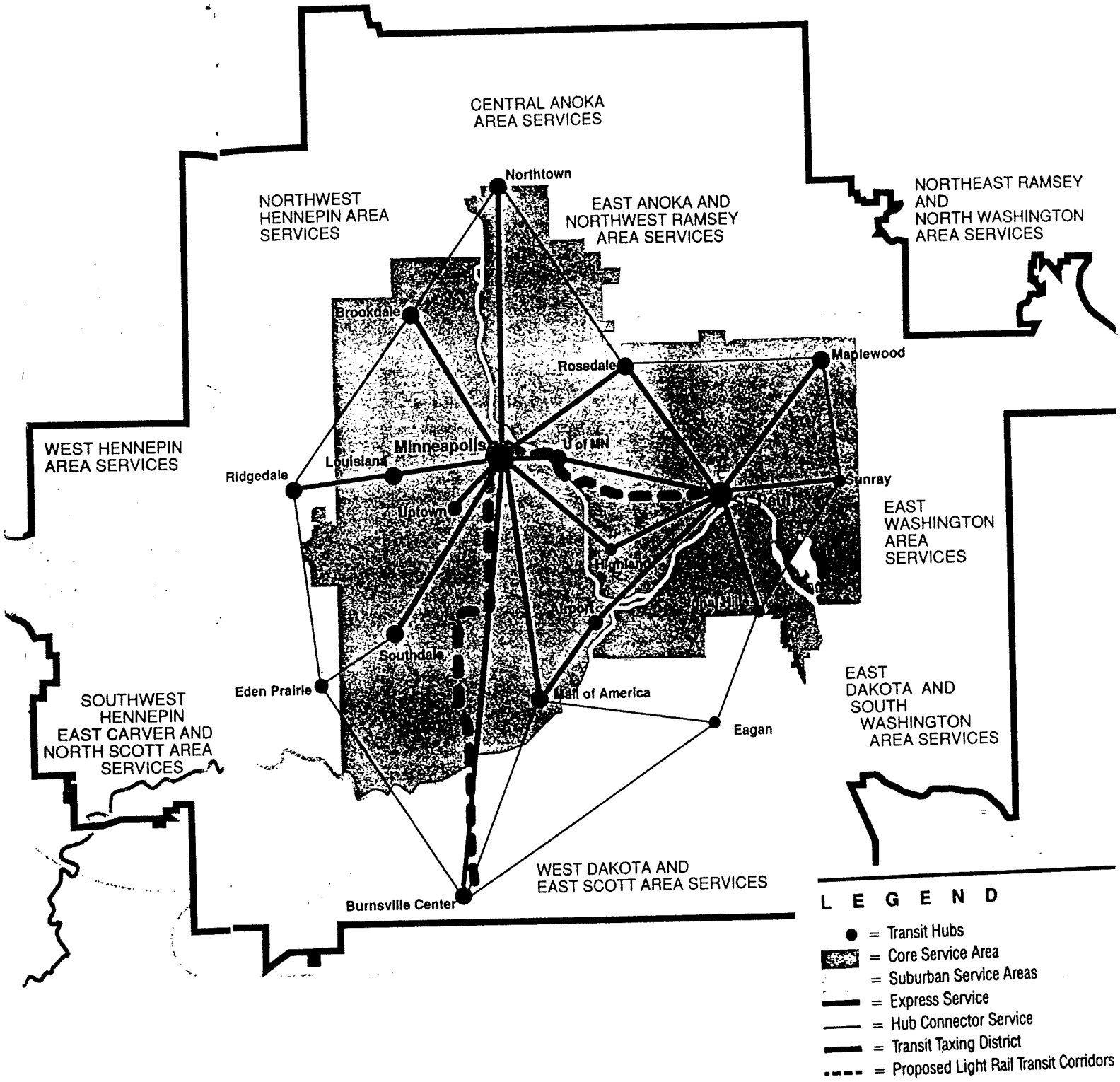
**Transportation Planning**

The Metropolitan Council sees LRT being used in the Twin Cities as a transportation tool and a land use tool (Lyons 1993). The Council stresses that LRT is but one multiple passenger vehicle mode being examined. HOV lanes, commuter circulators, improved bus service in core and outlying areas as well as LRT are also being considered for implementation. The Regional Transit Board would like to see LRT used as a "backbone" of a reorganized transit system (RTB 1992a). See map on following page.

LRT will alleviate congestion in the corridors it serves in terms of levels of traffic during peak periods, but LRT is also seen as a way for communities to revitalize areas surrounding the corridors. The Metropolitan Council requires communities to do LRT land use plans for station areas which they submit to the Met Council for approval. However, this use of LRT as a development tool will not abate the sprawl of the region (Lyons 1993). Rather it will help channel a portion of the regions new growth and redevelop and preserve existing corridors and established neighborhoods within the Twin Cities. This is analogous with the Met Council's stated strategies for coordinated regional transit/land development (Met Council 1992b).

The revitalization of areas around stations will serve as a centerpiece to channel growth in to the areas. This will not happen without the proactive involvement of affected

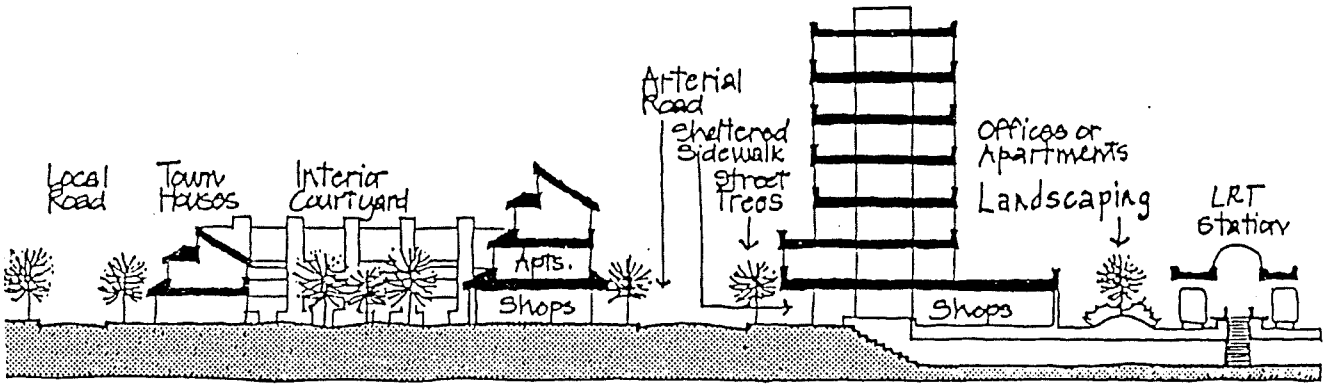
## Map 2 LRT As Backbone of A Reorganized System




Source: RTB's Vision for Transit

cities. The figure below illustrates what the environment around an LRT station might look like in a community.

**FIGURE 3 Transit and Land Use Components Combined**




What an LRT or HOV- lane station might look like

Source: Met Council, Regional Transit Facilities Plan.

The drawing is a pedestrian oriented, high residential density area, with a mixed land-use component. Several stations in the Central Corridor are located in the center median of Interstate 94. These stations are: Dale Street, Lexington Parkway and Snelling Avenue (see Appendix 9). However there are a few stations along the Central Corridor that are not in freeway medians. They are located in established neighborhoods outside the central business districts of the two downtowns that are already mixed-use areas, but would

benefit from redevelopment. These include: Westgate, Franklin Avenue, Stadium Village, East Bank and the West Bank stations.

The largest return in terms of ridership will come from addition of moderate to higher density residential development around LRT stations. The Met Council is advocating that the cities consider rezoning for higher density residential with mixed uses around stations and creating pedestrian friendly environments (Lyons 1994). See Figure 3 above.

In the Central Corridor, the biggest impact for land use potential is likely at the Westgate Station (Lyons 1993). Near the station is the Court International Building, which is an office building. Directly across University Avenue is a vacant parcel of land that the City of St. Paul has been interested in developing for a few years. Currently, there are signs posted by the St. Paul Port Authority, which advertise lots for sale.

Within the 1/4 mile/five minute walking distance are industrial areas, commercial sites and low and medium residential areas. Within 1/2 mile/ten minute walking distance is the Prospect Park neighborhood of Minneapolis. The cars parked on the street, the size of the houses and trees indicate that this neighborhood is an established, upper middle-class professional area. Because of their economic situation, and their physical proximity to I-94 and Mn 280, one might conclude that they are not big public transportation users. Yet census tract information indicates that the people living in this portion of Minneapolis are high transit users. Census information also reveals that this tract has a low percentage of zero car household concentration (Lyons 1994a).

Projections by the RTB, Mn/DOT and the MTC indicate that as many as 32,000 fewer people will be in cars or buses on Interstate 94. Peak period congestion will undoubtedly be affected. A mind set of "now that there is LRT, the freeways are less crowded for my

commute," may prevail and a possible future attraction to the interstate may result through triple convergence.

## Financial Feasibility

The Financial Analysis Results Report prepared for the Central Corridor projects the future funding needs and opportunities with and without major transportation improvements in the Corridor. The analysis focuses on the financial implications of a Central Corridor transit investment (FTA 1993).

Federal funding is uncertain, but is assumed to be available in the range of 50-80 percent for the Central Corridor. Locally, a dedicated source of state transit funding has not yet been approved by the Minnesota Legislature or the Governor. Such a new source would be in addition to the current dedicated transit tax now levied by the RTB in the Transit Taxing District of the Twin Cities ( FTA 1993). See Transit Taxing District of the Twin Cities map in Appendix 11.

Under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), equal treatment is called for in the funding of transit and highways. Under section 3, "new starts" are funded up to 80% federal with 20% local funding. Cities across the nation are competing for these limited funds (Mn/DOT 1993c). An approach favored throughout the Twin Cities is to ask for 50% federal funding and match with 50% local. Transportation professionals feel that asking for less than the 80% maximum will increase chances of being awarded federal funding.

Currently, the predominant sources of operating funding are local property tax levies and passenger fares (Blin 1993c). State subsidies ($29 million in 1992) come from the

general fund. Federal subsidies, principally from the Section 9 program, total $8.4 million per year (FTA 1993).

Even though there seems to be broad public support for LRT, the State Legislature and Governor Arnie Carlson seem reluctant to provide a dedicated tax for LRT implementation. Carlson supported a $.05 gas-sales tax early in 1993 and then withdrew his support. Carlson determined this past spring that he will not accept more tax increases this legislative session. There are always many competing hands reaching into the fiscal pie at the Capitol for various programs. In realizing transportation planning, one must never overlook the political perspective; the Governor is up for re-election in November.

## ANALYSIS/RECOMMENDATIONS

Funding a project like Light Rail Transit is always difficult. Planners, government officials and regional agencies will have to become more creative if LRT is to be implemented. A pragmatic approach to implementation with a pedestrian-oriented development should be kept in mind as well.

To make LRT or any multi-occupancy transit development a reality for the Twin Cities, appropriate funding needs to be secure. Dedicated funding from the general fund, or an additional tax from sources such as the Motor Vehicle Excise Tax (MVET), a motor fuel sales tax, motor fuel excise tax (or at least consistent support from the Governor), an auto repair sales tax or a general sales tax of 1/2 to 1 percent are needed to meet the necessary capital and operating requirements.

The public support seems to exist. There is unrealized money out there, taxes will have to be assessed, both regressive and progressive. A sales Tax and an excise tax on

motor vehicles carry high potential funding. A 1 % sales tax for the Twin Cities region would generate $158 million per year ($3.16 billion over 20 years) and a 6 % Motor Vehicle Excise Tax would generate $45 million per year ($900 million after 20 years) (Rafter 1993b). Other cities have used regional taxes this way. San Diego planned and implemented two trolley lines without federal support. In 1987, San Diego imposed a 1/2 % sales tax on the region, which the citizens supported through a vote. This is projected to generate $2.5 billion over the next twenty years (Curcio 1989).

San Diego also came under budget when the first two lines were completed (Curcio 1989). Planners within the various bureaucracies in the San Diego Metropolitan Development Board had an economical, pragmatic style in the Trolley's implementation. The Trolley recovers over 85 % of its operating costs from the farebox (Curcio 1989). This is something the RTB and the MTC should examine to encourage similar success here.

Pedestrian-oriented development is a highly important consideration when planning a high-occupancy vehicle mode like LRT. Surface alignments in both downtowns should be realized. Plans for tunneling through downtown Minneapolis would severely fracture the commercial and shopping patterns offered by the streets and skyways. At-grade alignment running south on Marquette Avenue and a return northbound on 2nd Avenue would facilitate an expansion of downtown Minneapolis as a pedestrian-friendly environment, of which Nicollet Mall contributes already.

Developing station areas, like the Westgate Station in the Central Corridor, offer potential for planners to redefine a neighborhood. This could be achieved by emphasizing the strong positive characteristics, while simultaneously "fixing" or retrofitting areas where the current residential/commercial uses are not effectively designed for the pedestrian.

If funding can be delivered by the local and state officials, I believe that LRT can be an effective transportation mode to reduce congestion and facilitate redevelopment of established areas. LRT is a tool with a high initial price tag, capital development is in the hundreds of millions of dollars, which is far cheaper than comparable capital development for freeways and eventual repair.

Reluctant elected officials should look at comparison pricing for freeway development vs. LRT development. Then they might study the projected maintenance costs of these facilities, and the ease in which LRT can accommodate future demand, while freeways usually cannot without hefty capital outlays.

Economic development and job creation can be realized with LRT development also. The American Public Transit Association estimates that each $ 10 million in capital investment in transit generates 770 jobs. The city of Buffalo attributes $ 200 million in development comittments to LRT following its first year of construction. Lease values in San Diego increased $ 10 per square foot after LRT construction. In Portland, the city has had 69 development projects worth over $ 1 billion immediately adjacent to LRT since 1987 (RCRRA 1994).

The Metropolitan Council indicates that it is reasonable to assume that 10% of the region's projected growth over the next 20 years could be channeled around LRT stations in the two proposed corridors (Goski 1994).

I support LRT because of the mode's flexibility in adjusting for future demand, ability to respond to technology enhancements and inexpensive operating and maintenance requirements. The studies and research support a high-occupancy vehicle investment to help the economic, commercial, residential and industrial environments of the Twin Cities.

LRT is an attractive redevelopment tool for urban planners. Rail transit invesments can be coupled with urban revitalization and community investment funds to create or reestablishment pedestrian oriented neighborhoods that are safe, livable, walkable communities. Light Rail Transit should be given a higher priority to other modes to achieve multi-occupancy vehicle goals.

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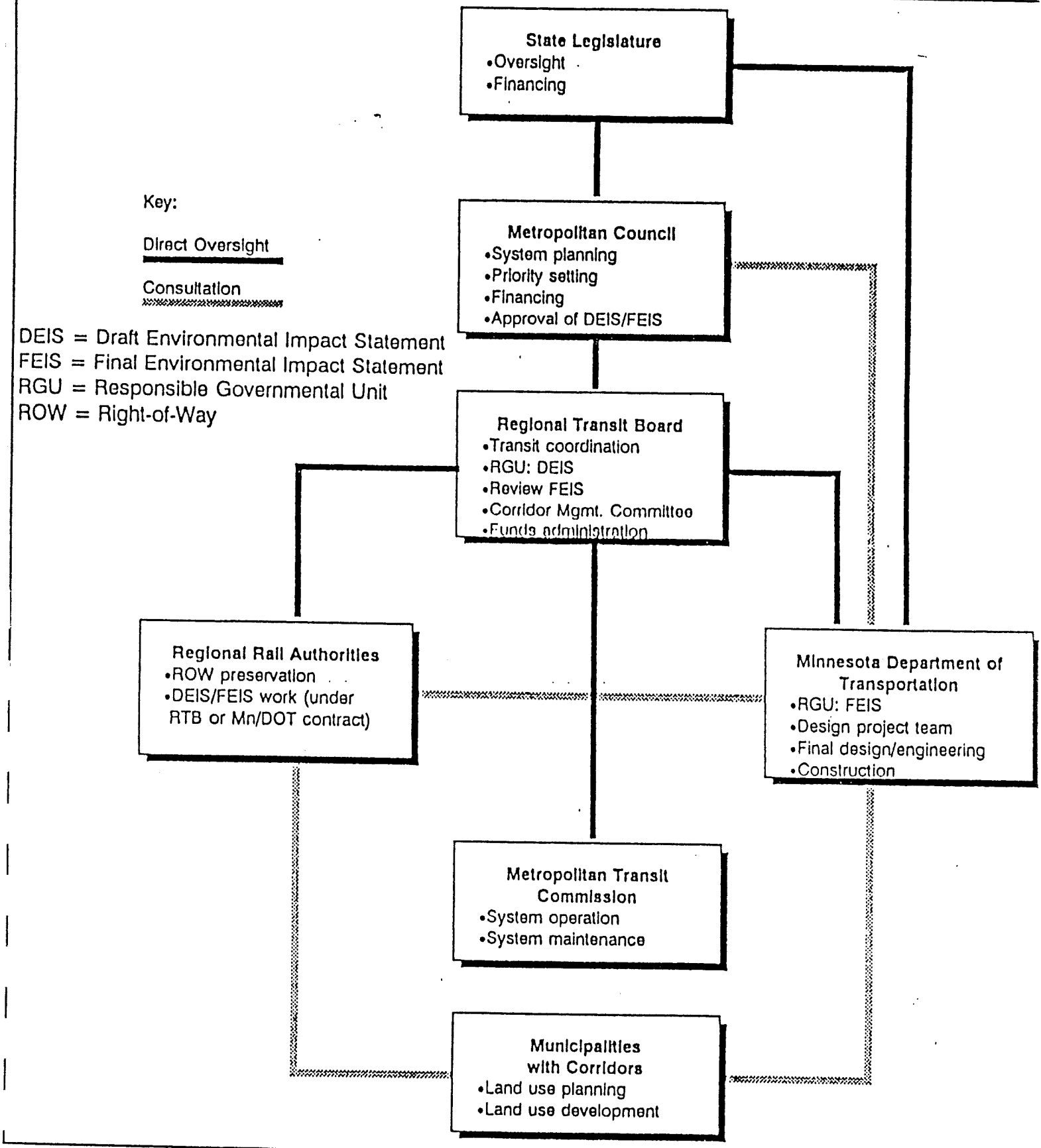
# Appendix 1

Carrying capacity of single lane - one hour:

| | |
|---|---|
| Passengers in cars on surface streets | 1575 |
| Passengers in cars on elevated street (freeways) | 2025 |
| Passengers in bus on surface street | 9000 |
| Passengers in streetcar on surface street | 13,500 |

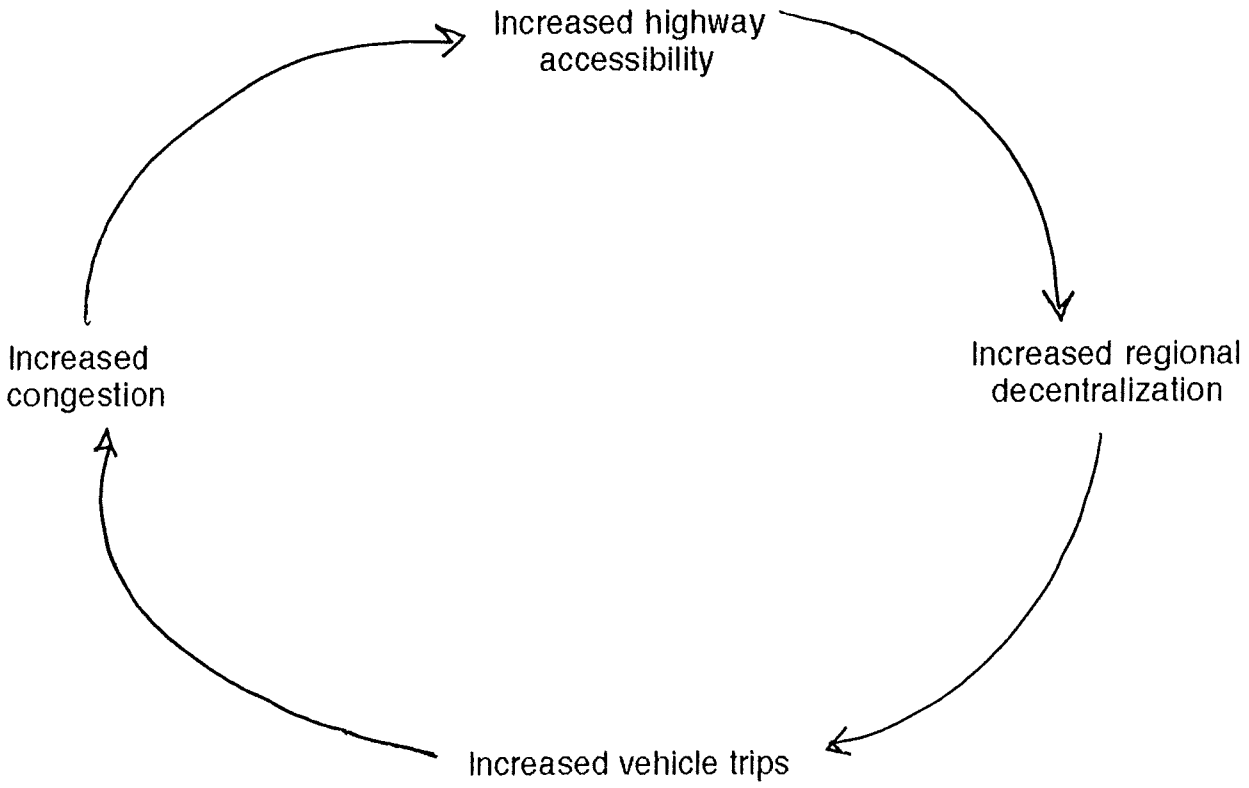
APPENDIX C

Figure 6.1 Governance Framework for Light Rail Transit



# Appendix 3

## More Highways Lead to More Congestion




Building additional mixed-use highway lanes alone would only encourage greater automobile use and promote increased decentralization, adding more vehicle trips, increasing traffic congestion, especially near major job concentrations (downtown Minneapolis, downtown St. Paul, Mall of America, University of Minnesota, etc.), and leading for a demand for more lanes - a vicious cycle. What is needed is to boost transit ridership and car-occupancy levels.[2]

---

[2]From the Metropolitan Council's 1992 "Regional Transit Facilities Plan," p. 13.

# Ridership and Infrastructure/System Costs [1]

| Corridor | 2010 ridership | Passenger Miles | Capital costs [2] | Estimated LRT oper. & maint. costs | Cost / passenger | New transit riders |
|---|---|---|---|---|---|---|
| Central<br>CBD to CBD | 32,400 | 159,000 | $469 m. | $10.7 million | $5.50 | 2,900 |
| I-35W<br>Washington Ave.<br>to 96th St. | 31,000 | 208,000 | $350 m. | $12.1 million | $4.50 | 6,600 |

[1]This is an adaptation of Table 4.2 of the Metropolitan Council's "Regional Transit Facilities Plan." For a more detailed breakdown, please see the complete table on page 23 of that document.

[2]This assumes an at-grade alternative to Hennepin County Regional Railroad's initial plan of constructing a tunnel through the downtown Minneapolis area. Alignment and cost calculations are very preliminary. A tunnel seems to add more new riders, while constructing at-grade reduces costs tremendously.

APPENDIX 4

**Table 4.2 Light Rail Transit Corridor Comparison: Corridors without Mineapolis Tunnels, with Infrastructure/System Costs**

| Corridor | 2010 Ridership[2] | Passenger Miles[3] | Capital Cost with Mpls. At-Grade Alignment[4] | Annual Capital Cost | Estimated LRT Operating & Maintenance Cost[5] | Annualized Ridership (306 Days) | Cost per Passenger | New Transit Riders |
|---|---|---|---|---|---|---|---|---|
| Group 'A' | | | | | | | | |
| • *Central* CBD to CBD-11.4 miles (Soo Line/I-94 Alignment Alternative) | 32,400 | 159,000 | $469 m | $42 m | $10.7 m | 9.9 m | $5.50 | 2,900 |
| Group 'B' | | | | | | | | |
| • *I-35 W* to 96th Street-8.8 miles | 31,000 | 208,000 | $350 m | $32 m | $12.1 m | 9.5 m | $4.50 | 6,600 |
| to 66th Street-5.1 miles | 21,500 | N/A | $316 m | $28 m | $9.7 m | 6.6 m | $6.00 | 4,600 |
| • *Hiawatha* to GSA-7.4 miles | 17,500 | 82,000 | $340 m | $31 m | $8.9 m | 5.4 m | $7.50 | 2,400 |
| • *Mpls. Northeast* to Northtown-10.7 miles | 18,300 | 128,000 | $329-333 m | $30 m | $9.3 m | 5.6 m | $7.00 | 4,500 |
| to I-694-6.6 miles | 14,100 | N/A | $268 m | $24 m | $7.5 m | 4.3 m | $7.50 | 3,500 |
| • *Mpls. Northwest* to 63rd Avenue-10.2 miles | 21,900 | N/A | $345 m | $31 m | $9.2 m | 6.7 m | $6.00 | 5,600 |
| • *St. Paul South* to Upper 55th-6.7 miles | 11,300 | 55,000 | $238 m | $21 m | $6.6 m | 3.5 m | $8.00 | 3,900 |
| Group 'C' | | | | | | | | |
| • *Mpls. Southwest* to T.H. 169-9 miles | 18,500 | 94,000 | $360 m | $32 m | $9.3 m | 5.7 m | $7.50 | 3,100 |
| • *St. Paul Northeast* to I-694-8 miles | 10,400-10,900 | N/A | N/A | N/A | $6.8 m | 3.2-3.3 m | N/A | N/A |
| • *St. Paul Northwest* (to Co. Rd. C) | 13,500[6] | N/A | $113 m[6] | N/A | N/A | N/A | N/A | N/A |
| • *Hiawatha Extension* (to Airport) | 800[6] | N/A | $70 m[6] | N/A | N/A | N/A | N/A | N/A |
| • *I-35 W Extension* (to T.H. 13) | 900 | 7,300 | $57 m | $5 m | N/A | .3 m | N/A | N/A |
| (to Burnsville Center) | 1,000 | 8,200 | $29 m | $3 m | $3 m | .3 m | N/A | N/A |
| • *I-35 W* - Downtown Mpls. to Burnsville Center | 32,900 | 270,000 | $436 m | $39 m | $15.1 m | 10.1 m | $5.50 | 9,600 |

[1]An at-grade alternative to replace the downtown tunnel in Minneapolis was conceptually developed by HCRRA staff at the request of the RTB. Although briefly discussed with Minneapolis, this alternative has not been reviewed or approved by Rail Authority members or the City of Minneapolis. Alignment and cost calculations are very preliminary, and do not represent a level of analysis comparable to other portions of the HCRRA Stage I system. Connections to corridors at both ends in particular will require additional analysis. For shortened I-35W and Minneapolis Northeast Corridors, estimates are also very preliminary and will require additional analysis.

[2]As modeled for tunnel system. Individual corridor alone. With Central Corridor built, each other corridor increases 400-900. The Central Corridor also picks up additional riders with each additional corridor built (see Ridership chart). Source: Metropolitan Council.

[3]Source: Metropolitan Council (passenger miles/trip).

[4]Excludes right-of-way; includes light rail vehicles except on I-35W. See also Note 1.

[5]LRT portion only; stand-alone basis.

[6]Amount reported in Development and Financial Plan in 1991 $. No additional work has occurred.

# Appendix 6

## Goals and Benefits of Transportation Improvements

The goals and benefits of the Metropolitan Council for transportation improvements involves coordinating transit-oriented investments with land use to preserve the Twin Cities Metropolitan Area's ability to function as a single economic and social entity[3]. The regional benefits include:

- Less consumption of land: more growth would be focused around higher densities in people-friendly developments.
- Less traffic generation: transit development generates fewer vehicle trips.
- Less air pollution: a higher percentage of travel in heavy-traffic corridors would be using transit of carpools instead of the single-occupant auto.
- Less energy consumption: the "productivity" of energy would increase because of moving more people via transit and ridesharing, and the region would have greater protection against unforseen energy shortages.
- More human scale urban and suburban environments: hub development would be an attractive destination. Hub residents, workers and shoppers would have a broad range of opportunities available without having to use an automobile to access them.
- Less need for costly urban services: Higher development densities could make more efficient use of sewer and other public facilities.

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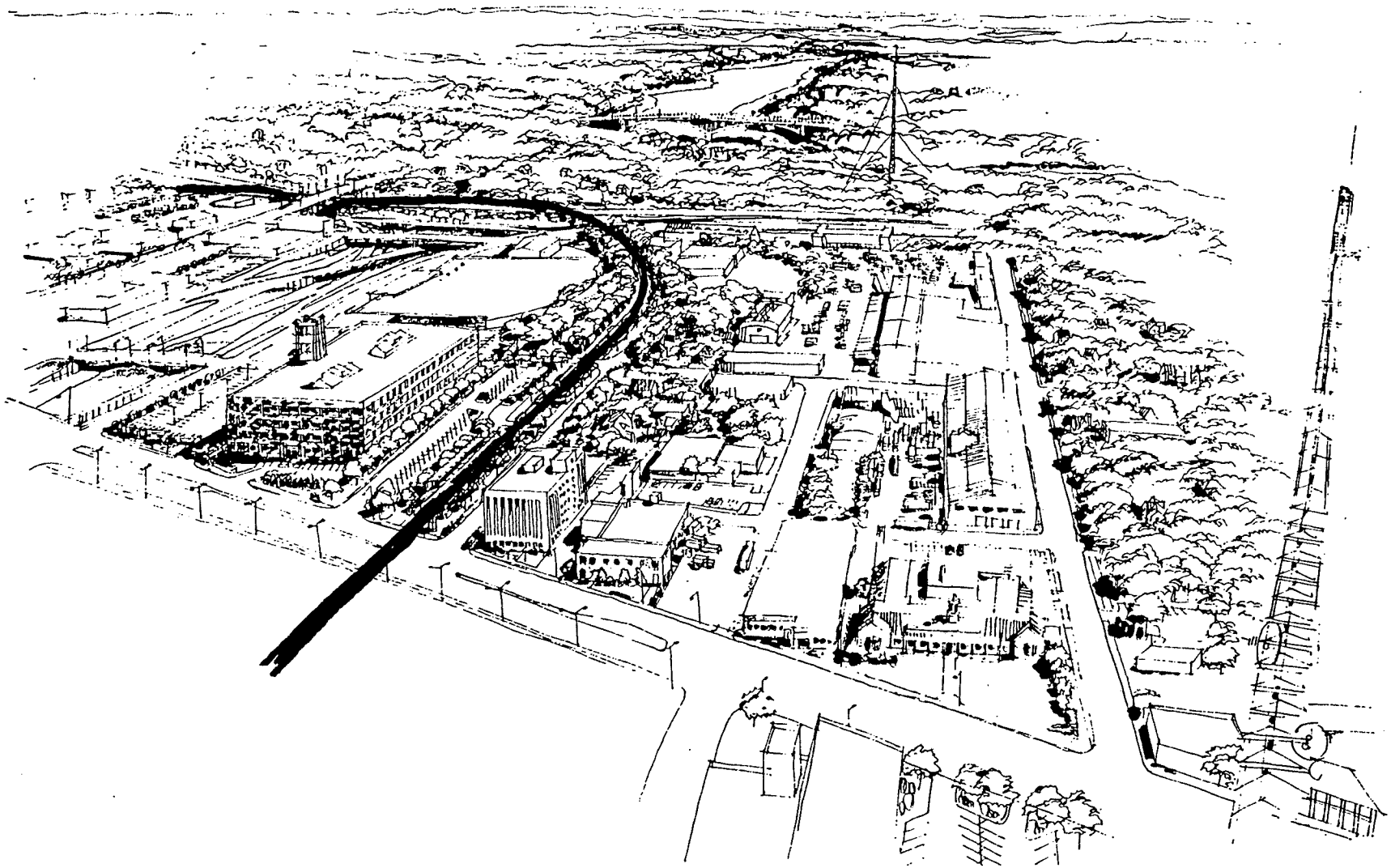
[3]This is from the Metropolitan Council's "Regional Transit Facilities Plan," which was released in 1992. See page 17.

# Appendix 7

The following pages were produced by BRW engineering firm for Ramsey County Regional Railroad Authority. The ten minute (1/2 mile) walking circle around the station contains low, medium, and high density residential areas, significant amounts of Industrial areas and commercial areas. There is a sizable parcel of vacant land on the north side of University Avenue that could be integrated into the station development area. The commercial and industrial areas can be employment centers as well as benefit from redevelopment. The medium to high income area of Prospect Park to the west and the other residential areas surrounding the station will serve as a mixed-income locations for future LRT users.

Included is a map of the "feeder" bus routes that would circulate and deliver passengers to the Westgate Station. Site plans are included. Also included in the next pages is a cross section of I-94, showing a comparison between existing and future alignment.

Appendix 9 is a map of one Central Corridor alignment considered.



Appendix 7.1

**STATION AERIAL PERSPECTIVE**
**WESTGATE STATION**
**I-94 ALIGNMENT**

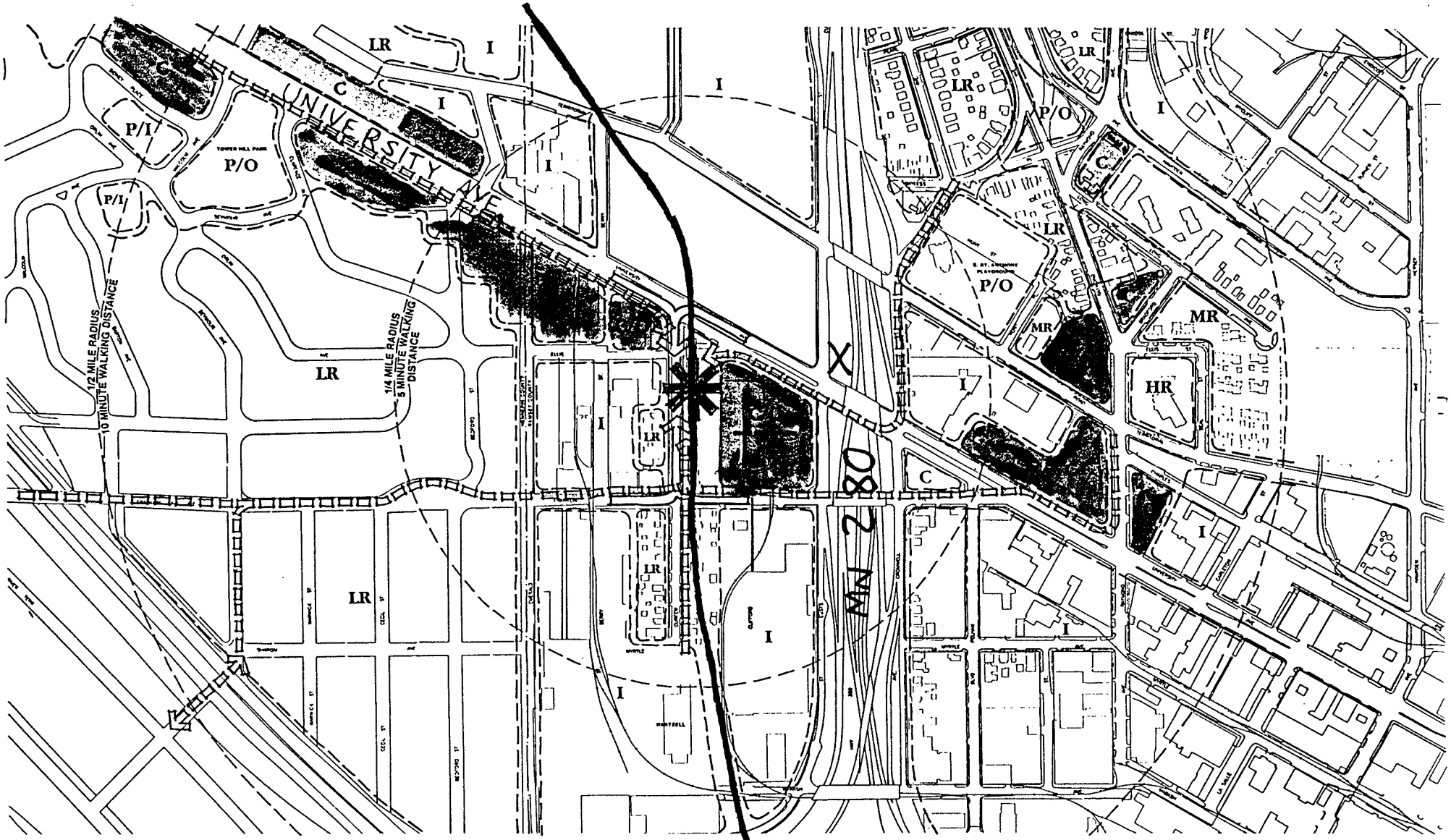
MIDWAY CORRIDOR
Light Rail Transit - Preliminary Design Study
RCRRA/HCRRA
Ramsey County Regional Railroad Authority | Hennepin County Regional Railroad Authority

9/24/92

BRW

Commercial, office, residential

WESTGATE.



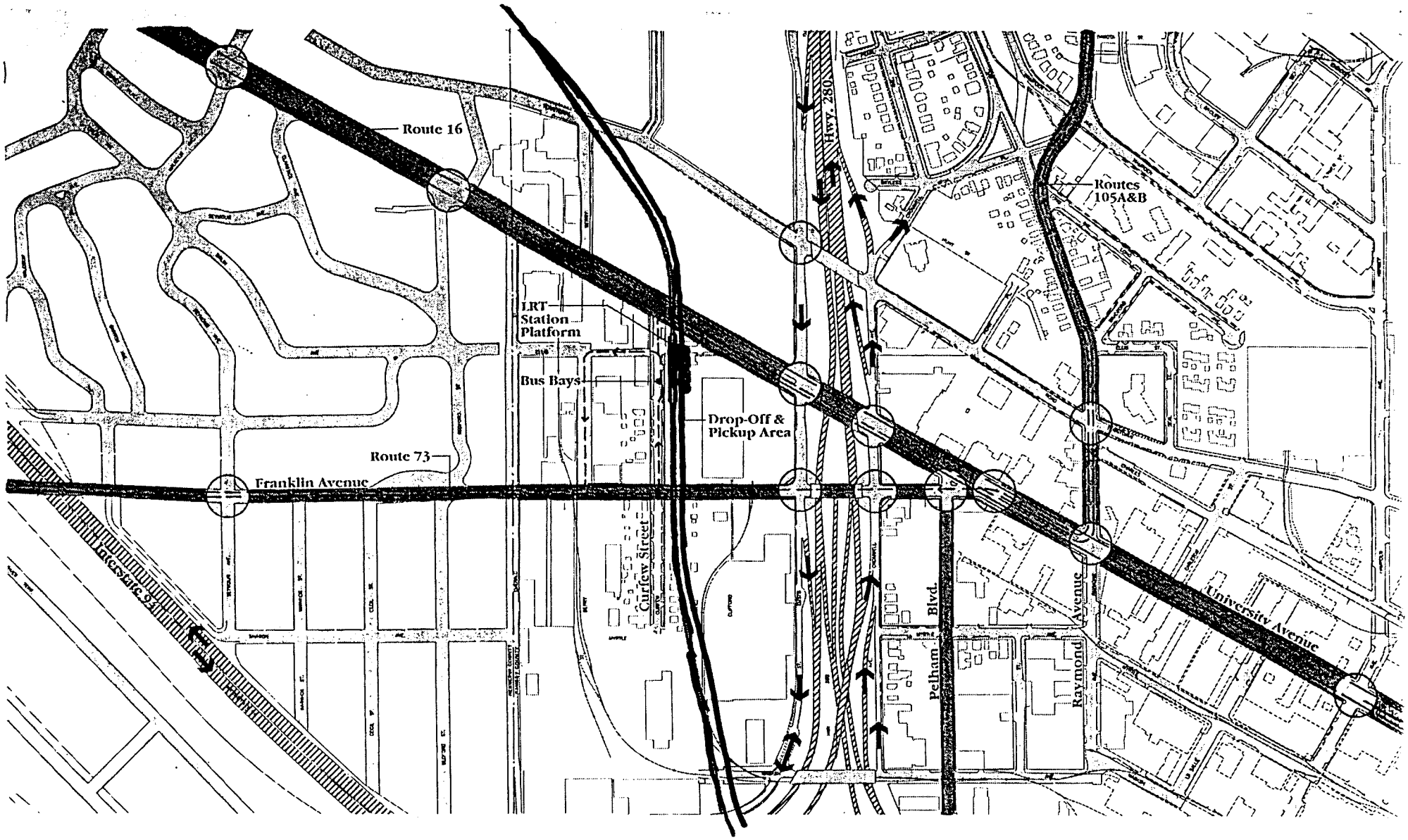

**STATION AREA LAND USE**
**WESTGATE STATION**
I-94 ALIGNMENT

- LR LOW-DENSITY RESIDENTIAL
- MR MED.-DENSITY RESIDENTIAL
- HR HIGH-DENSITY RESIDENTIAL
- COMMERCIAL
- COMMERCIAL/OFFICE
- I INDUSTRIAL
- P/I PUBLIC/INSTITUTIONAL
- P/O PARK/OPEN SPACE
- PEDESTRIAN ACCESS
- VEHICULAR ACCESS
- LRT STATION
- LRT ENVELOPE

MIDWAY CORRIDOR
Light Rail Transit • Preliminary Design Study
RCRRA/HCRRA
Ramsey County Regional Railroad Authority · Hennepin County Regional Railroad Authority

9/24/92
NORTH
0' 200' 400'
BRW

Appendix 7.2



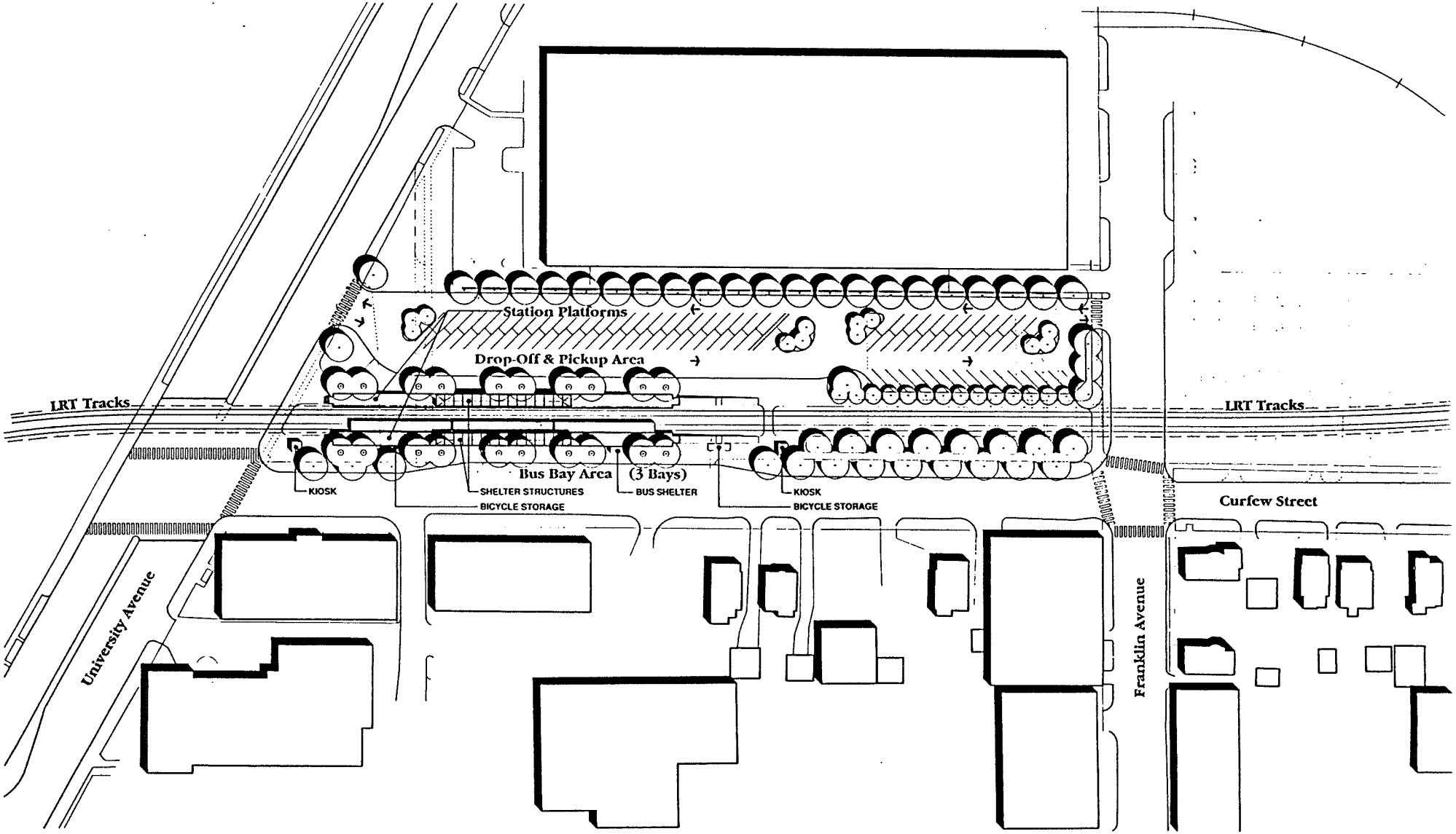

**STATION ACCESS & CIRCULATION PLAN**
**WESTGATE STATION**
**I-94 ALIGNMENT**

- ARTERIAL/COLLECTOR ROADWAY
- LOCAL ROADWAY
- LRT ENVELOPE
- DROP-OFF & PICKUP AREA
- INTERSECTION WITH SIGNALS
- FEEDER BUS ROUTE
- DIRECTION OF TRAFFIC FLOW
- LRT STATION PLATFORM

**MIDWAY CORRIDOR**
Light Rail Transit - Preliminary Design Study
RCRRA/HCRRA
Ramsey County Regional Railroad Authority · Hennepin County Regional Railroad Authority

9/24/92
NORTH
0' 200' 400'
BRW

Appendix 7.3



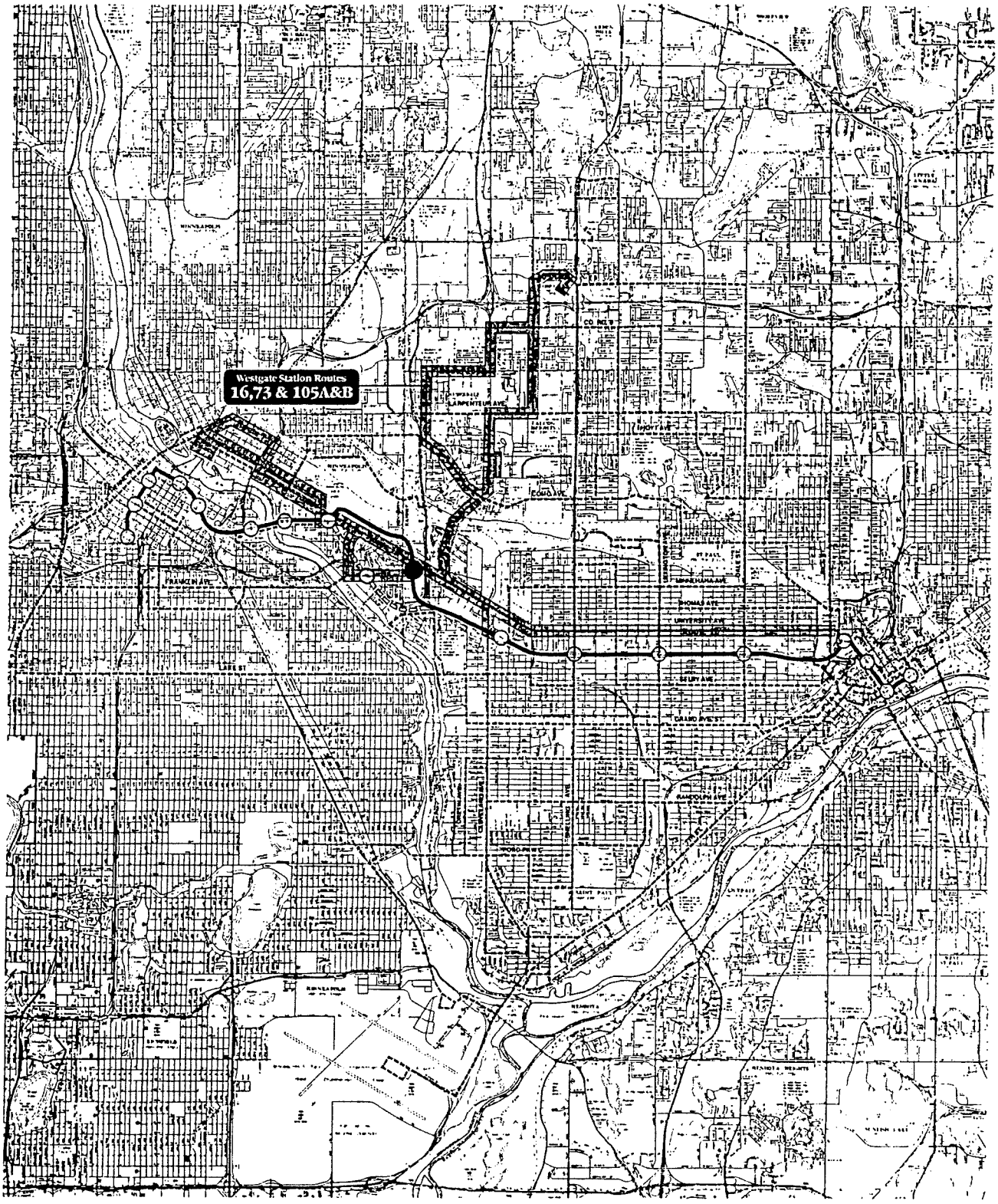

**STATION SITE PLAN**
**WESTGATE STATION**
**I-94 ALIGNMENT**

**MIDWAY CORRIDOR**
Light Rail Transit - Preliminary Design Study
RCRRA/HCRRA
Ramsey County Regional Railroad Authority — Hennepin County Regional Railroad Authority

9/24/92
NORTH
0' 40' 80'
BRW

Appendix 7.4

Appendix 7.5

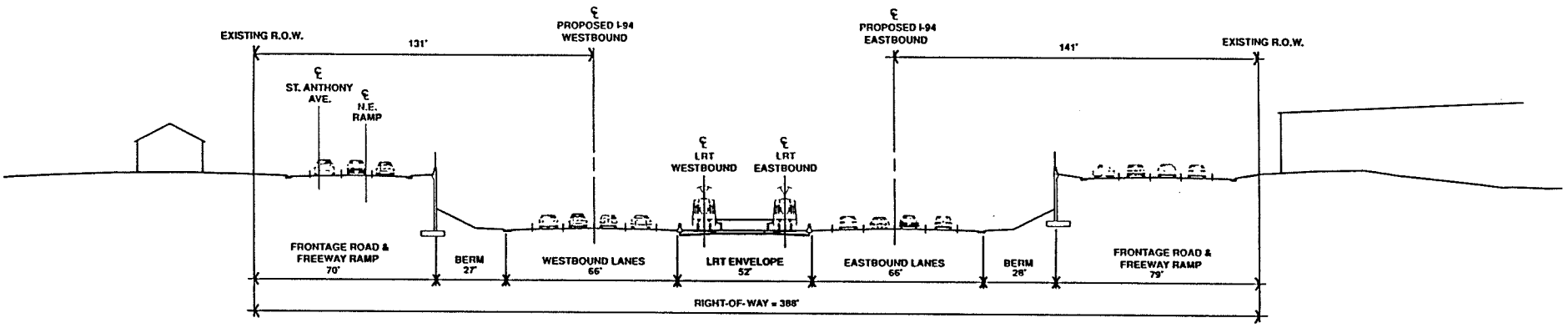



**STATION FEEDER BUS PLAN**
**WESTGATE STATION**
I-94 ALIGNMENT

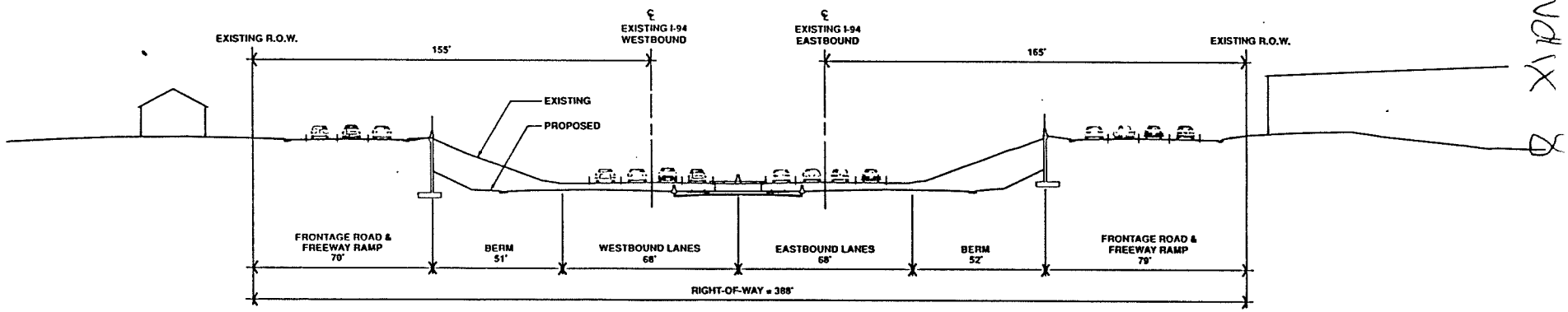
MIDWAY CORRIDOR
Light Rail Transit - Preliminary Design Study
RCRRA/HCRRA

9/24/92

HRW




TYPICAL CROSS-SECTION ALONG I-94
PROPOSED CONDITIONS




TYPICAL CROSS-SECTION ALONG I-94
EXISTING/PROPOSED COMPARISON

Appendix 8

**TYPICAL I-94 CROSS-SECTION**
I-94 ALIGNMENT

Appendix 8

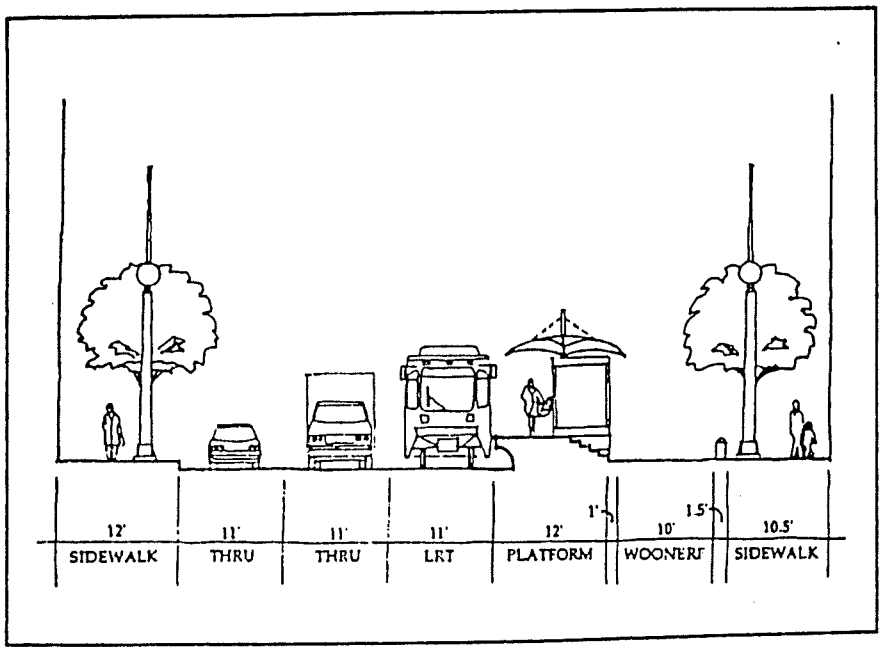
MIDWAY CORRIDOR
Light Rail Transit - Preliminary Design Study
RCRRA/HCRRA

8/12/92

0' 20' 40'

BRW

# Appendix 10




*Downtown LRT Station*

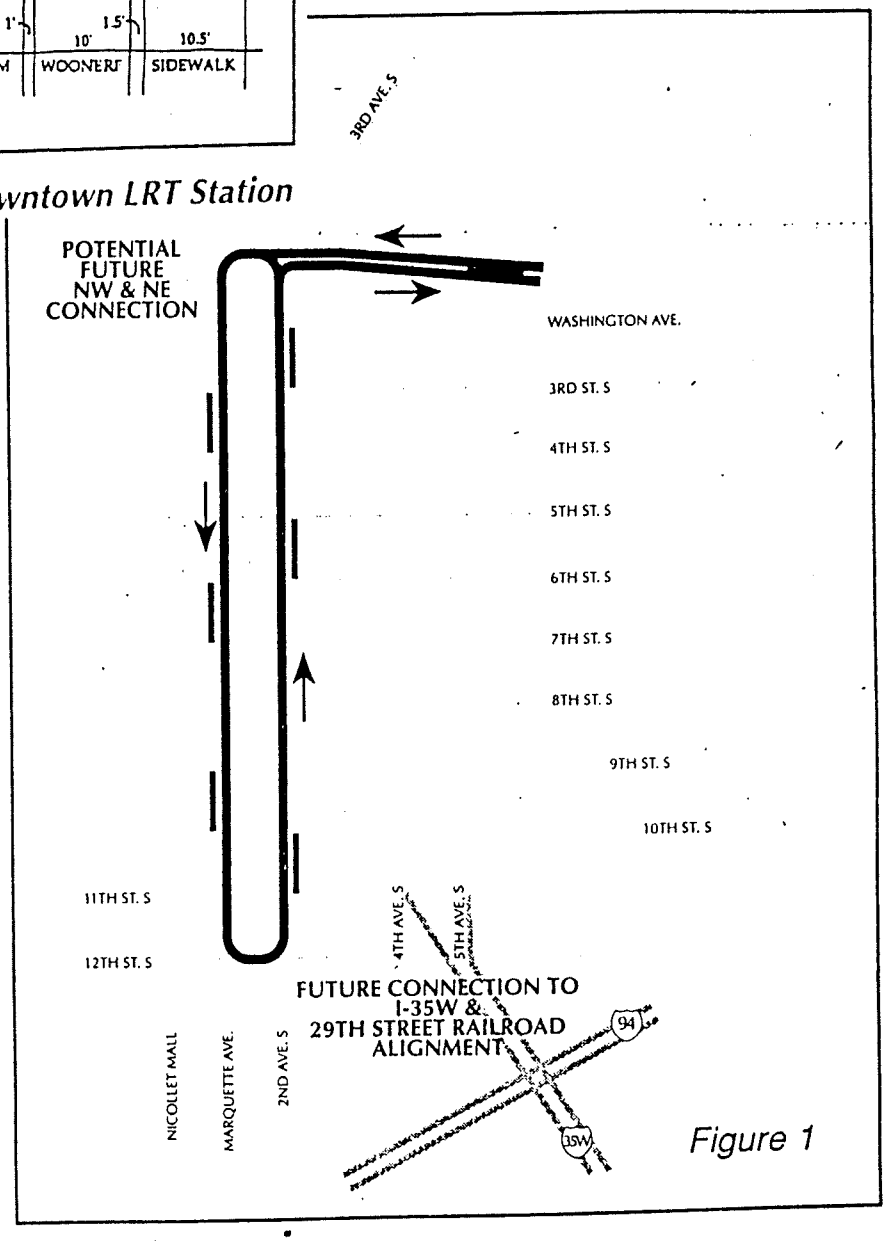



Figure 1

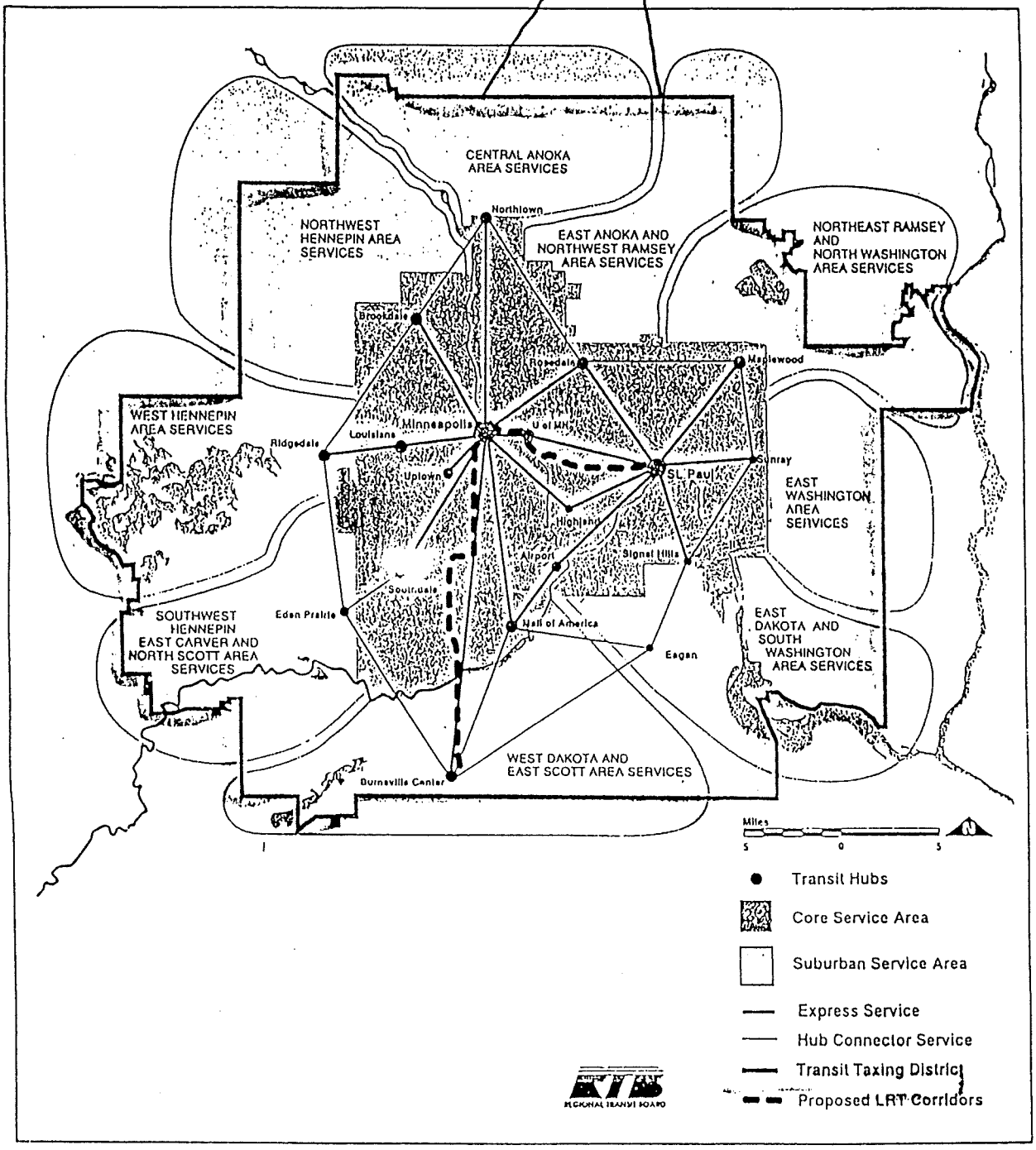
*Downtown Mpls At-Grade Alignment*

Source: Met Council

Appendix II

# TRANSIT TAXING DISTRICT

Figure 3.1 Transit System Reorganization




Source: RTB

Appendix 12.1

# Central Corridor Light Rail Transit Project

**April, 1994**

**STATUS**

PROJECT STATUS -- Region's first priority corridor for light rail transit; in the federally sponsored Alternatives Analysis/Draft Environmental Impact Statement process

ROUTE -- Eleven-mile route running from Union Depot (4th and Sibley) in downtown St. Paul to the Convention Center (12th Street between 2nd and Marquette) in downtown Minneapolis. Located in the median of I-94 between Western and Fairview, along Soo Line tracks to TH 280, and along the University of Minnesota transitway

ACCESS --

Stations: 20 stations serving the following general areas: Downtown St. Paul, State Capitol, Minnesota History Center, St. Paul TVI, Westgate, University of Minnesota, Metrodome, Downtown Minneapolis

Ridership: 33,700 per day in year 2010

Bus service modifications: LRT will replace existing bus service in the corridor and will be integrated with improved bus service for the region

COSTS --

Capital costs: $474,000,000 including costs of $219,000,000 for facilities beneficial to future system expansion

Operating costs: $68 million per year for bus and LRT for the corridor

Funding: 50% or more of the capital costs are anticipated to be provided by the federal government if we take advantage of current laws and congressional support. State funds (gas tax, motor vehicle excise tax, sales tax) would be sought to provide the remainder

OPERATING PLAN --

Number of vehicles: 23

Vehicle capacity: 75 seats, 90 standees, up to 3 vehicles per train

Fare: consistent with bus fares

Travel time: downtown to downtown 29 minutes; downtown Minneapolis to University of Minnesota 8 minutes; downtown St. Paul to University of Minnesota 21.5 minutes

Maximum speed: 55 miles per hour

Frequency: 7 minutes peak and midday; 15 minutes at night. 20 hours per day operation, 365 days a year in all weather conditions

Power source: Electrical wires overhead

Opening date: Depending on funding, construction could begin in 1996, with opening in 1999

Central Corridor Light Rail Transit Project

Appendix 12.2 April, 1994

BENEFITS

JOBS -- The American Public Transit Association estimates that each $10 million capital investment in transit generates 770 jobs.

ECONOMIC DEVELOPMENT -- Buffalo attributes $200 million in development commitments to LRT following its first year of construction.

-- Lease values in San Diego downtown increased $10 per square foot after LRT.

-- Portland has had 69 development projects worth $1 billion immediately adjacent to LRT since 1987.

-- Commercial land values commonly increase 100-300 percent around rail stations, according to the Rice Center Research Institute.

-- The Metropolitan Council indicates it is reasonable to assume that 10 percent of the region's projected growth over 20 years could be channeled around LRT stations in the 35W and Central Corridors. That means 30,000 additional jobs and 23,000 new households. Lease rates of commercial buildings near rail station areas can be expected to increase up to 25 percent following construction of LRT.

TRANSIT USE -- St. Louis' LRT system opened in July, 1993. Patronage estimates have been exceeded by one third, and overall bus, rail, and para-transit use has increased 23% over a year ago.

Although metropolitan LRT patronage forecasts are conservative, and cannot take into account the preference of patrons for LRT, attitudinal research shows that LRT is more attractive to prospective users than buses.

An investment in LRT is an investment in better bus service for the region. Additional bus service will complement LRT, getting people to jobs.

Development in downtowns is concentrated, making it convenient and effective to serve by transit, unlike suburban development. The concentration of employment will continue in downtowns, even though the number of jobs in the suburbs is growing. The Central Corridor connects both downtowns and the University of Minnesota, the three major transit generators in the region.

INFRASTRUCTURE -- LRT will rebuild I-94 for three miles with new landscaping and will rebuild Cedar and Fourth Streets in downtown St. Paul curb to curb with attractively landscaped streetscapes. Downtown Minneapolis and the University of Minnesota will also benefit from LRT's introduction there.

REGIONAL AND CENTER CITY HEALTH -- The 11-mile long Central LRT Corridor focuses reinvestment where it is needed. The strength of the region as a whole depends on the vitality of its parts. The Central Corridor contains nearly 150,000 residents, 1/4 of the center cities' population. Thirty percent of its households are without access to autos. Forty-five percent live in low-income (22%) or poverty level households (23%).

CONGESTION -- The number of trips on regional transportation systems is increasing at 4% per year. Auto occupancy rates have fallen to 1.12. The number of miles of congested freeways has tripled in the last decade. Transit use over the last 10 years has fallen, despite efforts to encourage bus and car-pooling use. The Texas Transportation Institute estimates that congestion costs the Twin Cities region $360 million per year.