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# Final Summary Report Executive Summary

## Twin Cities Metropolitan Commuter Rail Feasibility Study

### Phase II

*January 1999*

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**PARSONS  
BRINCKERHOFF**





Minnesota Department of Transportation

Transportation Building

395 John Ireland Boulevard  
Saint Paul, Minnesota 55155-1899

January 26, 1999

The Honorable Carol Flynn, Chair  
Senate Transportation Committee  
120 Capitol  
75 Constitution Avenue  
St. Paul, MN 55155

The Honorable Tom Workman, Chair  
House Transportation Committee  
355 State Office Building  
St. Paul, MN 55155

RE: Twin Cities Commuter Rail Feasibility Study - Phase II

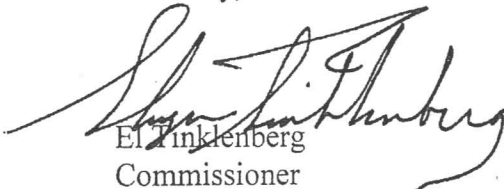
Dear Senator Flynn and Representative Workman

Minnesota Laws 1997, Chapter 159, Article 2, Section 51 directed that the Minnesota Department of Transportation conduct a Twin Cities Commuter Rail Feasibility Study and that Phase II of the study be completed and reported to the Legislature by February 1, 1999. I am pleased to provide copies of the Phase II study, full report and executive summary, titled "Final Summary Report of the Twin Cities Commuter Rail Feasibility Study - Phase II" for transportation committee members review and consideration.

My personal review of the Phase II study has resulted in one modification to the study implementation strategy which is being communicated through this letter. It is my determination that the implementation strategy be revised to extend Line B, Tier One (1), Stage One (1), to Elk River rather than truncating the line at Ramsey as the report suggests. My reasoning for this modification is that the City of Elk River with two major highway accesses, T.H. 169 & T.H. 10, provides a more logical end terminal for this route. Incorporating this revision will result in an increased capital cost estimate of approximately \$28 million for the Tier One (1) system.

Mn/DOT is pleased to have had the opportunity to conduct this study and is prepared to share the study results with appropriate legislative committees at your request.

Sincerely,

  
Elvinklenberg  
Commissioner

**Section I – Executive Summary**

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## A. Introduction

During the 1997 Minnesota legislative session, the Legislature instructed the Minnesota Department of Transportation (Mn/DOT) to conduct a feasibility study to determine if selected freight railroad corridors throughout the Twin Cities metropolitan area could support commuter rail service in a cost-effective manner. The Twin Cities Metropolitan Commuter Rail Study was undertaken during the Fall of 1997 as a response to this directive.



MetroLink – Double-Deck, Diesel-Hauled Cars

*“Mn/DOT worked closely  
with community leaders”*

Mn/DOT worked closely with community leaders at the state and local levels to ensure that the study was conducted in a fair, objective and open manner. Prior to the conduct of the study, Mn/DOT established a Steering

*“Mn/DOT established a Steering and an Advisory Committee”*

and an Advisory Committee to receive, review and comment on the study progress results. The membership of each committee was designed to provide geographic and potential stakeholder balance to the study process.

The Final Summary Report summarizes the conduct, methodology employed, and findings obtained during the course of the Twin Cities Metropolitan Rail Commuter Study.

## **B. Purpose and Need**

*“By the year 2020, the Twin Cities metropolitan area will grow by 650,000 people”*

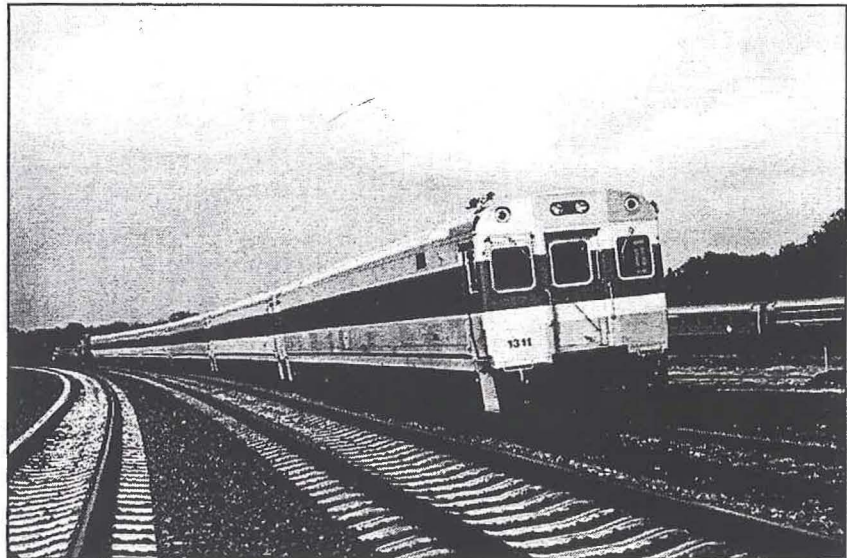
The Metropolitan Council predicts that by the year 2020, the Twin Cities metropolitan area will grow by 650,000 people and 330,000 households, adding 2.4 million daily automobile trips to the region’s highway system.

Reasons for studying transportation alternatives such as commuter rail included the following:

- Increased congestion on the Metropolitan Highway System, as well as supporting arterial roadways and local streets,
- Increased costs of building and maintaining roadway infrastructure,
- Population and employment growth in the metropolitan area,
- Responsible utilization of natural resources, and
- Support for the development and maintenance of livable communities.

**C. Evaluation  
Methodology  
and Results**

The study was conducted in two phases in order to allow the state legislature the opportunity to review the study process, methodology and results. Evaluation methodology and findings were also reviewed by Mn/DOT and Steering and Advisory Committees throughout the duration of the study.



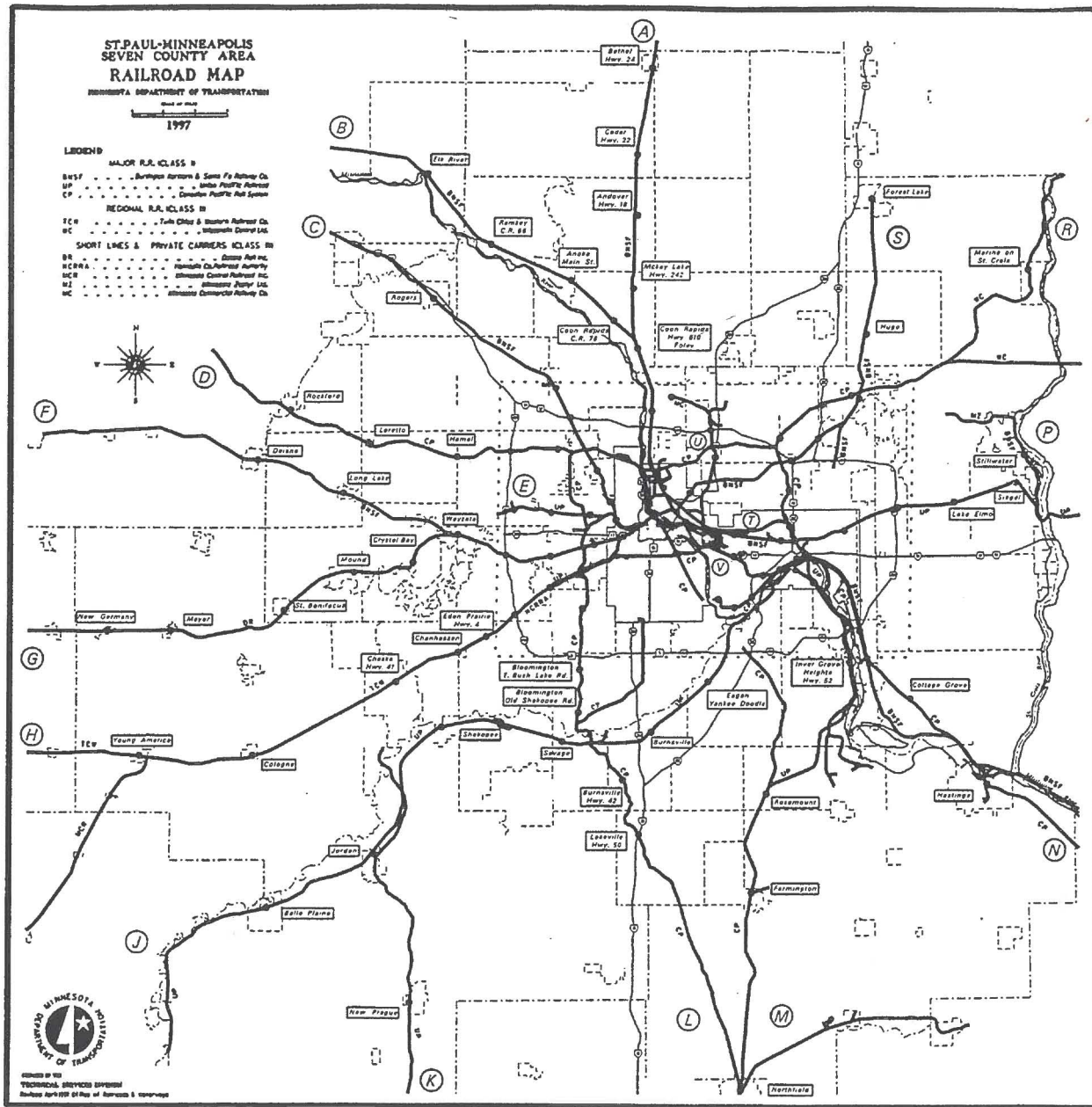
Diesel Hauled Consist with Control Coach

*"19 existing freight railroad  
lines were evaluated"*

**1. Phase I Evaluation and Results**

During Phase I, 19 existing freight railroad lines throughout the Twin Cities metropolitan area were evaluated with regard to their ability to support commuter rail service in a cost-effective manner (refer to Figure 1-1). In February of 1998, Mn/DOT presented the results of the Phase I analysis to the House and Senate Transportation Committees. The results indicated that out of the existing 19 freight corridors under consideration, six corridors had

Figure 1-1  
Existing Freight Railroad Lines



higher potential to support commuter rail service in a cost-effective manner. These corridors or routes, listed below, were then advanced to Phase II for more detailed analysis (refer to Figure 1-2):

- Bethel - Minneapolis - St. Paul (Route A),
- Elk River - Minneapolis - St. Paul (Route B),
- Northfield - Minneapolis - St. Paul (Route L),
- Hastings - St. Paul - Minneapolis (Route N),
- Forest Lake - St. Paul - Minneapolis (Route S), and
- Minneapolis - St. Paul connector route (Route T).

*“Routes were evaluated on the basis of ridership, costs and various measures of cost-effectiveness”*

Routes were evaluated on the basis of estimated ridership, capital and operations and maintenance costs and various measures of cost-effectiveness such as cost per passenger-mile and passengers per route-mile. Also taken into consideration were perceived opportunities and barriers to implementation. For example, land use and environmental impacts, highway grade crossing impacts and the number of existing freight rail carriers effected were considered. A summary tabulation of the data used to arrive at the Phase I results is presented in Table 1-1.

Route T was advanced to Phase II based on the need to provide a direct connection between the Minneapolis and St. Paul CBDs. The House Transportation Committee decided to add the Young America - Minneapolis - St.



Figure 1-2  
Phase II Systems Map

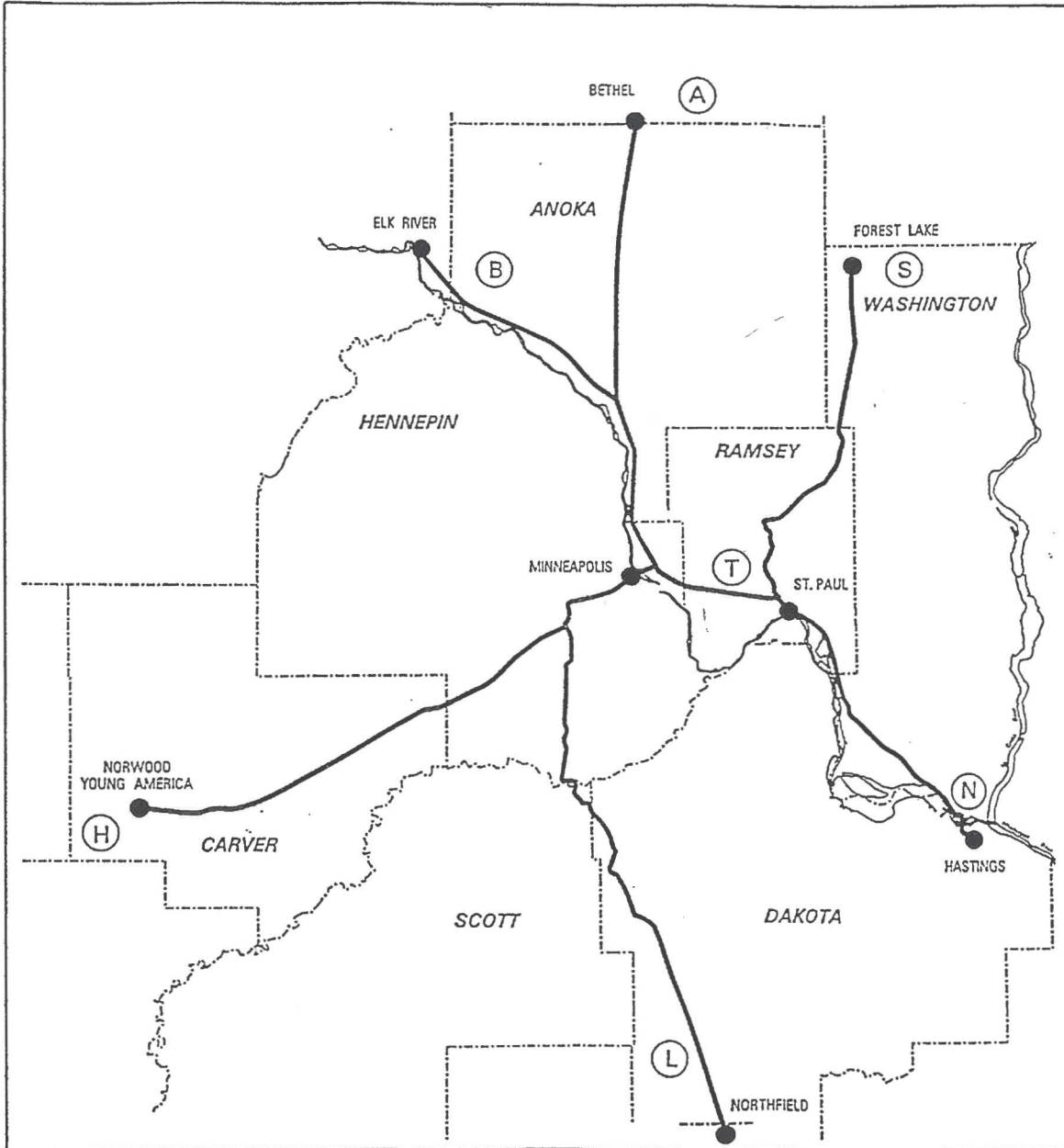


Table 1-1  
Phase I Route Evaluation Matrix

Route Characteristics:	A Bethel/ Anoka County	B Elk River/ Anoka County	C Rogers/ Hennepin County	D Rockford/ Hennepin County	E Plymouth/ Hennepin County	F Maple Plain/ Hennepin County	G New Germany/ Carver County
• Owners/Operators	BNSF	BNSF	BNSF	CP/BNSF	UP/CP/BNSF	BNSF	DR/BNSF
• Length	39.4	42.3	31.4	40.0	20.1	40.1	49.3
• Travel Time	93 min.	102 min.	72 min.	94 min.	49 min.	94 min.	108 min.
• Number of Stations	6	6	5	7	3	6	8
<b>Evaluation Criteria:</b>							
<b>Operational Issues</b>							
• Number of Road Crossings	33	25	39	39	28	15	66
• Capacity Constraints	Northtown Yd.	Northtown Yd.	---	---	---	---	---
<b>Perceived Benefits</b>							
• Ridership (2005)	2,014	2,150	790	775	398	934	1,297
• Passenger-Miles	33,612	34,616	10,779	8,831	4,965	13,367	22,314
<b>Impacts and Costs</b>							
• Environmental Impacts	---	---	---	New Conn. at Crys.Jct.	---	---	---
• Capital Cost (2003,\$M)	\$165.2	\$173.0	\$139.8	\$210.6	\$112.0	\$170.3	\$203.8
• Annual O&M Cost (\$M/yr)	\$6.574	\$7.057	\$5.239	\$6.674	\$3.354	\$6.690	\$8.225
<b>Comparative Data</b>							
• Cost/Passenger-Mile	\$1.18	\$1.22	\$2.98	\$4.93	\$4.51	\$3.02	\$2.21



Section I  
Executive Summary

Table 1-1 (Continued)  
Phase I Route Evaluation Matrix

Route Characteristics:	H Young America/ Carver County	J Belle Plaine/ Scott County	K New Prague/ Scott County	L Northfield/ Scott County	M Farmington/ Dakota County	N Hastings/ Dakota County
<ul style="list-style-type: none"> <li>• Owners/Operators</li> <li>• Length</li> <li>• Travel Time</li> <li>• Number of Stations</li> </ul>	TCW/CP/BNSF 49.5 114 min. 8	UP/CP 57.8 124 min. 7	UP/CP 60.8 128 min. 7	CP/BNSF 58.2 129 min. 7	CP/UP/CP 48.1 102 min. 4	BNSF/CP 29.9 71 min. 10
<b>Evaluation Criteria:</b>						
<b>Operational Issues</b>						
<ul style="list-style-type: none"> <li>• Number of Road Crossings</li> <li>• Capacity Constraints</li> </ul>	41	77	104	58	46	27
<b>Perceived Benefits</b>						
<ul style="list-style-type: none"> <li>• Ridership (2005)</li> <li>• Passenger-Miles</li> </ul>	1395 21,797	1691 23,943	1719 24,934	2462 39,243	1155 18,534	1179 15,991
<b>Impacts and Costs</b>						
<ul style="list-style-type: none"> <li>• Environmental Impacts</li> <li>• Capital Cost (2003, \$M)</li> <li>• Annual O&amp;M Cost (\$M/yr)</li> </ul>	St. L. Pk./ Superfund \$228.0 \$8.259	--- \$227.4 \$9.644	--- \$240.6 \$10.144	--- \$149.6 \$8.025	--- \$138.8 \$4.989	New Constr. \$162.9 \$5.089
<b>Comparative Data</b>						
<ul style="list-style-type: none"> <li>• Cost/Passenger-Mile</li> </ul>	\$2.36	\$2.37	\$2.40	\$1.42	\$2.38	\$1.73

Table 1-1 (Continued)  
Phase I Route Evaluation Matrix

Route Characteristics:	P Stillwater/ Washington County	R Marine on St. Croix/ Washington County	S Forest Lake/ Washington County	T ---	U Fridley/ Anoka County	V ---
• Owners/Operators	UP/New/BNSF/CP	WC/CP/BNSF/CP	New/BNSF/CP	BNSF/CP	MNRR/BNSF/New	BNSF/MNRR/CP
• Length	30.5	41.0	36.3	9.9	22.1	11.5
• Travel Time	73 min.	95 min.	88 min.	23 min.	63 min.	30 min.
• Number of Stations	4	5	6	4	3	6
<b>Evaluation Criteria:</b>						
<b>Operational Issues</b>						
• Number of Road Crossings	40	45	34	3	36	7
• Capacity Constraints	---	---	---	Hennepin Av./I35W	---	Hennepin/I35W
<b>Perceived Benefits</b>						
• Ridership (2005)	1,099	897	1273	227	376	352
• Passenger-Miles	15,991	11,356	19,163	3,071	3,629	3,038
<b>Impacts and Costs</b>						
• Environmental Impacts	New Constr.	---	New Conn at I/I Canada Jct.	---	New Constr.	---
• Capital Cost (2003,\$M)	\$162.9	\$153.1	\$172.6	\$56.5	\$165.4	\$80.9
• Annual O&M Cost (\$M/yr)	\$5,089	\$6,841	\$6,056	\$3,570	\$3,687	\$3,570
<b>Comparative Data</b>						
• Cost/Passenger-Mile	\$2.09	\$1.98	\$9.08	\$7.71	\$6.83	

Notes:

1. Route length is the distance from the outermost station to the nearest CBD.
2. Travel time estimates assume the provision of local ("all stop") service. Although not reflected in the table, commuter rail travel times should be expected to decrease as the system matures due to the eventual implementation of "skip-stop" or express services.
3. Capital costs include all rolling stock and all massive equipment, systems and facilities including stations, as well as escalation (year 2003) and contingency.



Paul route (Route H) to the list of routes to be included in the detailed Phase II evaluation.

## 2. Phase II Evaluation and Results

The purpose of the Phase II analysis was to “fine-tune” ridership and cost estimates, suggest the appropriate technology to be used and determine the economic, environmental, social and financial effects of commuter rail service on each of the seven routes described above. In addition, an implementation strategy that outlines potential hours of operation, fares and project construction staging was also developed. A summary tabulation of the data used to arrive at the Phase II results is presented in Table 1-2.

*“Mn/DOT and the Committees agreed that commuter rail service, if implemented should be staged”*

After extensive review and discussion of this data, Mn/DOT and the Steering and Advisory Committees agreed that commuter rail service, if implemented should be staged in order to reduce initial capital expenditures and allow time for the evaluation of the performance of routes initially implemented. With this in mind, Mn/DOT and the committees recommended the following route staging sequence (refer to Figure 1-3):

- Stage One - Ramsey - Minneapolis - St. Paul (truncated Route B),
- Stage Two - Hastings - St. Paul - Minneapolis (Route N), and

Table 1-2  
PHASE II EVALUATION MATRIX

ROUTE CHARACTERISTICS:	A Bethel/ Anoka County	B Elk River/ Anoka County	H Young America/ Carver County	L Northfield/ Rice County	N Hastings/ Dakota County	S Forest Lake/ Wash. County	T Minneapolis/ St. Paul
<ul style="list-style-type: none"> <li>• Owners/ Operators</li> <li>• Length</li> <li>• Travel Time</li> <li>• Number of Stations</li> </ul>	BNSF 28.8 miles 54 minutes 7	BNSF 30.1 miles 50 minutes 7	TC&W, CP, BNSF 38.0 miles 62 minutes 9	CP, BNSF 48.3 miles 75 minutes 9	BNSF, CP 18.4 miles 29 minutes 3	BNSF, CP, BNSF, CP 24.8 miles 44 minutes 7	BNSF, CP 10.4 miles 24 minutes 4
<b>EVALUATION CRITERIA:</b>							
<b>Operational Issues</b>	33	25	49	61	27	37	3
<ul style="list-style-type: none"> <li>• Number of Road Crossings</li> <li>• Freight Utilization</li> <li>• Capacity Constraints</li> </ul>	Significant Northtown Yard	Significant Northtown Yard	Low None	Low None	Significant None	Moderate None	Significant Numerous
<b>Perceived Benefits</b>	2,300 daily 38,100 daily Moderate	3,400 daily 54,300 daily Significant	2,900 daily 34,600 daily Significant	4,700 daily 84,900 daily Significant	2,300 daily 29,300 daily Moderate	2,700 daily 34,400 daily Significant	(Included in other Routes) Significant
<ul style="list-style-type: none"> <li>• Ridership (2005)</li> <li>• Passenger-Miles</li> <li>• Station-Area Land Use Potential</li> </ul>							
<b>Impacts and Costs</b>							
<ul style="list-style-type: none"> <li>• Environmental Impacts</li> <li>• Capital Cost (2003)</li> <li>• Annual O&amp;M Cost</li> </ul>	Minimal \$224 million \$6.5 million	Minimal \$198 million \$8.5 million	Haz-Mat Remediation \$252 million \$8.2 million	River Crossing \$347 million \$14.6 million	Wetlands \$158 million \$4.7 million	Social - Property Acquisition \$185 million \$5.9 million	Social - Property Acquisition (Costs Included in other Routes)
<b>Comparative Data</b>	0.14 (\$192 million) (1.18)	0.26 (\$153 million) (1.06)	0.16 (\$214 million) (1.17)	0.22 (\$267 million) (1.06)	0.16 (\$133 million) (1.16)	0.13 (\$173 million) (1.18)	(Included in other Routes)
1. Benefit/Cost Ratio							
2. Net Present Value							
3. Net Present Value/ Dollar Invested	4.7	1.3	4.0	3.3	2.7	5.0	
4. Cost-Effectiveness Index	\$15.30	\$9.09	\$12.78	\$10.44	\$10.44	\$10.59	
Average Rank 1 - 3	5.0	1.0	4.3	3.3	2.5	4.8	
5. Cost/Passenger-Mile	\$1.15	\$0.92	\$1.53	\$1.01	\$1.07	\$1.12	

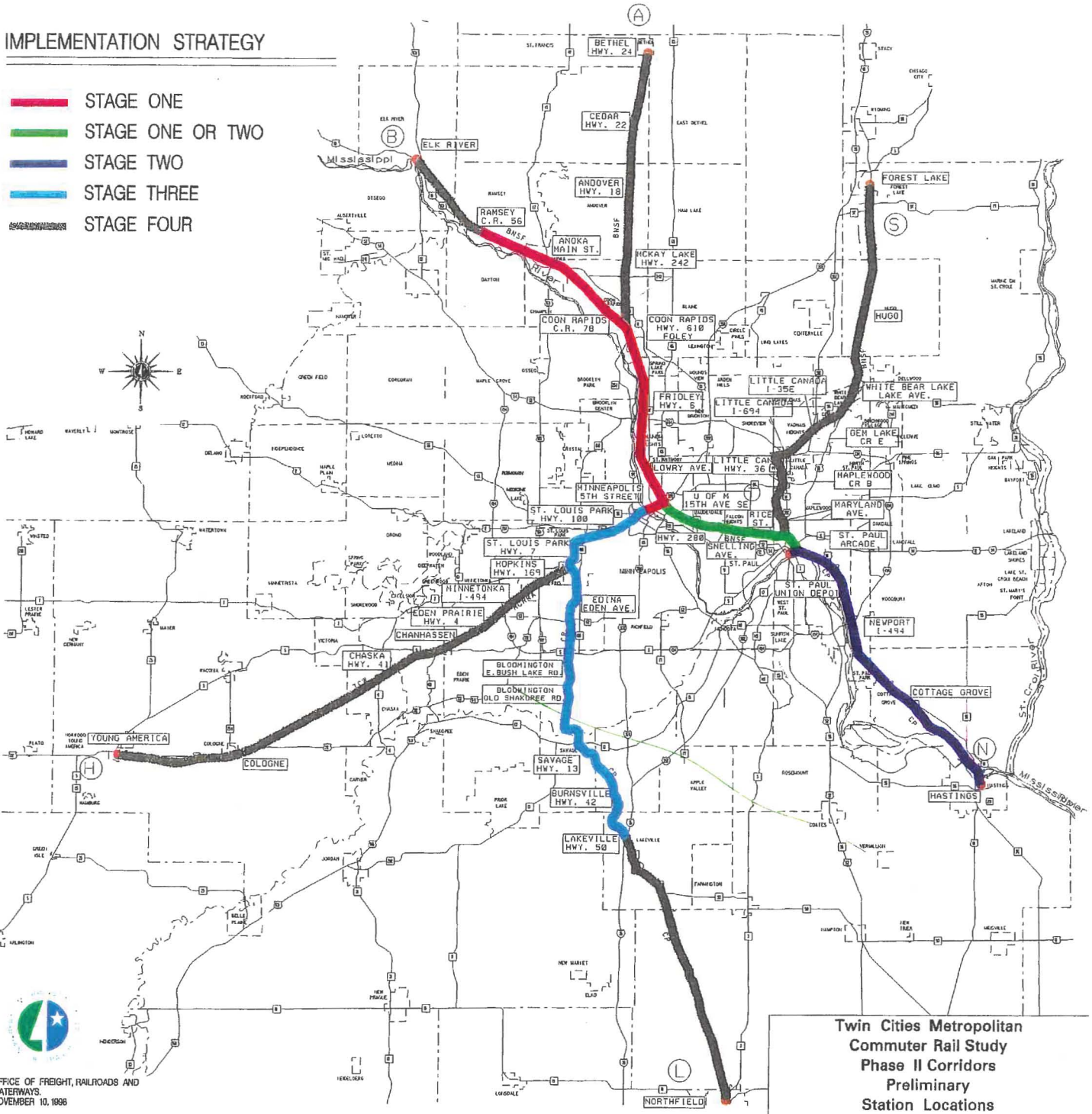
November 5, 1998



Figure 1-3  
Phase II Corridors Preliminary Station Locations

IMPLEMENTATION STRATEGY

- █ STAGE ONE
- █ STAGE ONE OR TWO
- █ STAGE TWO
- █ STAGE THREE
- █ STAGE FOUR



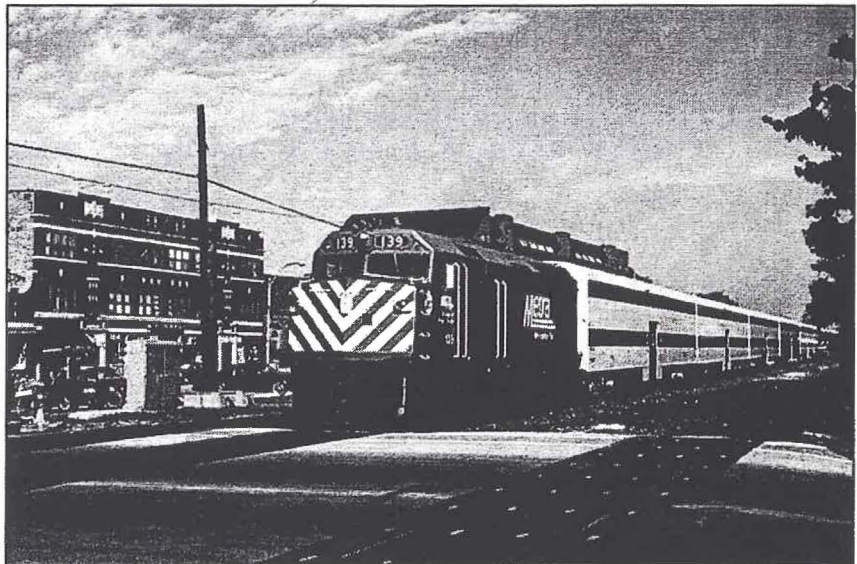
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NOVEMBER 10, 1998

Twin Cities Metropolitan  
Commuter Rail Study  
Phase II Corridors  
Preliminary  
Station Locations



- Stage Three - Lakeville - Minneapolis - St. Paul (truncated Route L).

Truncated versions of Routes B and L were included in this "First Tier" staging recommendation in order to reduce capital and operating costs by initially omitting the least productive portions of these routes.



Metra – Diesel Hauled, Gallery-Type Cars

*"Route T could be a component of either the first or second stage"*

Route T could be a component of either the first or second stage, the costs for which are presented in Table 1-3 as Option I and Option II, respectively. Yearly payments for both the capital program and annual public funding of operations (after fare revenues) are shown separately in the material following Table 1-3 for each of the three proposed stages of First Tier development.



**Table 1-3  
First Tier Staging Summary**

**Option I**

Stage and Destination	Total Capital Cost	Annual Operating & Maintenance Cost (Net)	Total Annualized Capital Cost And Operating & Maintenance Cost	Ridership (2005)
Stage One Routes B and T (Ramsey to Minneapolis to St. Paul)	\$231 Million	\$4.7 Million	\$25.2 Million	3,300
Stage Two Route N (Hastings to St. Paul)	\$163 Million	\$3.4 Million	\$17.8 Million	2,300
Stage Three Route L (Lakeville to Minneapolis)	\$261 Million	\$7.7 Million	\$30.8 Million	4,600
<b>Total</b>	<b>\$655 Million</b>	<b>\$15.8 Million</b>	<b>\$73.8 Million</b>	<b>10,200</b>

**Option II**

Stage and Destination	Total Capital Cost	Annual Operating & Maintenance Cost (Net)	Total Annualized Capital Cost And Operating & Maintenance Cost	Ridership (2005)
Stage One Route B (Ramsey to Minneapolis)	\$178 Million	\$3.1 Million	\$19.0 Million	2,400
Stage Two Route N & T (Hastings to St. Paul to Minneapolis)	\$216 Million	\$5.0 Million*	\$24.0 Million	3,200**
Stage Three Route L (Lakeville to Minneapolis)	\$261 Million	\$7.7 Million	\$30.8 Million	4,600
<b>Total</b>	<b>\$655 Million</b>	<b>\$15.8 Million</b>	<b>\$73.8 Million</b>	<b>10,200</b>

\*Includes \$1.6 million Route B through operating costs.

\*\*Includes 900 Route B through passengers.

Note: All capital costs are in year 2003 dollars, assumed to be the peak construction year for the initial routes in Phase One. If Stages Two and Three were constructed in later years, their costs would be escalated for inflation.

**Stage One (Option I): Route B running between Minneapolis and Ramsey (23 miles); and Route T running from downtown Minneapolis to downtown Saint Paul (10 miles).**

Annual Debt Service for Capital Program	\$20.5 Million
Annual Public Funding for Operating Expenses	<u>\$ 4.7 Million</u>

Total Annual Cost for Stage One (Option I)	\$25.2 Million
--	----------------

**Stage One (Option II): Route B running between Minneapolis and Ramsey (23 miles):**

Annual Debt Service for Capital Program	\$15.9 Million
Annual Public Funding for Operating Expenses	<u>\$ 3.1 Million</u>

Total Annual Cost for Stage One (Option II)	\$19.0 Million
---	----------------

**Stage Two (Option I): Route N running between Hastings and downtown Saint Paul (18 miles), connecting to Route T to Minneapolis.**

Annual Debt Service for Capital Program	\$ 4.4 Million
Annual Public Funding for Operating Expenses	<u>\$ 3.4 Million</u>

Total Annual Cost for Stage Two (Option I)	\$17.8 Million
--	----------------

**Stage Two (Option II): Route N running between Hastings and downtown Saint Paul (18 miles); and Route T running from downtown Minneapolis to downtown Saint Paul (10 miles).**

Annual Debt Service for Capital Program	\$19.0 Million
Annual Public Funding for Operating Expenses	<u>\$ 5.0 Million</u>

Total Annual Cost for Stage Two (Option II)	\$24.0 Million
---	----------------

Note: The difference between Option I and Option II for Stages One and Two is due to which of those stages includes Route T. The difference in total annual costs between the two options of \$6.2 million is attributable fully to the capital and operating expense components for Route T. In the above tables, Stage One debt service is reduced by \$4.6 million (for the Route T capital program of \$53 million) when Route T is deferred to Stage Two. In addition, Stage One public funding for operations (after fare revenue) decreases by \$1.6 million when Route T is not included. The tables above also reflect the increases in Stage Two costs that result from the inclusion of Route T there. The deferral of Route T from Stage One to Stage Two would also result in a reduction of 900 passengers in Stage One daily ridership.



**Stage Three (Options I and II): Route L running between Lakeville and Minneapolis (31 miles), connecting to Route T to Saint Paul.**

Annual Debt Service for Capital Program	\$23.1 Million
Annual Public Funding for Operating Expenses	<u>\$ 7.7 Million</u>
Total Annual Cost for Stage Three	\$30.8 Million

On a cumulative basis, Option I total annual costs would be \$25 million after Stage One, \$43 million after Stage Two, and \$74 million after Stage Three. For Option II, on a cumulative basis, annual costs would total \$19 million at Stage One, \$43 million at Stage Two, and \$74 million at Stage Three. The difference between the two options is \$6 million of annual public expenditure in Stage One.

*“The legislature could choose to adopt one or more alternate staging or phasing scenarios”*

In making this recommendation Mn/DOT and the committees recognized that the legislature could choose to adopt one or more alternate staging or phasing scenarios based on the data produced during this study or on the basis of other more detailed analyses. Future corridor studies to the extent they are performed, should include the further refinement of engineering data, including costs, together with the performance of operations simulations aimed at a definitive determination of potential capacity constraints due to joint freight and commuter operation.

*“Service on the other First Tier routes could be commenced within about ten years”*

### Timing

It is assumed that passenger service on the initial implementation routes in Stage One begins in the year 2005, consistent with the operating assumptions throughout this study. Service on the other First Tier routes, in Stage Two and Stage Three, could be commenced within about ten years of the opening of Stage One.

### Extensions

After implementation of Stages One, Two and Three for the full First Tier program, consideration would be given to the extension of Route B by 8 miles to Elk River (\$26 million to build) and of Route L by 17 miles to Northfield (\$82 million to build). At the same time, any stations that may have been deferred along Routes B, N or L would also be considered for construction.

### Other Routes

Upon completion of Stages One, Two and Three, and possible extensions of Routes B and L, the other three radial routes -- A from Bethel to Minneapolis, H from Norwood to Minneapolis and S from Forest Lake to Saint Paul -- would be evaluated for subsequent implementation.

## **D. Experience of Others**

Table 1-4 shows the experience of several existing commuter rail operations relative to capital costs, ridership

Table 1-4  
Comparison to Existing and Proposed Commuter Rail Systems

Existing Systems (1)/Lines (4)	Year Opened	Length (in Miles)	Number of Stations	Capital Cost (1999 \$)	Capital Cost per Mile (1999 \$)	Average Daily Ridership in 1998	Riders per Route Mile in 1998	Riders per Station in 1998
North Coaster -- San Diego, California	1995	43	8	\$169 m	\$4 m	4,275	100	535
Tri-Rail -- Miami/Ft Lauderdale/W Palm Beach, Fl.	1989	66	17	\$355 m ROW \$105 m RS&C	\$5 m ROW \$2 m RS&C	8,470	130	500
Virginia Railway Express -- Washington, DC	1992	88	18	\$161 m	\$2 m	6,350	70	350
Trinity Railway Express -- Dallas, Texas	1996	10	3	\$76 m	\$8 m	1,980	200	660
Metra North Central Service (4)	1996	56	14	\$141 m	\$2.5 m	3,520	60	250

Planned System (2)	Year Opening	Length (in Miles)	Number of Stations	Capital Cost (1999 \$)	Capital Cost per Mile (1999 \$)	Average Daily Ridership in 2010	Riders per Route Mile in 2010	Riders per Station in 2010
Seattle Sounder -- Seattle, Washington	1999	40	8	\$270 m	\$7 m	11,800	295	1,475

Northstar Corridor (3)	Year Opening	Length (in Miles)	Number of Stations	Capital Cost (1999 \$)	Capital Cost per Mile (1999 \$)	Average Daily Ridership in 2005/2020	Riders per Route Mile in 2005/2020	Riders per Station in 2005/2020
Minneapolis to East St. Cloud	2003	67	10	\$144 to \$164 m	\$2.1 to \$2.4 m	7,200/8,050	110/120	720/805

Comparison Data for the Proposed Mn/DOT System

Planned System (5)	Year Opening	Length (in Miles)	Number of Stations	Capital Cost (1999 \$)	Capital Cost per Mile (1999 \$)	Average Daily Ridership in 2005	Riders per Route Mile in 2005	Riders per Station in 2005
Mn/DOT - Six Route System	N/A	200	43	\$1,166 m	\$6 m	18,700	100	430

Notes:

- m = Dollars in Millions
- ROW = Right-of-Way
- RS&C = Rolling Stock and Construction

- (1) American Public Transit Association Commuter Rail Transit Ridership Report, Second Quarter, April to June 1998.
- (2) Sound Transit, December 1998, Average Daily Ridership forecasts completed by Sound Transit for the Year 2010.
- (3) BRW, Inc. for Capital Costs and Wilbur Smith Associates for Average Daily Ridership for the Year 2005 and 2020.
- (4) Existing rail line (15.4 miles) and stations (3) used by this new service. Ridership is for period Nov. 1997 through Oct. 1998.
- (5) Mn/DOT Capital Program and Final Reports, 1998 and 1999, respectively.

and other parameters. Also included are the projections for two planned commuter operations.

The information in Table 1-4 indicates that the relative performance and cost-effectiveness of commuter rail service in the Twin Cities metropolitan area be comparable to commuter service provided in several other of the nations' major metropolitan areas.

#### E. Summary of Findings

Following is a system-wide summary of the Phase II results discussed earlier in Section C.2 of this report.

- A "First Tier" program consisting of all or portions of Routes B, L, N and T was determined to initially be the most cost effective commuter rail service network.
- The "First Tier" program would cost approximately \$655 million (year 2003 dollars) and require approximately \$74 million in combined annual capital and operating funding.
- Diesel-hauled coaches with control coaches are viewed to be a more cost-effective technology than other options considered, including Diesel Multiple-Unit (DMU) consists. Use of such rolling stock will ensure that FRA crashworthiness and other safety standards are met.
- Potential environmental and social impacts do not appear to present any insurmountable barriers.

*"Potential environmental and social impacts do not appear to present any insurmountable barriers"*

- Provided that mutually satisfactory agreements can be worked-out with the host railroad(s), the remaining operational and institutional issues inherent in providing commuter rail service appear manageable.
- Decisions related to governance, ownership and a host of related operating issues await further analysis and discussion.
- The introduction of commuter rail service is predicted to reduce year 2020 peak hour traffic volumes on major roadways adjacent to each rail corridor by 2% to 7%. Consequently, commuter rail is more likely to serve as a reliable public transportation alternative to automobile travel than as a significant means of relieving congestion on the Metropolitan Highway System.

*“Fixed-guideway transit can provide a powerful growth management tool”*

During the course of the study, Mn/DOT and the study committees recognized that if supportive zoning, development and land-use policies are developed, implemented and enforced, fixed-guideway transit such as commuter rail would be more effective as a transportation alternative.

Regardless of the initial ridership projected or realized on particular routes or lines, the implementation of commuter rail service would ensure that adequate capacity would be in-place to accommodate future travel demand should public development guidelines and private investment

opportunities provide more homes and work places with commuter rail access.

The results of this study require further refinement prior to advancing the implementation of commuter rail service throughout the Twin Cities metropolitan area. However, regardless of the amount of future analysis undertaken, such a commitment ultimately amounts to a policy decision as to where and when to invest the region's limited though substantial monetary resources.

#### F. Next Steps

The potential implementation of commuter rail service in the Twin Cities Metropolitan Area will likely involve the performance of some combination of the following post-feasibility analyses, particularly if a conventional design/bid/build approach to project implementation is envisioned and/or Federal funding is sought for the design and/or construction of the envisioned system:

##### Alternatives Analyses/Corridor Studies

Formerly referred to as Major Investment Studies (MISs), these multi-modal analyses would likely be conducted on a route-specific basis and should include the further refinement of engineering data, including costs, together with the performance of operations simulations aimed at a definitive determination of potential capacity constraints due to joint freight and commuter operation as well as the



resultant capital program required to address such constraints.

If performed simultaneously, such studies could be completed within a twelve to eighteen-month timeframe, depending largely on the extent of the engineering work performed.

#### Preliminary Engineering

Preliminary Engineering is typically a 30% level of design development undertaken to advance the design work to a level sufficient to obtain Federal authorization to proceed with Final Design. The amount of time required to complete Preliminary Engineering depends on many factors, but should also be expected to consume twelve to eighteen months after the completion of Alternatives Analyses/Corridor Studies.

#### Final Design

As the name implies Final Design is an effort undertaken to complete or finalize the design work necessary to produce design documentation such as plans and specifications necessary to the packaging, advertisement and competitive solicitation of construction bids. In addition, detailed cost estimates are produced during this phase of project implementation suitable for budgeting and funding purposes as well as for obtaining a Full Funding Grant Agreement from the Federal Government.

Depending on the level of design work performed during previous phases, Final Design should be expected to proceed along a schedule similar in length to that inherent in the performance of Alternative Analyses/Corridor Studies and Preliminary Engineering.

#### Construction

The construction phase of most publicly-sponsored capital improvement projects includes the time required for the installation and testing of components, equipment and systems essential to the provision of safe and reliable revenue service. The procurement of such components, equipment and systems - including rolling stock and signaling, communication, dynamic signage and fare vending equipment is generally initiated upon receipt of a Full Funding Grant Agreement from the Federal Government. Given the need to maintain freight traffic during the construction and/or installation of the necessary capital improvements, this phase of project implementation could require anywhere from approximately one year (assuming the use of existing railroad dispatching and maintenance facilities and the availability of conventional rolling stock) to almost twice that in the event new facilities are required.

There remains considerable uncertainty surrounding the Federal Government's willingness to fund commuter rail

improvements as well as the ultimate availability of such funding. Precedent for such is virtually non-existent as of the time of the completion of this study. Consequently, a decision to fund such improvements entirely through state, local and - if available - private resources would allow for a somewhat more aggressive implementation schedule than that suggested above.

Another significant factor that would affect the implementation schedule, is the public participation process. The above schedules do not reflect this process as the number, timing and duration of presentations, hearings and comment reception/resolution activities may vary from project-to-project and from one metropolitan area to another.