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DRAFT ENVIRONMENTAL IMPACT STATEMENT

FROM TH 110 (DAKOTA COUNTY) TO I-94 NEAR DOWNTOWN ST. PAUL

Prepared by: Twin Cities Metropolitan Council
U.S. Department of Transportation-
Federal Highway Administration
and
Minnesota Department of Transportation

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Interstate 35E
From
Trunk Highway 110 in
Dakota County, Minnesota
To
I-94 Near Downtown St. Paul, Ramsey County, Minnesota

DRAFT ENVIRONMENTAL IMPACT STATEMENT

Submitted pursuant to:

42 USC 4332(2)(c)
49 USC 1653(f)
and
Minnesota Statute 116D.01 et. reg.

Submitted by:

U.S. Department of Transportation
Federal Highway Administration
and
The State of Minnesota
Department of Transportation
and
Twin Cities Metropolitan Council

Cooperating Agencies:

U.S. Army Corps of Engineers
U.S. Coast Guard
U.S. Department of the Interior
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
Upper Mississippi River Basin Commission
Minnesota Department of Natural Resources
Minnesota Pollution Control Agency

May 29, 1981	Chas R Weaver	Chairman
Date of Approval	For Met. Council	Title
May 29, 1981	F. C. Marshall	Assistant Commissioner
Date of Approval	For MnDOT	Title
June 4, 1981	Richard R. Lyke	Division Administrator
Date of Approval	For FHWA	Title

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ABSTRACT: This environmental impact statement describes and evaluates twelve alternatives within two corridors for a proposed link between I-35E south of the Minneapolis/St. Paul area to I-94 and I-35E immediately north of Downtown St. Paul. Comments on this Draft EIS are due by September 1, 1981, and should be sent to:

Mr. Ghaleb Abdul-Rahman
I-35E Project Manager
Metropolitan Council
300 Metro Square Bldg.
St. Paul, MN 55101

ENVIRONMENTAL IMPACT SUMMARY

PROPOSED ACTION

The proposed action by the Federal Highway Administration (FHWA) involves participation with funds administered by FHWA in completing the section of I-35E located in the City of St. Paul, which extends from the existing I-35E bridge over the Mississippi River (the Lexington Bridge) to the St. Paul downtown area. The project is called the "St. Paul I-35E Link." This link is approximately five miles long. The entire I-35E lies within the seven-county metropolitan area and represents the eastern corridor of the I-35E split through the metropolitan area. The proposed action is to provide a roadway (freeway or parkway) four to six lanes wide.

ACTIONS REQUIRED BY OTHER FEDERAL AGENCIES

If the freeway alternative in the Shepard Road corridor is selected, permits would be necessary from the U.S. Army Corp of Engineers and the U.S. Coast Guard.

ALTERNATIVES

This EIS considers a no-build alternative, eight alternatives within the Pleasant Avenue corridor, one alternative within the Shepard Road corridor and two alternatives combining both corridors. The alternatives within the Pleasant Avenue corridor provide various combinations of freeway and parkway layouts, truck access and I-94 connections.

BENEFICIAL IMPACTS

All of the build alternatives provide roughly equivalent benefits in terms of improved downtown access, energy conservation, and associated economic development. Improved goods movement and through movement varies among the alternatives.

ADVERSE IMPACTS

Because the Pleasant Avenue corridor has been constructed to rough grade over two-thirds of its length prior to the National Environmental Policy Act and this EIS, over 95% of the required right-of-way and associated displacement has already occurred. By contrast, the right-of-way for the Shepard Road freeway has not been purchased. The Shepard Road freeway also has major adverse impacts on the Mississippi River and its uses. All alternatives, including the no-build, contribute to state noise standards violations. No violation of water quality or air quality standards are likely under any alternative. There would be significant adverse impacts to sites on, or eligible for inclusion on, the National Register of Historic Places with any build alternative, more so with the Shepard Road freeway.

SPECIAL STUDIES

This EIS is based on the findings of the following more-detailed special studies, which were written in response to the issues identified by the public in the scoping process and which are available for public review.

Air Quality Impacts
Preliminary Noise Analysis
Archeological Survey
Neighborhood Project Response, Social Impacts
Wetlands, Fish and Wildlife
Hydrogeology
River Morphology and Flood Hazard
Water Quality
Hydrology/Hydraulics
Central Business District Economic Viability and Development Impact
Urban Landscape/Aesthetic Analysis
Traffic Impacts
Soil Properties
Land Use
Historic Sites Assessment
Potential Impacts, Construction and Operation Vibrations
Energy Impacts

AGENCY COORDINATION

Comments on these special studies have been requested from the following agencies and public groups.

Federal Agencies

Army Corps of Engineers*
Coast Guard*
Department of Interior*
Environmental Protection Agency*
Fish and Wildlife Service*
Heritage Conservation and Recreation Service
Upper Mississippi River Basin Commission*

State Agencies

Department of Natural Resources*
Energy Agency
Pollution Control Agency*
State Historic Preservation Office

*Cooperating agencies as required in 40 CFR Part 1501.6.

TABLE OF CONTENTS

		Page
	ENVIRONMENTAL IMPACTS SUMMARY	ii
I.	PURPOSE AND NEED	1
	A. Project Description	1
	B. Background	1
	C. Transportation Goals and Policies	7
	D. Existing Conditions	9
	E. Future Travel	10
	F. Deficiencies	21
	G. Economic Development	22
	H. Modal Interrelationships	23
II.	ALTERNATIVES	25
	A. Corridor Selection Process	25
	B. Description of the Alternatives	26
	C. Costs	36
	D. Significant Impacts	39
III.	AFFECTED ENVIRONMENT	43
	A. Physical Environment	43
	1. Geology	43
	2. Climate	43
	3. Hydrology	44
	4. Groundwater	44
	5. Water Quality	44
	6. Air Quality	51
	B. Natural Environment	53
	1. Terrestrial Habitats	53
	2. Aquatic Habitats	53
	3. Wildlife	54
	C. Social Environment	57
	1. Primary Impact Area	57
	2. Population	58
	3. Employment	58
	4. Ethnic and Racial Characteristics	61
	5. Community Services	61
	6. Regional Land Use Plans	67
	7. St. Paul's Land Use Plan	67
	8. Neighborhood Land Use Plans	67
	9. St. Paul Mississippi River Corridor Plan	68
	10. Great River Road Master Plan	68
IV.	ENVIRONMENTAL CONSEQUENCES	71
	A. Introduction	71
	B. Geology	77
	1. Unsuitable Foundations	77
	2. Slope Failure	78
	3. Erosion During Construction	79

		Page
	4. Unavoidable Adverse Impacts	80
	5. Irreversible Commitment of Resources	80
C.	Hydrology	83
	1. Increased Impervious Surface	83
	2. Storm Sewer Adequacy	83
	3. Aquifer System Impact	84
	4. Construction Impacts	85
D.	Mississippi River Floodplain Impacts	91
	1. Floodplain Description	91
	2. River Use	91
	3. Floodplain Hazard Evaluation	91
	4. Impacts at Normal Pool Elevation	92
	5. Impacts and Mitigation Due to Increased Flood Elevations	92
	6. Impacts and Mitigation Due to Increased Flood Velocities	93
	7. Effects on Natural and Beneficial Floodplain Values	94
	8. Other River Impacts	95
	9. Determination of Significant Encroachment	96
	10. Practicability of Alternatives	97
	11. Unavoidable Adverse Impacts	98
	12. Short-Term/Long-Term Relationship	98
	13. Irreversible Commitment of Resources	98
E.	Water Quality	101
	1. Stormwater and Meltwater Runoff	101
	2. Groundwater Impacts	104
	3. Spills	104
	4. Construction	105
F.	Ecology	109
	1. Impacts and Mitigation Relating to Vegetation, Wildlife and Aquatic Communities	109
	2. Wetlands	111
	3. Threatened and Endangered Species	113
G.	Air Quality	119
	1. Construction	119
	2. Regional Impacts	120
	3. Microscale Carbon Monoxide Impacts	120
	4. Lead	121
	5. Mitigation	121
	6. Irreversible Commitment of Resources	121
H.	Noise	127
	1. Construction Noise	127
	2. Operational Noise	127
	3. Mitigation	128
	4. Short-Term/Long-Term Relationship	130
	5. Unavoidable Adverse Impacts	130
	6. Irreversible Commitment of Resources	130

		Page
I.	Transportation and Traffic	137
	1. General	137
	2. Transportation-Related Objectives	140
	3. Mitigation	148
	4. Unavoidable Adverse Impacts	150
	5. Short-Term/Long-Term Relationship	150
	6. Irreversible Commitment of Resources	150
J.	Land Use	155
	1. Plan Compatibility	155
	2. Associated Development	156
	3. Joint Development	159
	4. Short-Term/Long-Term Relationship	159
	5. Irreversible Commitment of Resources	159
K.	Social	165
	1. Relocation	165
	2. Changes in Property Value	168
	3. Impacts on Potentially Sensitive Groups	169
	4. Impacts on Public Services	169
	5. Mitigation	170
	6. Unavoidable Adverse Impacts	171
L.	Economics	175
	1. Construction Costs and Employment	175
	2. Tax Base Reduction	175
	3. Changes in Development Potential	177
	4. Net Fiscal Impacts	179
	5. Irreversible Commitment of Resources	179
M.	Vibration	183
	1. Structural Damage	183
	2. Visual Clarity Required During Surgery	183
	3. Irritation	183
	4. Mitigation	184
N.	Energy	187
	1. Direct and Indirect Energy Impacts	187
	2. Impacts of High Occupancy Vehicle (HOV) Lanes	188
	3. Energy Impact of Light Rail Transit	190
	4. Impacts of Transportation System Management Measures	190
	5. Unavoidable Adverse Impacts	190
	6. Irretrievable Commitment of Resources	191
O.	Aesthetics	193
	1. Views of the Road	193
	2. Views from the Road	193
	3. Mitigation	194
	4. Selected Landscape Mitigation Concepts	205
	5. Unavoidable Adverse Impacts	206
P.	Sites of Local Historic Interest	211
	1. St. Paul Masonic Temple	211
	2. Fredrick Emmert House and 276 Chestnut	212
	3. Archeologic Sites	212
	4. Irreversible Commitment of Resources	213

		Page
V.	SITES ELIGIBLE FOR 106 REVIEW	215
	A. Introduction	215
	B. Identification of Historic Sites	215
	C. Preliminary Determination of Effect	216
	1. Historic Hill District: Selby Avenue Tunnel, James Hill Mansion	216
	2. Quinlan Care Home	218
	3. How Residence	221
	4. Panama Flats	222
	5. Nathan Myrick Residence	222
	6. Wabasha Street Bridge	223
	7. Smith Avenue High Bridge	224
	8. Minnesota Boat Club Boathouse	225
	9. GTA Number 1 Grain Terminal	225
VI.	4(f) PROPERTIES	227
	A. Introduction	227
	1. Purpose of Statement	227
	B. Parks and Recreation Lands	227
	1. Proposed Warner Road Overlook	228
	2. Crosby Farm Region Park and Proposed Park Addition	228
	C. Historic Sites	235
	1. German Presbyterian Church	235
	2. St. Paul Union Depot	238
	3. Robert Street Bridge	239
	4. Chapel of St. Paul	243
	5. Irvine Park Historic District: Wright-Prendergast House, Henry Horn House	244
	6. Proposed Butternut Avenue Historic District	248
	7. Chicago Greatwestern Lift Bridge	249
	8. Northern Pacific Freight House	250
	D. Coordination with Jurisdictional Agencies	254
VII.	LIST OF PREPARERS	255
VIII.	LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT	259
IX.	COMMENTS AND COORDINATION	261
	1. Scoping Process	261
	2. Issues, Concerns and Special Studies	261
	3. Coordination Process	264
X.	INDEX	267
XI.	APPENDICES	
	A - Alternative Layouts	A-1
	B - Predicted Noise Levels	B-1
	C-S - Special Studies Incorporated by Reference	C-1

LIST OF FIGURES

Figure Number		Page
1.	Project Location	3
2.	I-35E Study Area	5
3.	Current CBD Access from the South	11
4.	Truck Routes in Primary Impact Area	13
5.	Travel Desires	15
6.	Selected Average Daily Traffic Volumes - Year 2000	19
7.	Potential I-35E Corridors Identified in Phase I	27
8.	I-35E Alternatives	29
9.	Indirect Connection	33
10.	Geologic Cross Section	45
11.	Soils Map	47
12.	Surface and Groundwater Drainage	49
13.	Existing Vegetation	55
14.	Existing Land Use and Planning Districts	59
15.	Public Service Boundaries and Health Care Facilities	63
16.	Recreation Facilities	65
17.	St. Paul's Land Use Plan	69
18.	Geologic Impacts	75
19.	Floodplain and Water Related Impacts	89
20.	Air and Noise Monitoring Locations	117
21.	Traffic Impacts	135
22.	Land Use Impacts	153
23.	Right-of-Way and Relocation Impact Areas	163
24.	Views of the Road - Pleasant Avenue Corridor	195
25.	Views of the Road - Shepard Road Corridor	197
26.	Aesthetic Mitigation - Pleasant Avenue Corridor	199
27.	Aesthetic Mitigation - Shepard Road Corridor	201
28.	Selected Landscape Mitigation Concepts	203
29.	Regulated Lands - Historic and Recreational Properties	209
30.-34.	Detailed Site Plans and Photos of Impacted Historic and Recreational Properties	219, 229, 241, 245, 251
A.1.	Alignment for Freeway in Pleasant Avenue Corridor: Alternative A, A'	A-2
A.2.	Alignment for Freeway in Shepard Road Corridor: Alternative B	A-3
A.3.	Alignment for Parkway Alternates in Pleasant Avenue: C-H	A-4
A.4.	No-Build Alternate - Land Use Plan	A-5
A.5.	Alignment for Parkway Alternates in Pleasant Avenue with East Side CBD Bypass: Alternates J and K	A-6

LIST OF TABLES

Table Number		Page
1.	Estimated Costs for I-35E Alternatives	37
2.	Significant Impacts	41
3.	Mississippi River Violations of MPCA Water Quality Regulations	51
4.	Total Minority Population in St. Paul	62
5.	Geology Impacts	73
6.	Hydrology Impacts	81
7.	Mississippi River Floodplain Impacts	87
8.	Water Quality Impacts	99
9.	Model Runoff Water Quality (Storm Runoff)	102
10.	Model Runoff Water Quality (Snowmelt)	103
11.	Ecology Impacts	107
12.	Air Quality Impacts	115
13.	Predicted One-Hour Ambient Carbon Monoxide Concentrations	122
14.	Predicted Eight-Hour Ambient Carbon Monoxide Concentrations	123
15.	Noise Impacts	125
16.	Transportation and Traffic Impacts	131, 133
17.	Transportation Objectives and Criteria for Impact Measurement	141
18.	Land Use Impacts	151
19.	Social Impacts	161
20.	Businesses and Facilities to be Taken or Relocated	167
21.	Economic Impacts	173
22.	Direct Economic Impacts of Construction	176
23.	Estimated Annual Development Potentials	178
24.	Vibration Impacts	181
25.	Energy Impacts	185
26.	Energy Consumption Over Life of Project	189
27.	Energy Impact of HOV Lanes	190
28.	Historic Properties Impacts	207

I. PURPOSE AND NEED

PROJECT DESCRIPTION

Location

The proposed project involves completing the section of I-35E located in the City of St. Paul, which extends from the existing I-35E bridge over the Mississippi River (the Lexington Bridge) to the St. Paul downtown area. The project is called the "St. Paul I-35E Link." This link is approximately five miles long. The entire I-35E lies within the seven-county metropolitan area and represents the eastern corridor of the I-35 split through the metropolitan area. This is shown in Figure 1.

The study termini, the primary and secondary impact areas and the study corridors are all shown in Figure 2. The primary impact area was chosen to capture all of the localized impacts which might be associated with construction and operation of a roadway facility in the Pleasant Avenue or Shepard Road corridors. Other impacts, such as land development potentials, occur on a larger geographic scale identified as the Secondary Impact Area.

Two points in the metropolitan interstate freeway system have been established as limits for the identification of potential I-35E corridors. These termini represent the logical "tie-in" points in the interstate system for purposes of this study. The south terminus (A) is located at the proposed I-35E/I-94 interchange in Dakota County. The north terminus (B) is located at the existing I-35E/I-694 interchange in Ramsey County. Study termini have been located at points beyond the immediate project for two reasons: (1) to allow investigation into more alternatives than possible if only the project area were studied, and (2) to permit consideration of social, economic and environmental aspects in a broad scope.

BACKGROUND

The need for a roadway to serve the southwest portion of St. Paul was first recognized in the 1920s, when the city identified Pleasant Avenue as a major roadway in the Plan for St. Paul.

Origin-destination studies conducted by the City of St. Paul and the Minnesota Highway Department in 1946 and 1950 confirmed the need for a major roadway facility capable of carrying traffic generated by development in southwest St. Paul and in northern Dakota County.

A 1954 study, Highway Transportation in Minnesota, published for the Minnesota Highway Study Commission, identified the Pleasant Avenue corridor as a major St. Paul thoroughfare. In 1954 the St. Paul City Council identified critical areas where highway right-of-way was required. The Council directed that building permits be withheld in those areas. Portions of the Pleasant Avenue corridor were included.

I-35E along the Pleasant Avenue alignment was first proposed in the September 1955 report General Location of National System of Interstate Highways. Approvals were received from the St. Paul City Council and the Bureau of Public Roads (predecessor of the Federal Highway Administration) for I-35E in this location in 1957. The Minnesota Highway Department held a public hearing on the proposed location of the interstate system in St. Paul, and no objections were raised to the proposed location of I-35E.

Detail design studies for the portion of I-35E from West Seventh Street to Duke Street were authorized in 1961, and for the portion from Duke Street to I-94 in 1962. Most of the right-of-way for the project was acquired before 1967. I-35E construction commenced in 1964 with the letting of contracts for storm sewers, grading, paving, construction of bridges and their roadway approaches.

Right-of-way acquisition in the Pleasant Avenue corridor for the St. Paul link of I-35E is from 90% to 95% complete. Work in the categories of clearing, grubbing, excavation, earth moving, grading, construction, drainage tunnels, structures, and bridge construction are from 40 percent to 90 percent completed. Nine of the 15 highway bridges and the one railroad bridge on the project have been constructed. Grading work is complete from West Seventh Street to St. Clair Avenue, three-quarters of the total length. Slope stability structures in the vicinity of St. Clair Avenue and Kellogg Boulevard are in place. There has been essentially no construction on I-35E in St. Paul since August 1972. Investment to date is equivalent to $54,250,000 in 1980 dollars.

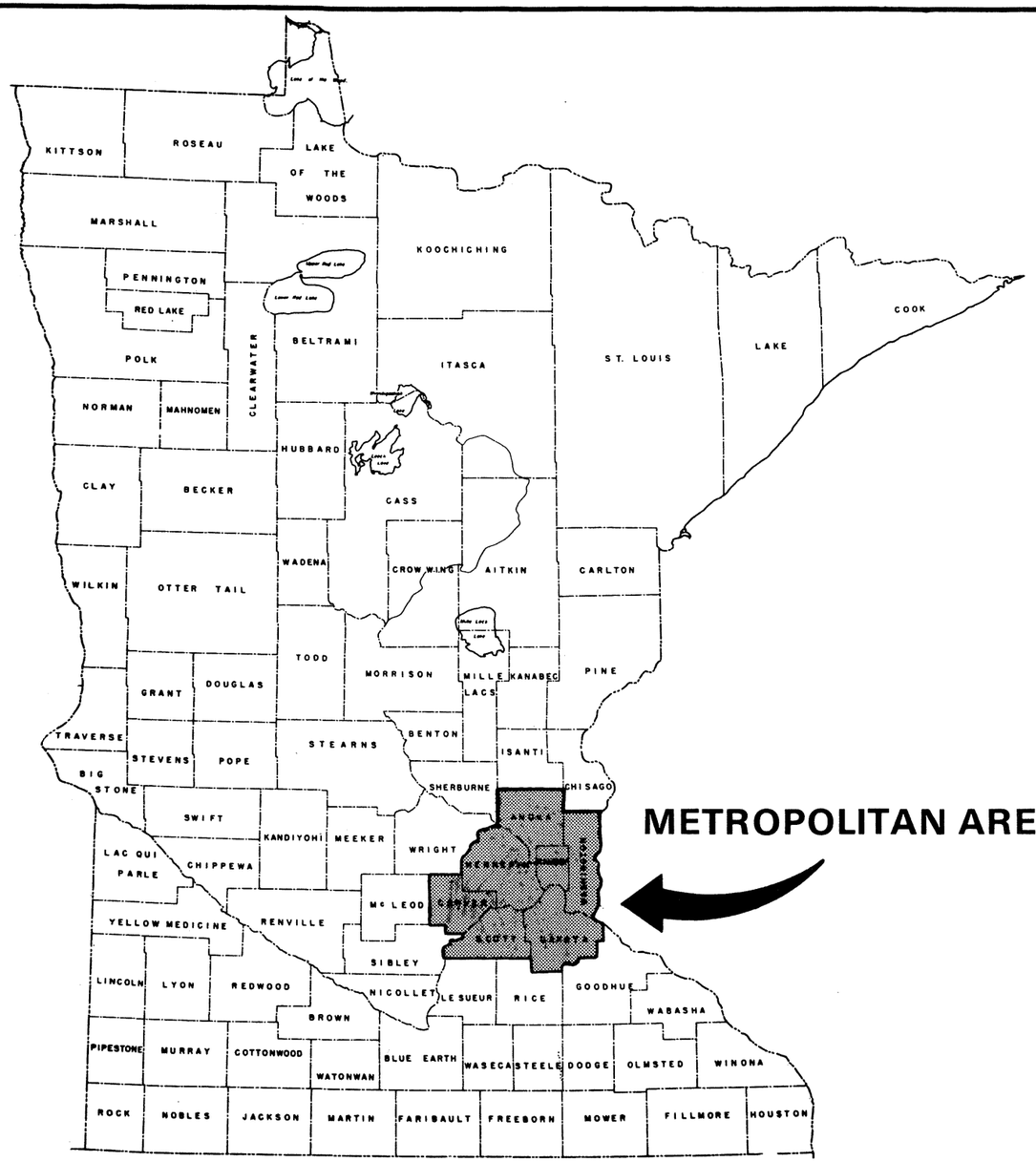
The Metropolitan Council approved I-35E in the Pleasant Avenue corridor in 1969, and the State Planning Agency approved the project in 1970.

Construction of I-35E was stopped by a joint lawsuit involving the City of St. Paul and four neighborhood groups in 1972. A stipulation agreement required the preparation of an Environmental Impact Statement for the facility.

The environmental impact report was prepared and public hearings were held in 1975. The City of St. Paul passed a resolution in support of the completion of a roadway in the Pleasant Avenue corridor with restrictions regarding facility connections and truck access.

The Minnesota Legislature placed a moratorium on further freeway construction in the Pleasant Avenue corridor in response to citizen opposition in 1975.

In 1977, the St. Paul City Council reaffirmed their 1975 resolution and further resolved that an EIS immediately commence to resolve the several outstanding issues regarding the St. Paul link of I-35E. The City Council also resolved that the St. Paul link be removed from the National System of Interstate and Defense Highways.



METROPOLITAN AREA

PROJECT LIMITS

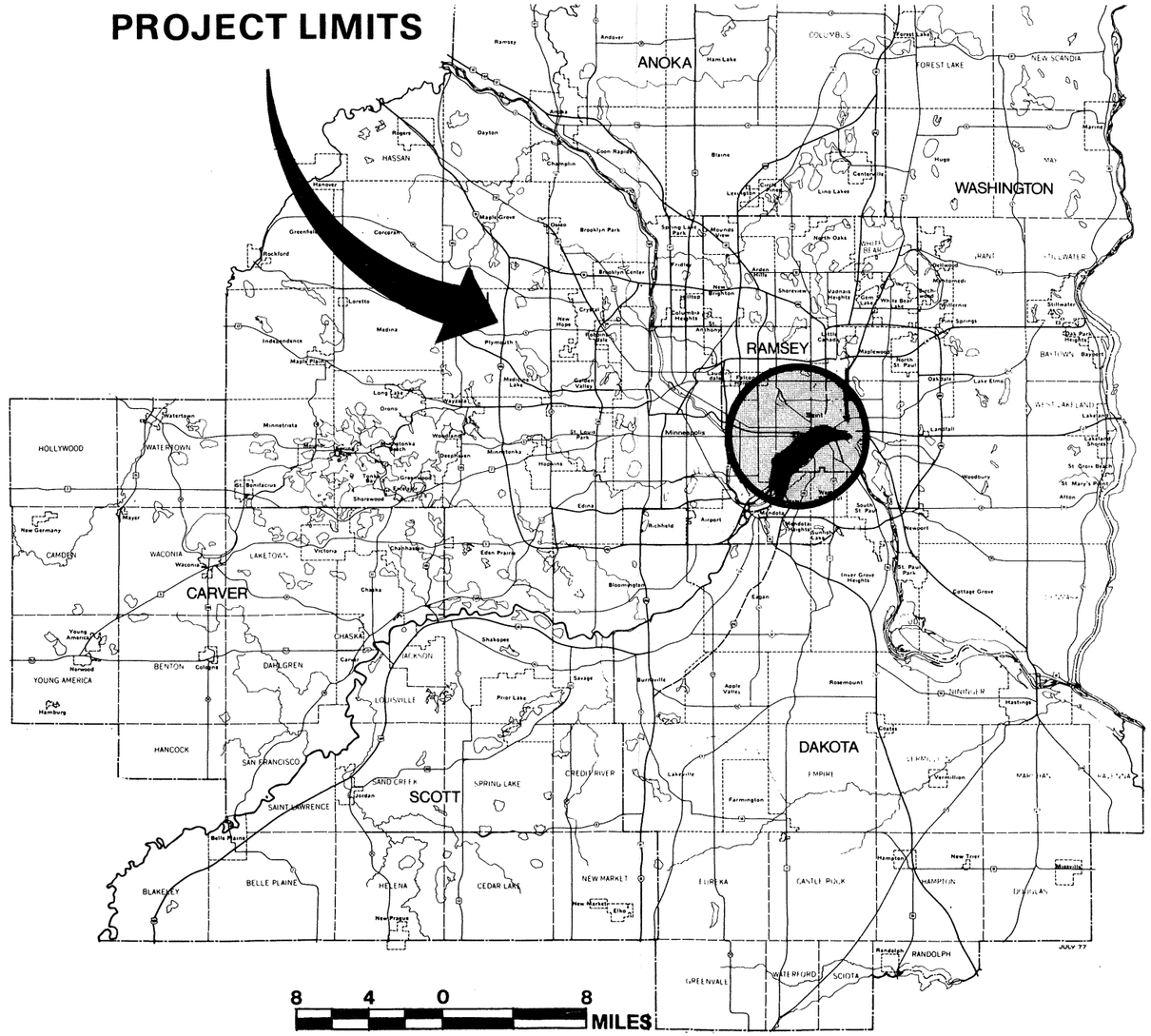


FIGURE 1

PROJECT LOCATION

I35E

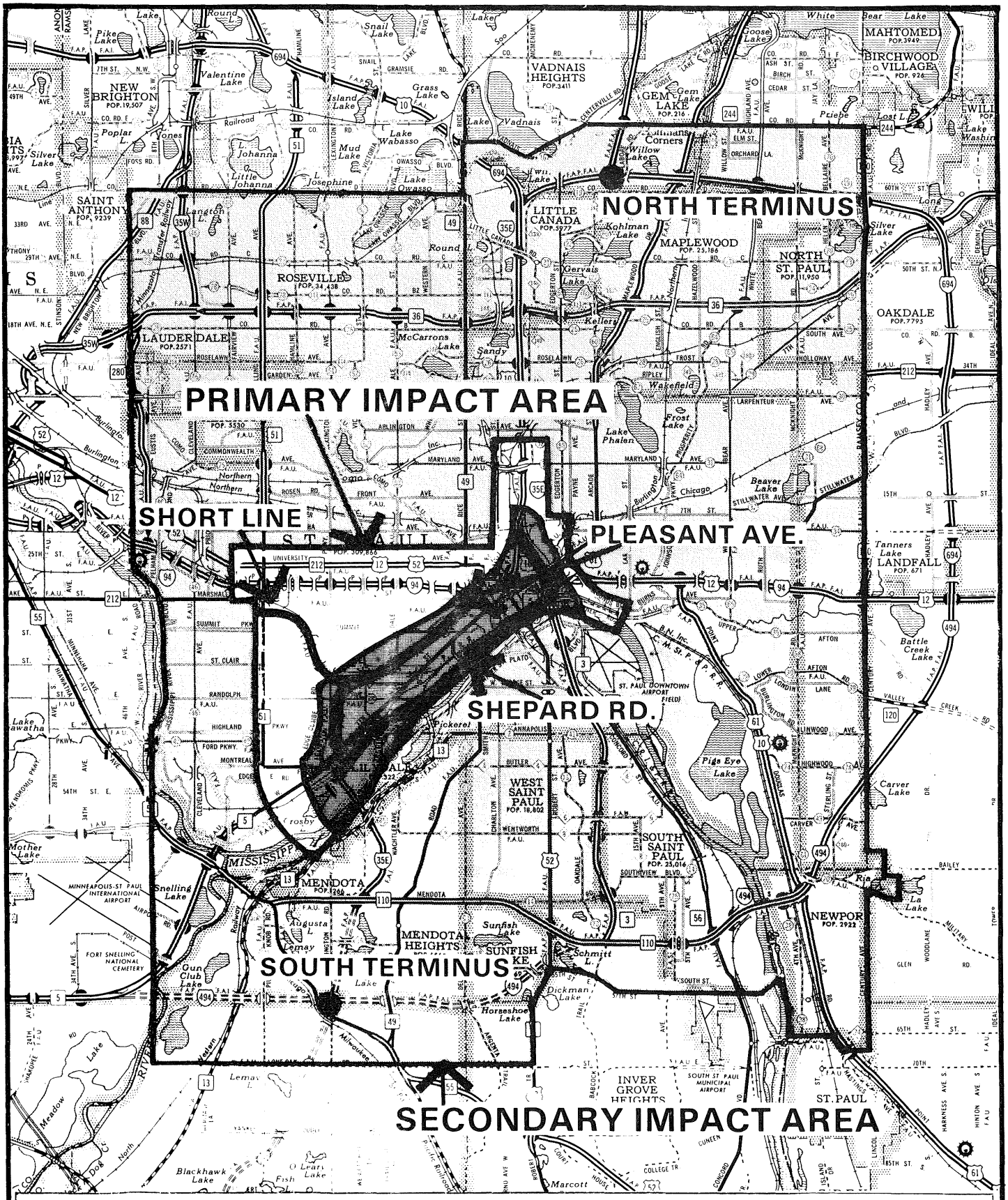


FIGURE 2

I-35E STUDY AREA

135E

In 1978, the Minnesota Legislature directed the Minnesota Department of Transportation who in turn requested the Metropolitan Council to prepare an in-depth EIS on the Pleasant Avenue corridor and feasible alternatives (M.S. 1978, Section 161.124). Phase I of the study, which identified the parameters of the study and feasible alternatives for I-35E, commenced in 1978 and was completed in 1979. The Phase I Report fulfilled the State Action Plan requirements for the Project Development Report and the Preliminary Location Report. Phase II, preparation of the Draft Environmental Impact Statement, is currently underway.

TRANSPORTATION GOALS AND POLICIES

Five principal reasons for completing the I-35E project have been identified:

- To relieve the expected levels of vehicular congestion in Dakota and Ramsey counties by the year 2000.
- To provide for safer travel.
- To provide efficient transportation services for the residents located in southwest St. Paul and in northern Dakota County.
- To provide the accessibility required by the existing, new and programmed development in downtown St. Paul.
- To provide a balanced regional interstate system.

Additionally, there are a number of pertinent goals and policies promulgated by the Federal Highway Administration (FHWA), the Minnesota Department of Transportation (MnDOT), the Metropolitan Council (MC) and the City of St. Paul which address the need for the I-35E project. These are shown as follows:

Federal Goals

The Federal Highway Administration's position statement emphasized the following objectives:

1. "...to connect, as directly as possible, the principal metropolitan areas, cities, industrial centers, and to serve the national defense. The national objective for penetrating routes such as I-35E is to provide good internal regional circulation for interstate traffic to reach concentrations of population, commerce and industry."(1)

2. "...to complete the interstate system. This can be done by either building the remaining segments of the interstate system, or in the case of noncritical segments, dropping them from the system. It is, therefore, essential that state, regional and local interests reach a decision on I-35E in a timely manner in order to meet this goal."(1)

(1) Letter from E. Dean Carlson, FHWA to John Boland, May 9, 1978.

State Goals

The Minnesota Department of Transportation Plan (MnDOT/Plan) has set no specific goal for the completion of I-35E in the City of St. Paul. However, MnDOT has consistently supported the position that the necessary environmental studies should be completed in order to select the most attractive alternative for I-35E within the City of St. Paul, including the no-build alternate.

Metropolitan Goals

The Metropolitan Council Transportation Policy Plan of 1976 provides policy guidelines for transportation decisions to be made in the Twin Cities Metropolitan Area. The completion of I-35E is part of the adopted Transportation Policy Plan. Additionally, pertinent goals relating to transportation facilities such as I-35E are shown as follows:

Metropolitan Council Transportation Goals

1. Provide metropolitan residents with good accessibility to sub-regional and regional opportunities.

2. Provide residents of the Urban Service Area, as defined in the Development Framework, with efficient, convenient and attractive alternative choices of transportation to both subregional and regional opportunities.

3. Utilize transportation to strengthen the two metro centers as the major employment, financial, institutional, retail, cultural, entertainment, medical and service centers for the metropolitan area, the State of Minnesota and the Upper Midwest area of the United States.

4. Coordinate metropolitan transportation services and investments with the other metropolitan services and investments; determine priorities on the basis of overall metropolitan needs and the ability of the metropolitan area to support the needed services and investments over time.

5. Provide transportation facilities and services that produce positive impacts upon the social, economic and physical environment, and will conserve the supply of metropolitan energy resources.

6. Attain a regional transportation planning and programming process that is responsive to the needs and interests of metropolitan residents, groups, counties, municipalities and affected agencies -- with sufficient opportunity provided for them to participate in policy and implementation decisions.

City Needs and Policies

According to the latest St. Paul Transportation Plan, the completion of I-35E is consistent with city goals and policies. Among the more relevant are these:

- Access Deficiency to Midway District from the North and South(2)

- Finish Committed Freeways and Other Class I Routes

The remaining sections of the interstate system should be completed. Other Class I Principal Arterials proposed in the Metropolitan Council's Metropolitan Development Guide should also be completed with reasonable priority.(3)

EXISTING CONDITIONS

System Linkage

Currently, the Primary Impact Area is served by two interstate roadways: I-94, an east-west facility, and I-35E, north of the St. Paul Central Business District (CBD). Access to the CBD from the south I-494 Beltway is obtained by three roadways, limited largely to the Lafayette Freeway (Trunk Highway (TH) 3), Robert Street (TH 52), and the Smith Avenue/High Bridge (TH 149). Access to the south is also possible through the use of the segment of I-35E completed from TH 110 to Shepard Road, by crossing the Lexington Bridge, then via Shepard northeasterly to the CBD. These roadways are shown in Figure 3.

The Primary Impact Area is characterized by a shortage of continuous north-south arterials. Two streets which presently serve the continuous function are Snelling and Lexington, from Montreal Avenue on the south to University Avenue on the north. These are shown in Figure 3. These streets, spaced at one-mile intervals, also interchange with I-94. The other interchanges with Dale and Marion Sreets to the east do not provide linkage to the south because of the geographical barriers associated with the Pleasant Avenue bluff, the Milwaukee Road Railroad tracks and the surrounding residential areas. Travel from the CBD to the southwest area of St. Paul is accomplished largely by use of West Seventh and by Shepard Road.

Pleasant Avenue was formerly a heavily traveled arterial but its continuity has now been interrupted by the completion of a portion of the I-35E construction.

Existing Travel Patterns

There is currently heavy usage of the four previously mentioned arterials, Snelling, Lexington, West Seventh and Shepard Road. Shepard Road carries approximately 22,000 Average Daily Traffic (ADT) north of Randolph to the Jackson/Sibley pair. Snelling presently

---

(2) St. Paul Street and Highway Plan. Volume 1. Problems and Opportunities 1977. p. 42.

(3) St. Paul Street and Highway Plan. Volume 2. Policy Plan and Classification System, 1977. p.8.

carries approximately 21,000 ADT north of Randolph and Lexington Avenue carries in excess of 23,000 ADT north of Summit Avenue. West Seventh is currently accommodating more than 15,000 ADT over most segments in the Primary Impact Area.

The interstate system carries a very heavy load, particularly on I-94 from east of Lexington to the western boundary of the Common Section of I-94 and I-35E, the so-called Capitol Approach area. This segment carries over 100,000 ADT.

Truck Routes

Truck routing through the Primary Impact Area is provided on only a limited number of roadways, shown in Figure 4. Truck access is provided between the existing Lexington Bridge and the Midway area by the Montreal-Snelling connection.

FUTURE TRAVEL

Desire Lines

If one examines the year 2000 forecasts for trip productions and attractions in the study area, a number of observations can be made. To begin with, such an examination permits the identification of so-called desire lines for daily trips of varying purposes. The desire lines are independent of planned facilities in the sense that they show magnitudes of travel patterns by corridors between selected origins and destinations. The desire lines are exhibited in Figure 5.

Figure 5 exhibits the travel patterns of all home-based trips attracted to the St. Paul CBD from the metropolitan area, excluding the CBD itself. A daily total of 179,700 such trips is forecast for the year 2000. Home-based trips are defined as those trips with one end at home. These typically account for more than 80% of all trips. To the southwest of the CBD represents the potential travel shed area for any proposed I-35E construction. On the other hand, southeasterly from the CBD represents an area served by TH3 (Lafayette Freeway), while northeast from the CBD would serve as the shed area for I-35E north of the CBD. To the northwest is an area served by TH36 and Snelling Avenue north of University Avenue (TH51). From Figure 5, it is possible to see that total home-based travel to the CBD is expected to be nearly equally balanced between areas to the southwest and northeast, each accounting for approximately 20% of all home-based trips to the CBD. Of the southwestern trips, however, the majority will originate south of Randolph and west of Lexington. These trips destined to the CBD are presently not well-served by existing roadways in the area. West Seventh Street and the east-west roadways north of the bluff area now serve this need. To the extent that these arterials will be unable to carry more traffic by the year 2000 due to capacity limitations, there is a need for an additional roadway to carry traffic in this corridor.

It should be noted that over 40% of all home-based trips to the St. Paul CBD originate outside the study area. Most of these will come

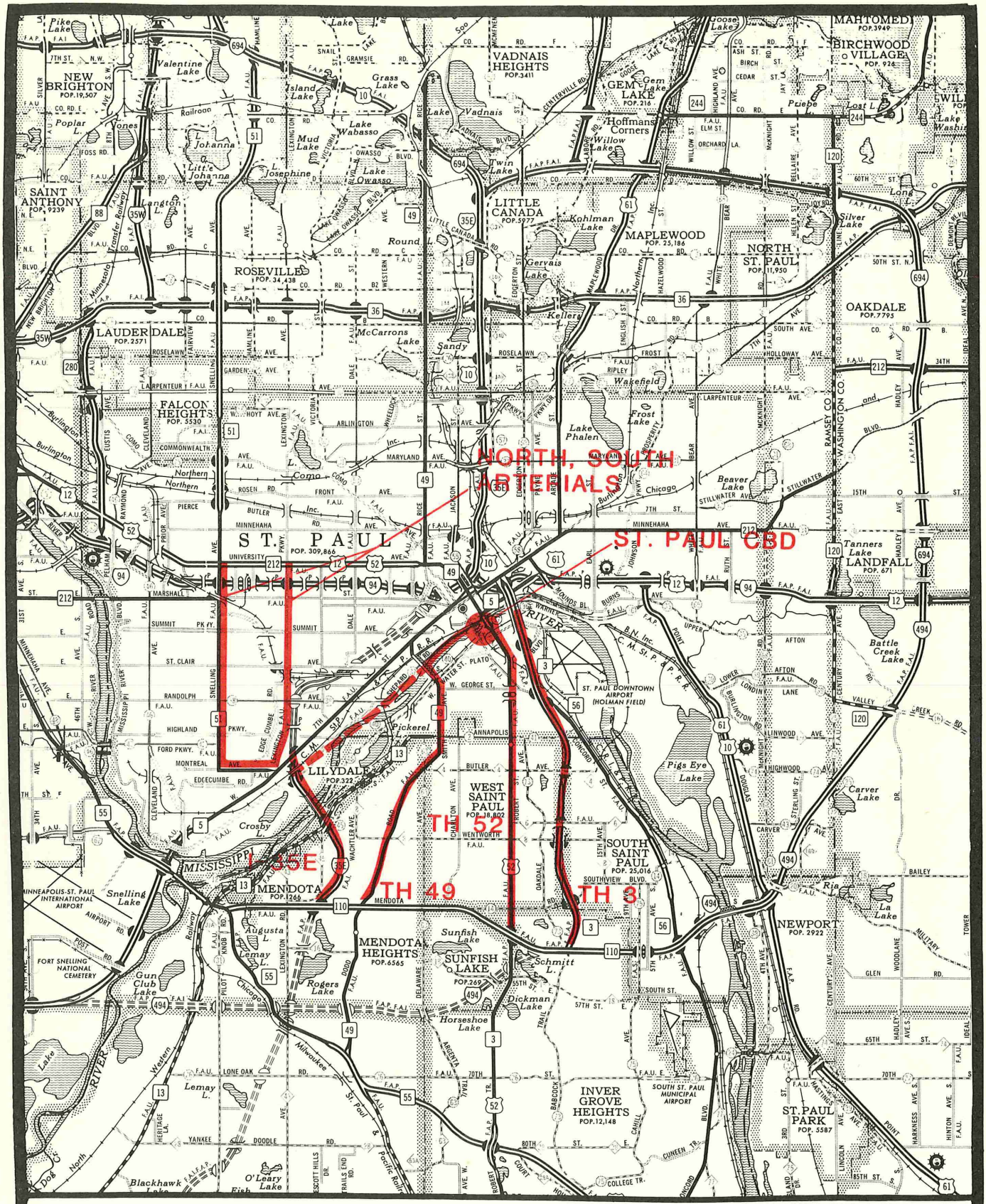


FIGURE 3

CURRENT CBD ACCESS FROM THE SOUTH

I35E

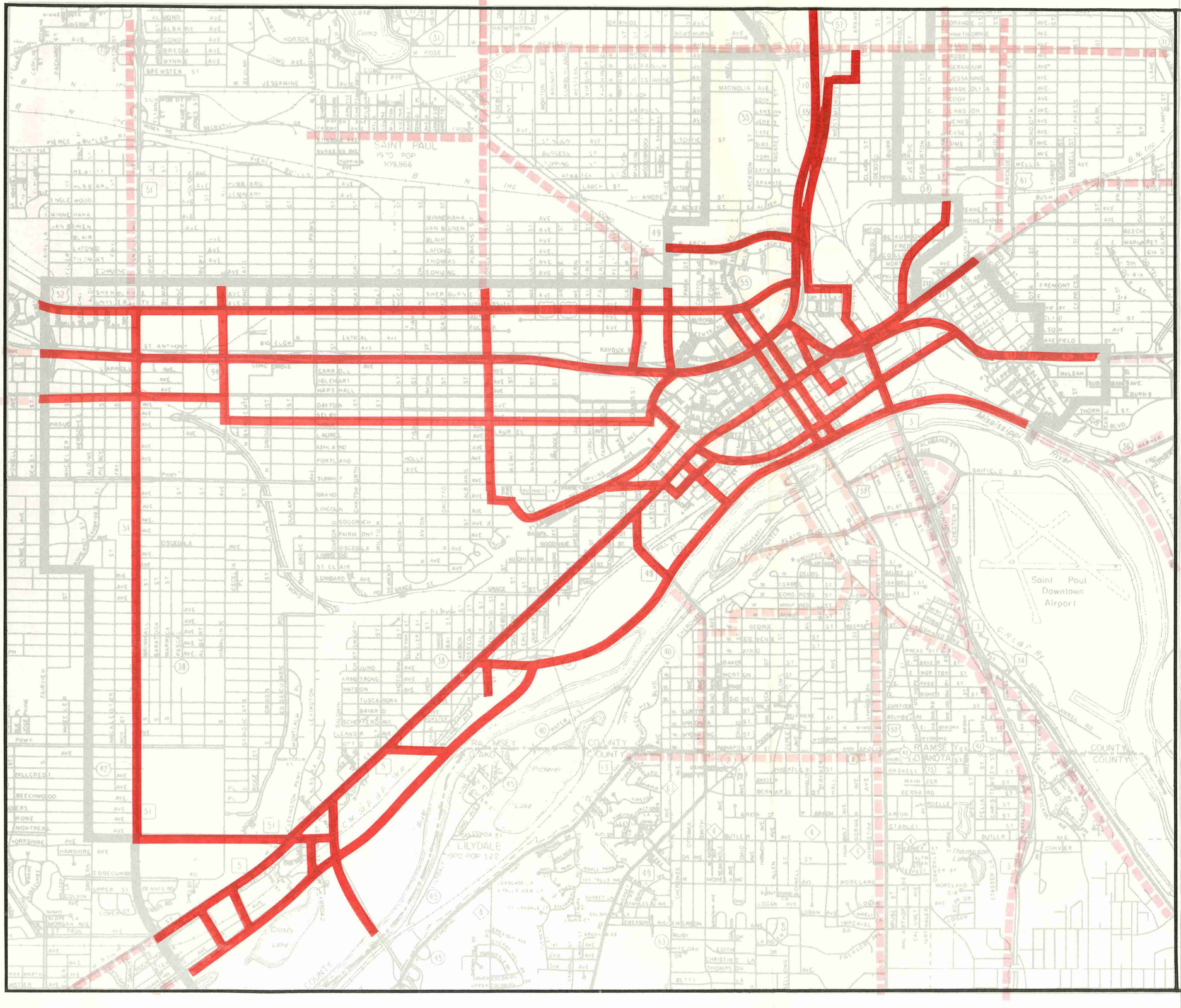
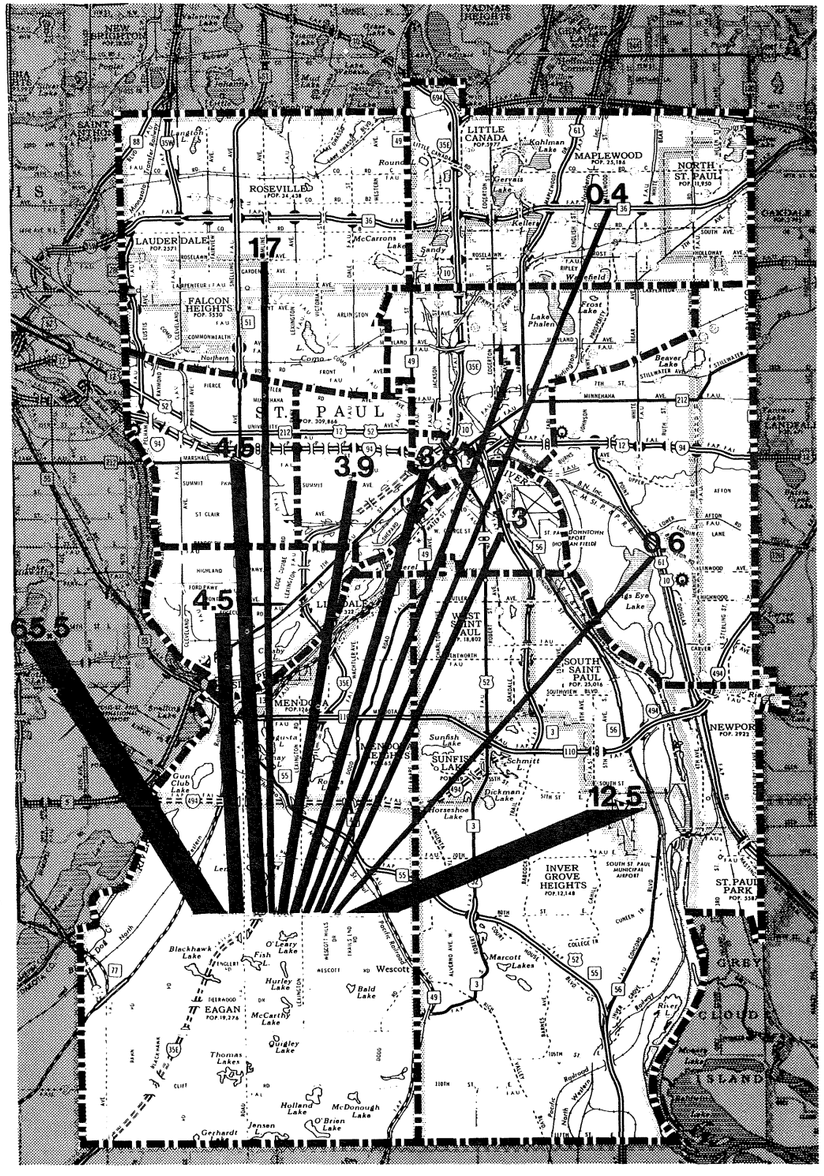
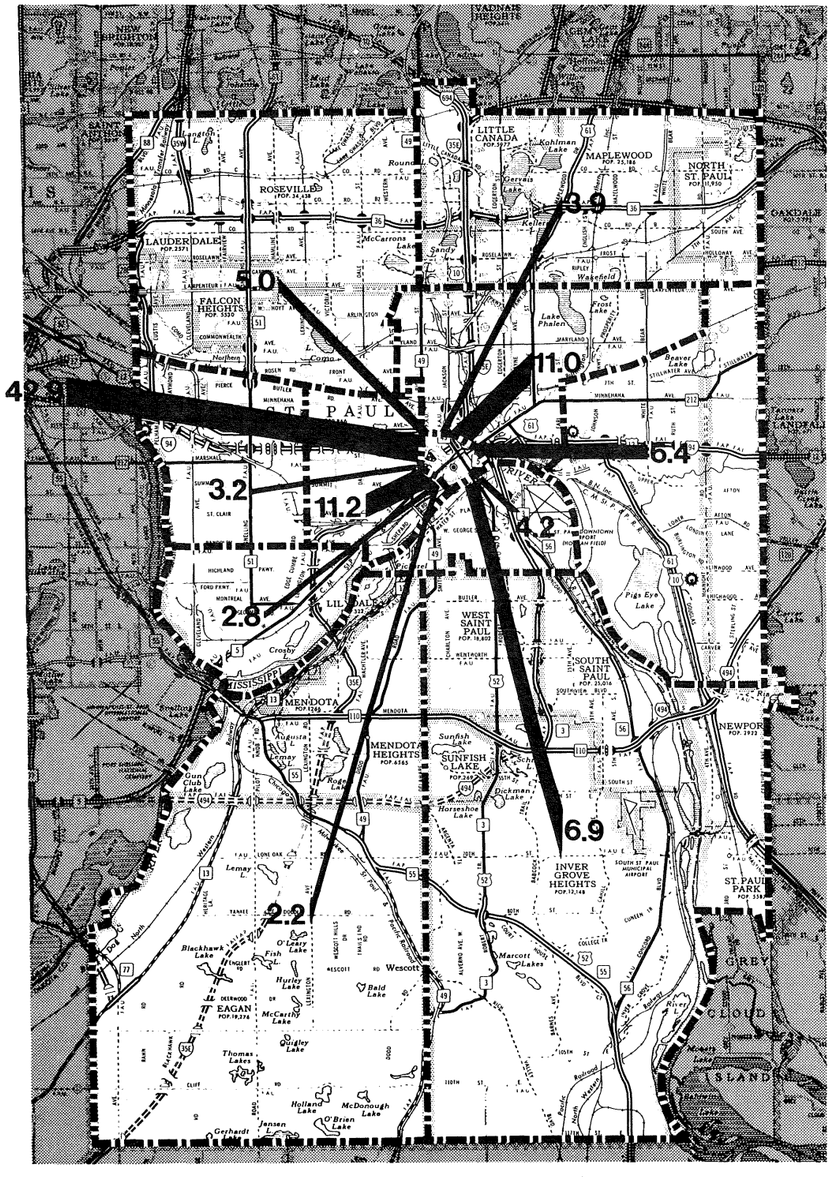

SAINT PAUL
1970 POP
309,866
LILYDALE
1970 POP 322
Saint Paul
Downtown
Airport
RAMSEY
COUNTY
0
2000
4000
8000 Feet
135E

FIGURE 5

TRAVEL DESIRES



TRAVEL DESIRES FROM NORTHWEST DAKOTA COUNTY: PERCENTAGES OF ALL HOME BASED TRIPS TO STUDY AREA



TRAVEL DESIRES TO ST. PAUL CBD: PERCENTAGES OF ALL HOME BASED TRIPS FROM STUDY AREA (EXCLUDING CBD)

0 2.5 5 mi.

135E

from Hennepin County, but a significant number will originate from Dakota County, Washington County and Anoka County as well.

Figure 5 also exhibits the percentages of all home-based trips, totaling 106,500 per day produced from the northwest Dakota County area. As might be expected, the vast majority of these trips will be oriented to other parts of the metropolitan area outside the study area, primarily to the remainder of Dakota County and to south Hennepin County. However, fully 18.4% of these trips will be oriented to areas north of the Mississippi River and west of the CBD. These are trips potentially affected by construction of an I-35E facility north of the river.

External Travel

There is limited need to provide continuity via I-35E for trips traveling through the metropolitan area. Analysis was made of the desire lines of those external trips traveling from south of the I-35W terminus with I-35 in Dakota County to the I-35W/I-35E connection in Anoka County.

Travel Patterns - No-Build Scenario

Travel forecasts for the year 2000 are exhibited in Figure 6 for the situation in which no new construction takes place. A number of key observations can be made from analysis of the forecast volumes. Access to the St. Paul CBD from the southwest will be made more difficult than is presently the case, in view of the fact that West Seventh and Shepard Road are the only two facilities providing such service. Second, access to the Short Line and North Snelling areas will be made very difficult.

Furthermore, access to the Midway and North Snelling areas from the Lexington Bridge will remain very difficult. For many motorists and for all trucks, this connection can only be made by a combination of Montreal and Snelling avenues. Hence, the traffic volumes will remain high compared with volumes currently experienced on Snelling.

Traffic along I-94 between Snelling Avenue and the Common Section of I-35E/I-94 will increase over current volumes because of the shortage of direct-connection arterials to the CBD north of Randolph. This shortage would lead to the use of I-94 for trips made to the CBD by St. Paul residents living to the west of Lexington.

Under the no-build scenario there will be insufficient roadway capacity for the accommodation of trips between the CBD and residential areas to the southwest. Additionally, there will be insufficient roadway capacity for trips from the Lexington Bridge and from the West Seventh neighborhoods and the North Snelling/Midway areas. Consequently, the use of south Lexington (south of St. Clair), Victoria and other local streets for accomplishing through trips is encouraged. There appears to be an inappropriate usage of these roadways in view of the adjacent residential usage and of the numerous residential driveway entrances in this area.

The existence of high levels of commuter traffic on West Seventh and on Lexington Avenue south of St. Clair together with the high usage of cross streets (Randolph, for example) would contribute to high accident rates along each of these routes. The further usage of such routes for accomplishing through travel will, no doubt, make this situation worse.

Travel Patterns - Build Scenario

For the purposes of analyzing changes in travel patterns under a build situation, Alternate A (freeway in Pleasant Avenue) has been chosen to represent the build alternates. This was done primarily because this was the one alternate which afforded the greatest opportunity for mobility and for unrestricted movement. In this manner, "ultimate" travel desires might be identified and contrasts could be drawn between the build and the no-build situations.

The future forecast volumes are shown in Figure 6 for Alternates A and A' (the six-and four-lane freeway alternates). The major shifts in travel patterns are away from local north-south streets (South Lexington and Victoria, for example) and onto the freeway together with the Short Line. This also applies to the diversion of trips from West Seventh and Shepard Road onto the Pleasant Avenue facility. This reflects, in part, the existence of a direct connection facility both for trips bound for and past the CBD and in part the existence of a limited-access facility with a much more direct routing to and around the CBD. It should be noted that changes are not as great (compared with the No-Build Alternate) on Snelling, Hamline and Lexington north of the Short Line as changes on the same streets south of St. Clair. This reflects the attractiveness of the Pleasant Avenue facility for diverting longer through trips on the south end from local streets to the freeway.

It should also be noted that future volumes along I-94 between Snelling and the Common Section are reduced under the freeway alternates compared with the No-Build Alternate. This reflects the usage of Pleasant Avenue for trips to and past the CBD by residents north of Randolph and west of Lexington Avenue.

The examination of projected travel along selected links in the network permits observations about trip origins and destinations. Such an examination was carried out under a build option in the Pleasant Avenue corridor. Year 2000 daily trips traveling northbound were examined at two locations: (a) between St. Clair and Grand/Ramsey and (b) on the Lexington I-35E Bridge. The percentages of those northbound daily trips originating from various locations were shown for the first location along with their destination percentages. Only the destination percentages are shown for the second location.

For this first location, origins are split evenly among three general locations: 32% from the Lexington Bridge, 34% from West Seventh and the Highland area of southwest St. Paul. The remaining third (34%) come from residential locations to the east of Snelling and north of West Seventh. Their destinations are split as follows: 40% are

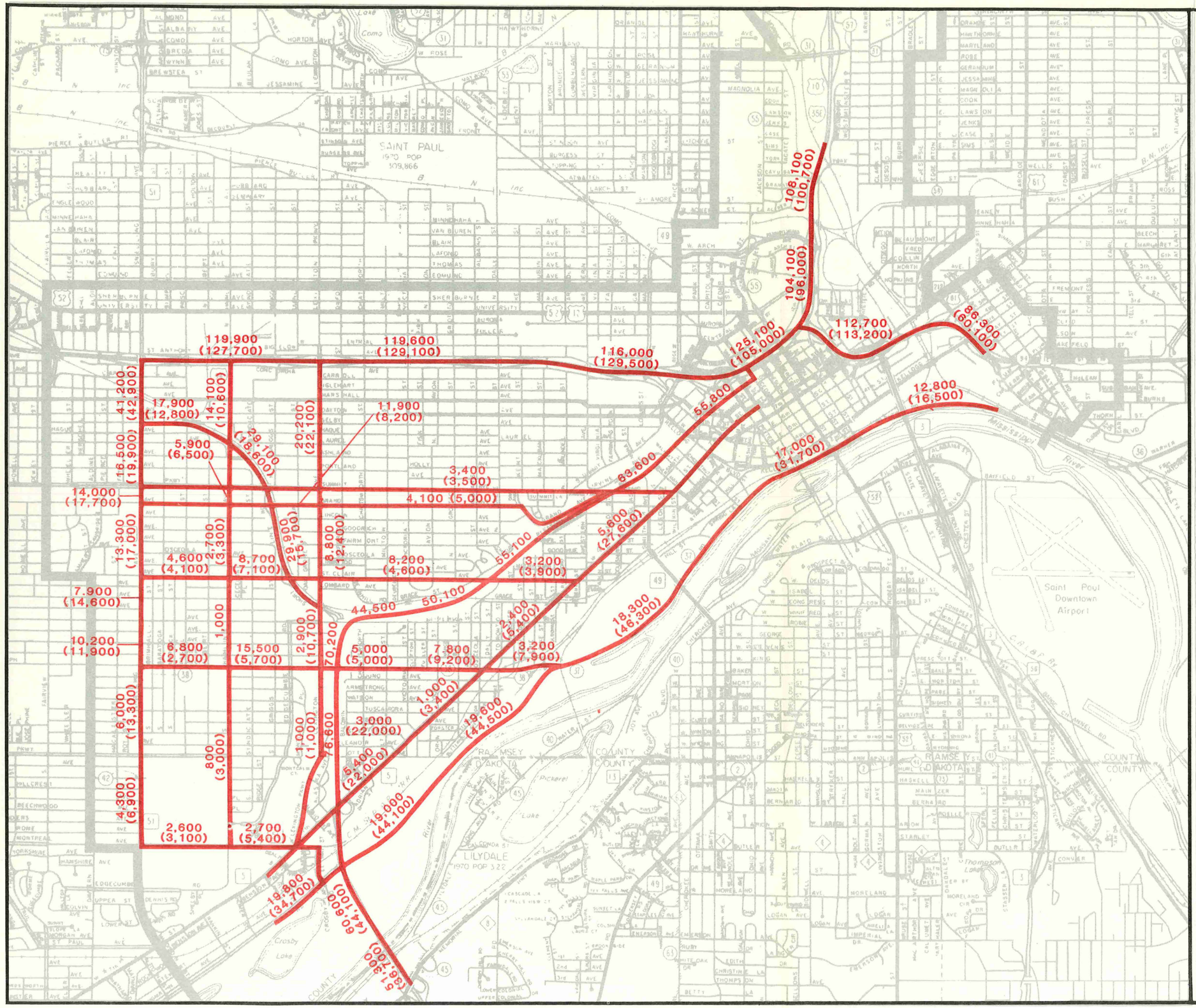
FIGURE 6

SELECTED AVERAGE DAILY TRAFFIC VOLUMES– YEAR 2000

ALTERNATIVE A
PLEASANT AVENUE
FREEWAY 100,000

ALTERNATIVE I
NO-BUILD (100,000)

(AS FORECASTED IN MARCH, 1979)



heading to downtown St. Paul, 13% continue on eastbound I-94. This means 47% desire to travel past downtown St. Paul. However, the vast majority of these trips are local in nature. The figure indicates only 8% of the northbound travelers desire to continue beyond the north study terminus at I-694/I-35E. The same figure shows that 41% of travelers northbound across the bridge desire to travel the Short Line to destinations in the Snelling/University Avenue area as well as for destinations westbound on I-94, to TH 280 and to downtown Minneapolis. The figure also shows that 22% of the northbound travelers at the bridge exit at Shepard Road and at West Seventh. Another 7% exit at Randolph. Thus, only 30% desire to travel north in the corridor past Randolph.

Of the 16% traveling past the CBD, most are destined for areas south of TH 36.

The preceding analysis shows that although there is a need for a roadway in the corridor to serve trips from residences north of West Seventh to the downtown St. Paul area, this roadway would not be used primarily for interstate-type travel. In fact, the majority of travelers crossing the Lexington Bridge, the facility most likely to carry interstate trips, desire to exit the roadway south of the Short Line.

DEFICIENCIES

There are a number of deficiencies in the transportation (principally highway) network in the Primary Impact Area. These may be summarized as follows:

Access from Residential Areas in SW St. Paul to the St. Paul CBD

Presently, there are only two routes which provide access to downtown St. Paul from the southwest portions of the city: West Seventh and Shepard Road. Shepard Road, because of its alignment adjacent to the river, serves the Airport/Fort Snelling/G.S.A. complex and the Highland area of St. Paul with the CBD and to points north and east of the CBD. Portions of West Seventh are currently operating near capacity during the p.m. peak hour. More importantly, however, there is strip commercial development along West Seventh, which creates potentially hazardous turning movements at mid-block locations. Additionally, there are many accident problem intersections: Montreal/Lexington, Randolph, St. Clair and Ramsey.

Access to Midway Area from Dakota County and Areas to the Southwest of the CBD

The Midway area of St. Paul is an important industrial center for the Twin Cities and for the City of St. Paul. Truck access and goods movement rate especially high in the list of priority needs for this area. At the same time, access to employment, services, shopping areas from the south is very important. Access to the Midway from the south, including northern Dakota County, and from southwest St. Paul has long been a problem requiring solution. There is a difficult

movement for trucks and cars from West Seventh to Montreal west to Snelling. Trucks are forced to make this movement to gain access to the Midway area since Snelling is the only north-south truck route in this area. Automobile drivers from south I-35E often use Lexington Avenue to drive northward to shopping and employment opportunities in the Midway area. This causes problems for residents along Lexington south of Grand, where the land use is largely residential.

Arterial Capacity in a North-South Direction

Continuous north-south arterial spacing in a built-up urban area is often provided on a spacing of one-half mile. However, between the St. Paul CBD and Snelling Avenue, some 3.6 miles to the west, Lexington is the only arterial providing continuous north-south connection.

Provision of Roadway Facilities for North-South Roadways to Bypass the CBD

Currently, traffic destined to northbound I-35E from the CBD must pass through the CBD, either on the edge or directly through it, in order to complete the trips. Ideally, travel in the CBD should be comprised of trips with one end (either origin or destination) in the CBD.

Connections Between Completed Freeway Segments South of the Mississippi River and Freeways North of the St. Paul CBD

There is a need to provide for trips between subregions of the metropolitan area continuously on high-type facilities. Currently, travel between the completed segment of I-35E must use either residential streets (Lexington) or routes through the CBD (via Shepard to Sibley to 11th and Jackson).

ECONOMIC DEVELOPMENT

The northern part of Dakota County, which includes the area to be served by construction of I-35E, is part of the Metropolitan Urban Service Area (MUSA). This area, largely undeveloped at this time, has been the object of planned urban development by the Metropolitan Council for the last several years. In support of this planned urbanization, there is a need to provide more balanced intra-regional highway facilities to connect the southern part of Ramsey County and the northeast part of Dakota County. The development of a large parcel of planned industrial land situated between TH 55 and TH 13 adjacent to the proposed alignment of I-494 in Dakota County has been delayed pending the resolution of freeway-type access in northern Dakota County. The completion of I-35E in this area as well as I-494 could, with completion of I-35E within the City of St. Paul, enable this planned development to proceed. Currently, many travelers in Dakota County are attracted to southern Hennepin County by the provision of I-35W and TH 77 (Cedar) and the absence of any competing roadways (such as I-35E) to serve Ramsey County. Under a no-build option, subsequent development in Dakota will tend to reinforce the suburban orientation toward Minneapolis.

The economic vitality of downtown St. Paul also depends upon the ability to provide a high degree of accessibility for all potential retail markets, including those in northern Dakota County. By relieving congestion along presently overcrowded roadways such as West Seventh from the Lexington Bridge to downtown St. Paul, as well as through the provision of additional roadway capacity, the accessibility of the downtown area could be enhanced. The enhanced accessibility would increase the attractiveness of the downtown area for shopping and entertainment. This is especially important in that the proposed regional shopping facilities to serve northern Dakota County have been dropped.

MODAL INTERRELATIONSHIPS

The completion of I-35E within the City of St. Paul would increase the accessibility between the downtown St. Paul area and the Twin Cities International Airport. This linkage, presently served by Shepard Road, would decrease the travel times to the airport for residents of northern Ramsey County by enabling them to bypass the downtown St. Paul area, through which travelers must currently travel in order to gain access to Shepard Road.

Express transit service to the downtown St. Paul area would be improved from southwest St. Paul and from northern Dakota County through provision of I-35E within St. Paul.

Although neither the freeway Alternatives A and A' in Pleasant Avenue nor Alternative B in Shepard Road include bikeway and pedestrian paths within planned rights-of-way, there are a number of bridges where future crossings could be made. These planned locations would not change the present situation along Pleasant Avenue, since the bridges at West Seventh, Randolph, Jefferson and St. Clair are already in place. The additional bridge proposed at Grand/Ramsey and Kellogg would not significantly alter walking and biking patterns.

The proposed Shepard Road freeway alternative would likely not interface well with the truck and barge terminal facilities along the river. In fact, some of these would be physically altered -- either moved or removed entirely. Additionally, a number of alternatives would cause some rail trackage to be moved, including those involving the usage of Shepard Road.

The Shepard Road alternative would be ineffective for improving transit service to the southwest residential areas of St. Paul.

II. ALTERNATIVES

CORRIDOR SELECTION PROCESS

Potential corridors were evaluated from a transportation perspective during Phase I of this study. This procedure was based on the premise that potential I-35E corridors, to be valid, must respond to a "high degree" to the federal, state, regional and local transportation goals, objectives and policies.

The "first-level" evaluation considered construction of I-35E as a freeway to full interstate design standards, in terms of established federal, state, metropolitan and local goals and policies. Corridors that met these goals and policies to a "high degree" were recommended for detailed social, economic and environmental analysis and evaluation in this Draft Environmental Impact Statement.

Seven potential I-35E corridors were identified, reflecting the basic routing options for I-35E between the study termini. They are located in Figure 7 and listed below:

a. Pleasant Avenue
b. Shepard Road
c. Lafayette Freeway (Trunk Highway 3)
d. Concord
e. Trunk Highway 61
f. I-494/I-694
g. Short Line/I-94

A set of "first-level" evaluation criteria was developed in response to the goals and policies of the Metropolitan Council's Regional Transportation Policy Plan. The study management team consulted federal, state and metropolitan agencies and local units of government directly affected by issues related to the proposed I-35E. Responses indicated, generally, that the Regional Transportation Policy Plan's goals and policies are appropriate to judge the merits of the seven potential corridors for routing I-35E.

I-35E corridor evaluation criteria for Phase I are listed below:

1. Relative cost to design and construct facility.
2. Degree of truck accessibility within subregions.
3. Degree of interregional truck accessibility between regions.
4. Degree of support provided to land use development of metropolitan significance.
5. Degree of compatibility within one-half mile of the proposed alignment with existing and planned land use development.
6. Extent to which the proposed alignment would limit or discourage through traffic in neighborhoods.
7. Degree to which the proposed alignment would provide a reduced travel time for public and multi-passenger transit from any part of the City of St. Paul, northern Dakota County, and northwestern Dakota County, to the St. Paul Central Business District (CBD).

8. Degree to which the proposed alignment would provide a reduced travel time from any part of rural Dakota County to the St. Paul CBD.
9. Extent of probable design and right-of-way problems in ensuring adequate accessibility to St. Paul CBD and adjacent fringe parking.
10. Degree to which the proposed alignment could efficiently accommodate projected intrastate travel.

A point range of one to five for each criterion listed above was used in the evaluation of the potential I-35E corridors. The better a corridor complied with a specific criterion, the higher the number of points assigned. The final scores were then grouped as "high," "medium" or "low."

Evaluation results were that Pleasant Avenue and Shepard Road had scores in the "high" range, with 66 and 55 points respectively. Lafayette freeway (TH 3) and Short Line/I-94 had "medium range" scores of 42 and 39 respectively. Concord Corridor, Trunk Highway 61 and I-494/694 had "low range" scores of 32, 28 and 24 respectively.

Based on evaluation results, it was concluded that only two of the seven corridors merited more detailed evaluation as part of an EIS. These are the Pleasant Avenue corridor (Alternate A) and the Shepard Road corridor (Alternate B).

These two corridors were expanded into twelve alternatives. All of these twelve alternatives are presently under consideration. Selection of the final alternative will be made only after the public hearing transcript and comments on the Draft EIS have been evaluated.

DESCRIPTION OF THE ALTERNATIVES

A total of twelve alternatives were developed within the two selected corridors. They are presented graphically in Figure 8 and in greater detail in Appendix A. Major distinctive features between alternatives include: parkway or freeway designation, direct or indirect connection to I-94, and the relationship to the existing Short Line Road.

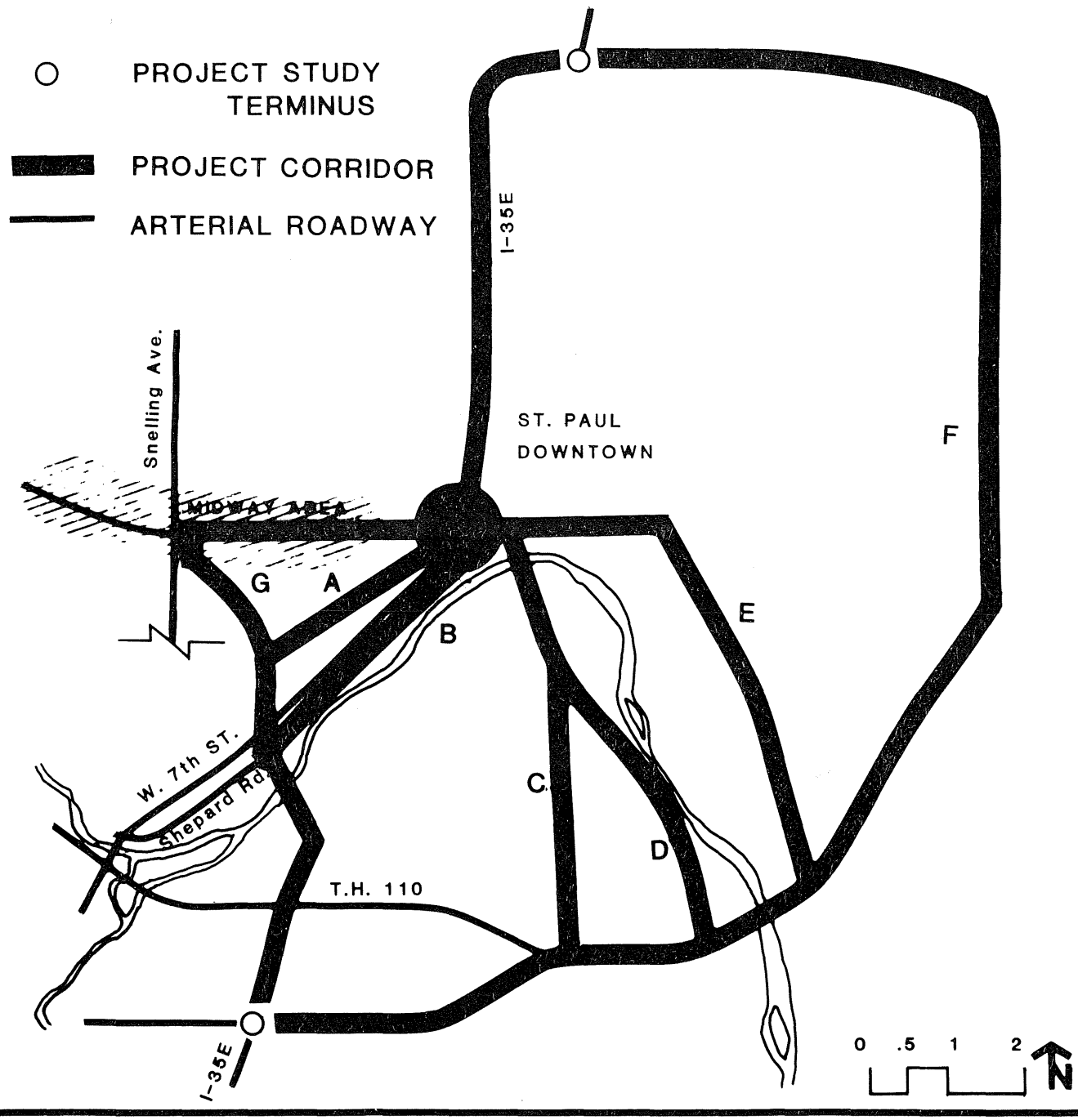
Parkway and Indirect Connection Definitions

The parkway and indirect connection design features are important elements to many of the alternatives. Public input was an important factor in the development of both the definitions. "Parkway" as used in all parkway alternatives in the I-35E Environmental Impact Statement will be taken to mean:

- A four-lane facility with a raised median, extra lanes provided for merging and diverging where necessary, with complete access control.

- Posted speed lower than 55 mph.

- Trucks prohibited from the facility.



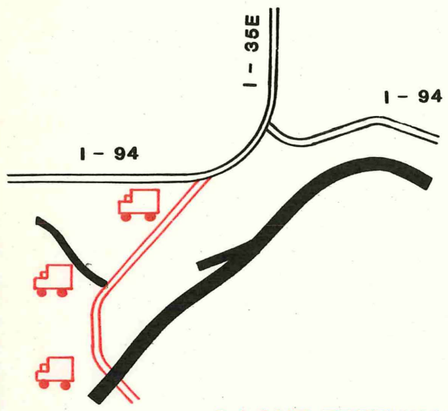
I-35E CORRIDORS IDENTIFIED

(A) Pleasant Avenue
(B) Shepard Road
(C) T.H. 3 - Lafayette Freeway
(D) Concord
(E) T.H. 61
(F) I-494/I-694
(G) Short Line/I-94

FIGURE 7

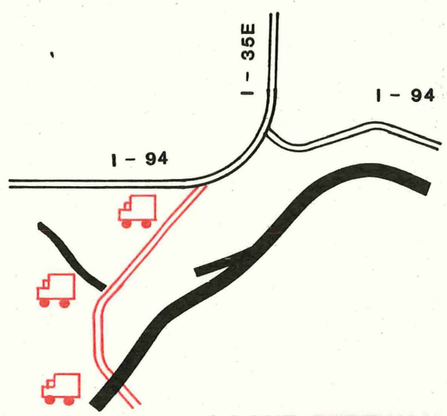
POTENTIAL I-35E CORRIDORS IDENTIFIED IN PHASE 1

A



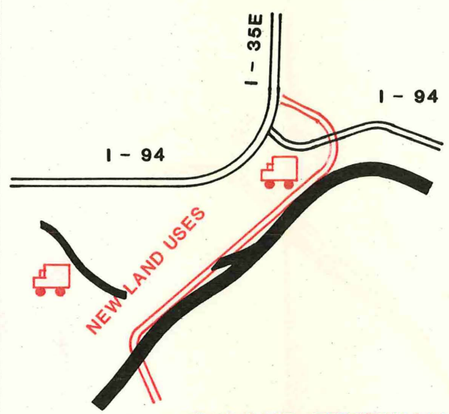
6 LANE FREEWAY

A'



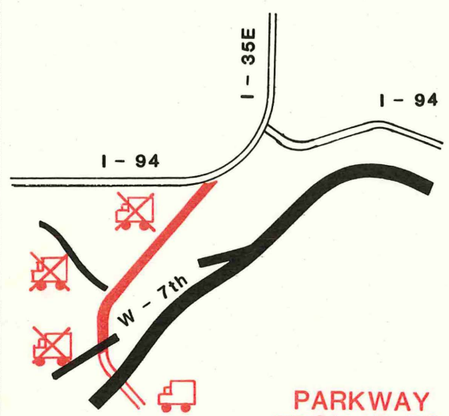
4 LANE FREEWAY

B



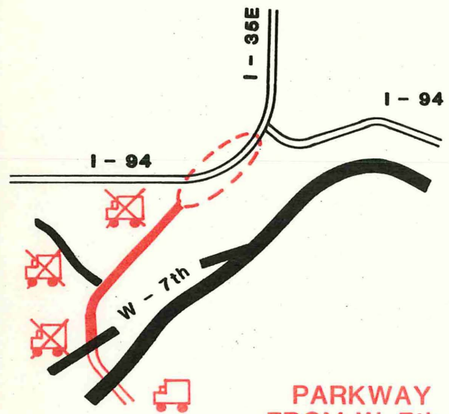
6 LANE FREEWAY

C



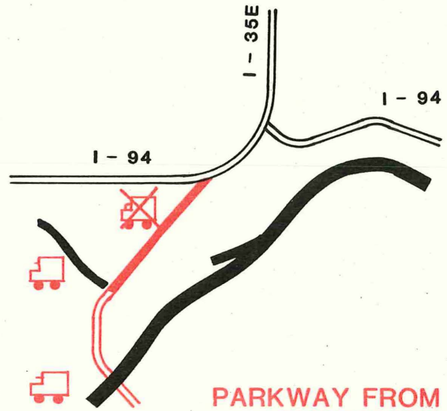
PARKWAY FROM W-7th

D



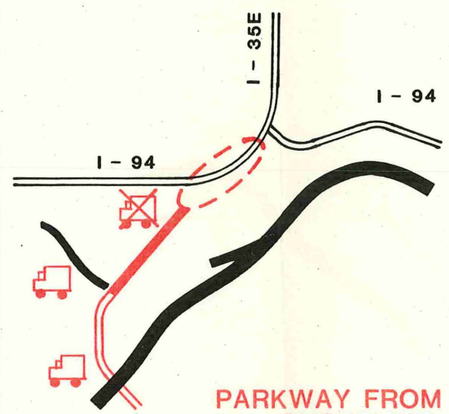
PARKWAY FROM W-7th

E



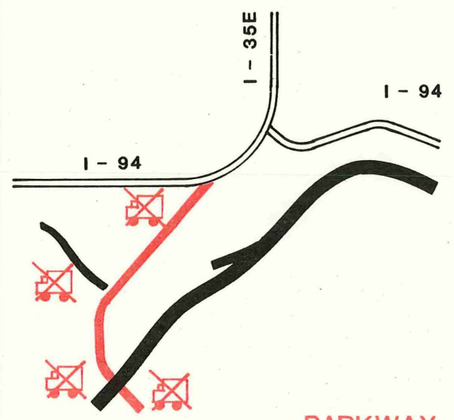
PARKWAY FROM SHORTLINE

F



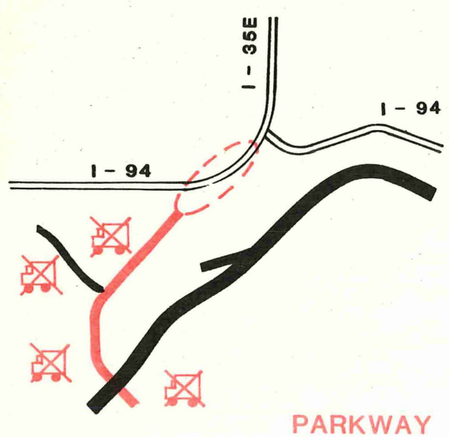
PARKWAY FROM SHORTLINE

G



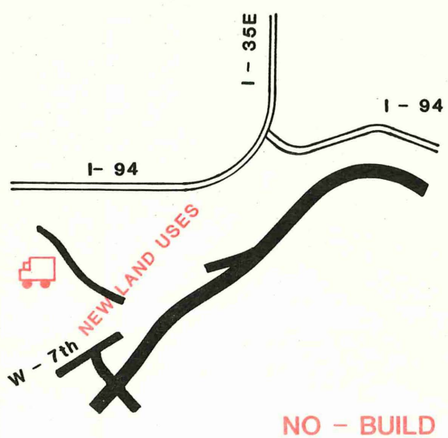
PARKWAY

H



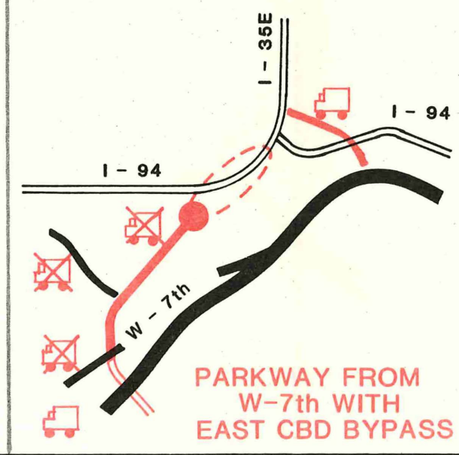
PARKWAY

I



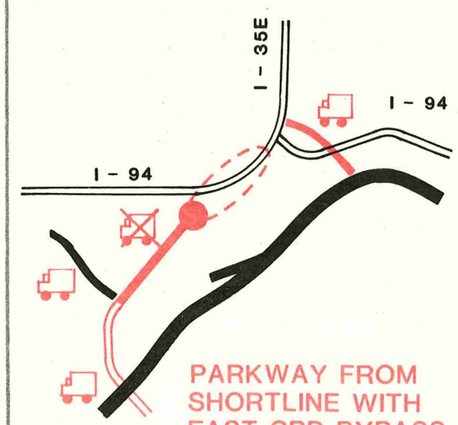
NO - BUILD

J



PARKWAY FROM W-7th WITH EAST CBD BYPASS

K



PARKWAY FROM SHORTLINE WITH EAST CBD BYPASS

FIGURE 8

I - 35E ALTERNATIVES

FREEWAY

PARKWAY OR ARTERIAL

TRUCKS ALLOWED

NO TRUCKS

DIRECT CONNECTION

INDIRECT CONNECTION

AT GRADE INTERSECTION

I35E

- Extensive landscaping provided in the median, at the roadside, and in the adjacent right-of-way.

- There will be no at-grade intersections except where indicated in Alternatives J and K. All access points will be interchanges.

An indirect connection included as an element of Alternatives D, F, H, J and K will be taken to mean:

- Construction of a four-lane facility with no median from the Grand/Ramsey interchange to Fifth and Sixth streets.

- Grade-separated interchanges at Grand/Ramsey and Kellogg.

- Traffic would be routed on Eleventh and Twelfth streets, adjacent to the existing I-94 Common Section. At-grade intersections would be located at: St. Peter, Wabasha, Cedar, Minnesota, Robert and Jackson.

- Access to Eleventh Street east-/northbound would be provided in the area of St. Peter Street by means of a ramp-type roadway. Access to Twelfth Street west-/southbound would be provided in the area of Arch Street by using the existing University Avenue exit ramp. The connection to the new segment of I-35E would be gained by a ramp in the area of Twelfth Street and Wabasha.

- Under alternatives J and K, the Fifth/Sixth Street connector from I-94 would intersect I-35E at grade. This modification was included to further reduce the convenience of using this route for through traffic in the Pleasant Avenue corridor.

A direct connection, by contrast, would merge I-35E directly into the mainlines of existing I-94 and provide exit and entrance ramps at Eleventh and Twelfth streets.

Short Line Road

The scope of the DEIS has been expanded to include impacts on the Short Line Road area, since this roadway will be affected by selection of an I-35E alternate. Short Line Road currently provides automobile access from southwest St. Paul to the Midway area. Trucks are prohibited from the roadway, but it nevertheless is used by some truckers.

Various I-35E alternates propose that trucks also be allowed to use Short Line Road to provide direct access to the Midway area from northern Dakota County and southwest St. Paul. Traffic, air quality and noise analysis were performed for the Short Line Road as part of the DEIS.

East CBD Bypass

In an effort to provide truck service from northern Dakota County to the CBD and beyond, while reducing adverse impacts such as noise,

two alternatives (J and K) include a new East CBD Bypass in conjuction with the existing Shepard Road.

Specific descriptions of the alternatives follow.

Alternate A

A six-lane freeway in the Pleasant Avenue corridor beginning at West Seventh Street. This facility would have a direct connection to I-94. Trucks could use this facility and would be permitted to use Short Line Road. There would be no changes made to Shepard Road.

Alternate A'

A four-lane freeway in the Pleasant Avenue corridor beginning at West Seventh Street with a direct connection with I-94. Trucks would use this facility and Short Line Road. There would be no change in Shepard Road.

Alternate B

A freeway in the Shepard Road corridor beginning at the Lexington Avenue Bridge with a direct connection to I-94. Trucks would use this facility and Short Line Road. There would be no roadway construction in the Pleasant Avenue corridor and therefore no access from I-35E to Short Line Road except by use of location streets. The existing Pleasant Avenue right-of-way would be utilized for housing, parks, trails and a limited amount of business activity.

Alternate C

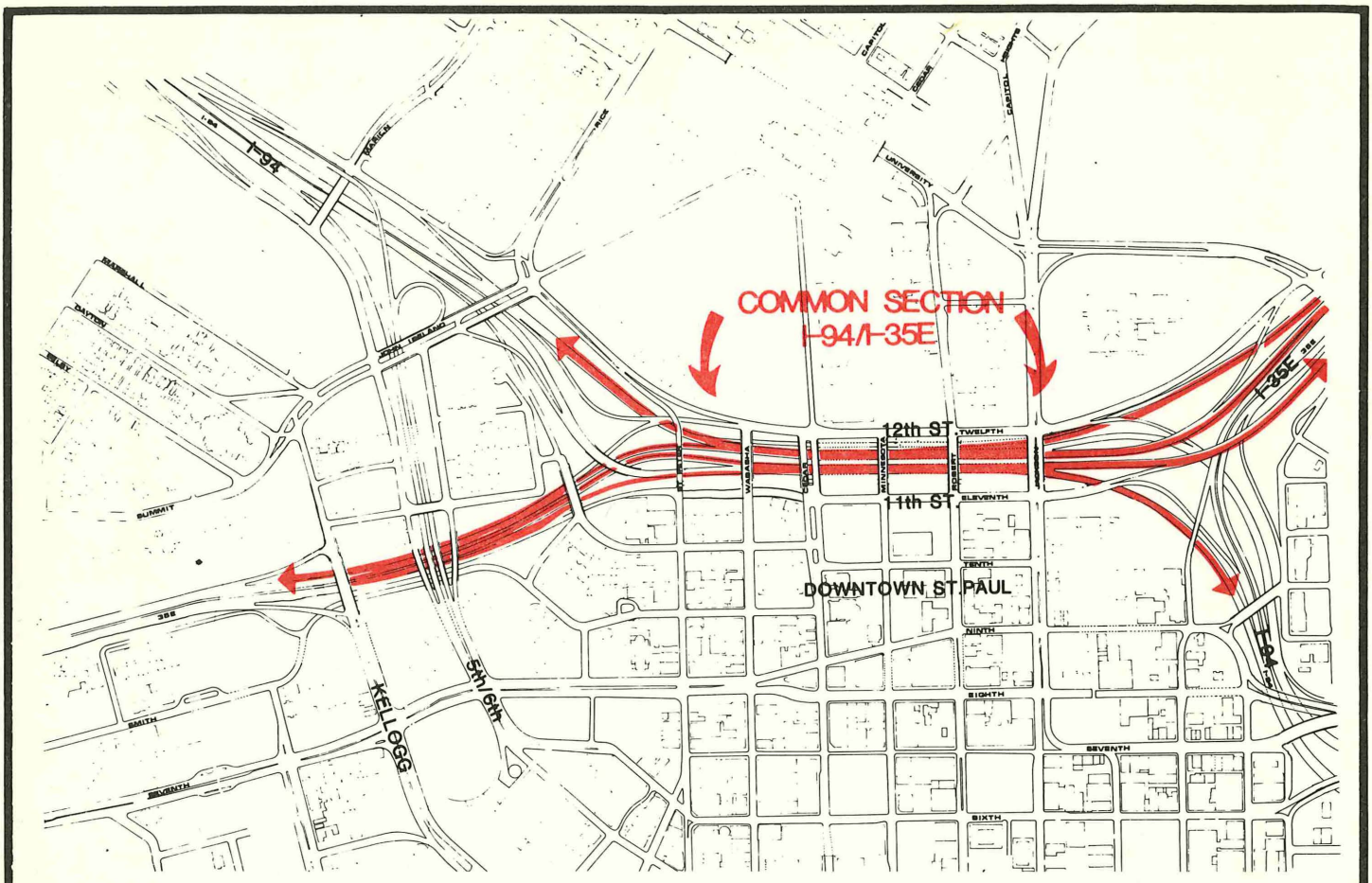
A parkway in the Pleasant Avenue corridor from West Seventh Street to downtown St. Paul with a direct connection to I-94. The roadway would be composed of six lanes from West Seventh to the interchange with Short Line Road and four lanes for the remaining distance. Trucks would be prohibited from this facility and Short Line Road. There would be no change in Shepard Road.

Alternate D

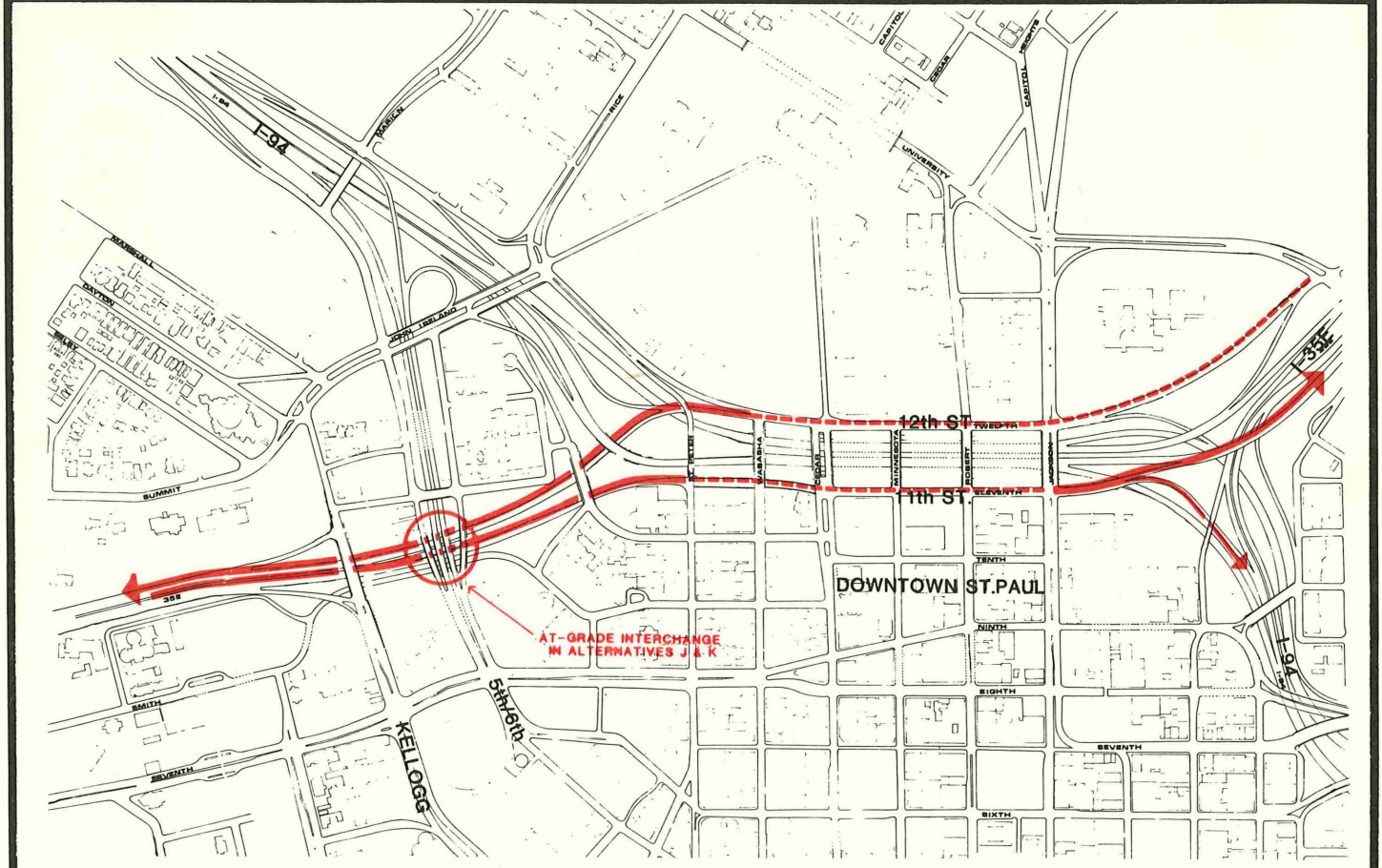
A parkway in the Pleasant Avenue corridor from West Seventh Street to downtown St. Paul, with an indirect connection to I-94. The roadway would be composed of six lanes from West Seventh to the interchange with Short Line Road and four lanes for the remaining distance. Trucks would be prohibited from this facility and Short Line Road. There would be no change in Shepard Road.

Alternate E

A six-lane freeway from West Seventh Street to Short Line Road. A four-lane parkway in the Pleasant Avenue corridor from Short Line Road to downtown St. Paul, with a direct connection to I-94. Trucks would be permitted to use the freeway section of this facility and Short Line Road. There would be no change in Shepard Road.



DIRECT CONNECTION



INDIRECT CONNECTION

FIGURE 9 **135E**

Alternate F

A six-lane freeway from West Seventh Street to Short Line Road. A four-lane parkway from Short Line Road to downtown St. Paul, with an indirect connection to I-94. Trucks would be permitted on the freeway section of this facility and Short Line Road. There would be no change in Shepard Road.

Alternate G

A parkway from I-494 to downtown St. Paul with a direct connection to I-94. Trucks would be prohibited from this facility and Short Line Road. The section constructed from I-494 to TH 110 would be constructed as planned. Six lanes would be provided from West Seventh to the interchange with Short Line Road. Four lanes would be provided for the remaining distance. There would be no change in Shepard Road.

Alternate H

Parkway from I-494 to downtown St. Paul with an indirect connection at I-94. Trucks would be prohibited from this facility and Short Line Road. The section constructed from I-494 to TH 110 would be constructed as planned. Six lanes would be provided from West Seventh to the interchange with Short Line Road. Four lanes would be provided for the remaining distance. There would be no change in Shepard Road.

Alternate I

"No-Build." Assumes no further construction from West Seventh Street to downtown St. Paul. Use of the Short Line will continue as it is at present. Trucks use the road, even though this is not a truck route. In order to assess no-build impacts, it was necessary to create a land use scenario for the Pleasant Avenue corridor for the "No-Build" and "B" Alternatives. This was developed by the City of St. Paul, Department of Planning and Economic Development. The proposed land uses for the Pleasant Avenue corridor under these alternates include single-family and multi-family residential as well as commercial/office use and passive and active open space. The locations fo these uses are illustrated in Appendix A. Should this corridor not be selected, the previously acquired right-of-way would be available for alternative development. Also included in the evaluation of the "no-build" alternative will be improvements to the I-35E/I-94 Common Section, which will be constructed with or without the St. Paul link of I-35E.

Alternate J

A parkway from West Seventh to downtown St. Paul in the Pleasant Avenue corridor, with an indirect connection to I-94. Trucks would not be able to use Short Line Road. A bypass would be constructed around the St. Paul CBD from Shepard Road to the Arch/Pennsylvania interchange with I-35E.

Alternate K

A freeway would be built from West Seventh Street to Short Line Road. A parkway would be provided in the Pleasant Avenue corridor from Short Line Road to downtown St. Paul with an indirect connection to I-94. Trucks would be permitted on the freeway and Short Line Road. A CBD bypass would be constructed from Shepard Road to the Arch/Pennsylvania intersection with I-35E.

Transportation System Management (TSM) Alternative

This report contains consideration of TSM measures relating to transportation and energy as they affect all alternatives, including the no-build. In all other impact areas, the TSM alternative impacts are the same as the no-build. TSM measures are official policy of the Metropolitan Council and the City of St. Paul. As such, the system efficiencies that can be achieved by these measures have already been implemented to a major degree. Those remaining capacity improvement possibilities cannot adequately cope with the forecast demands, nor will they cause significant reductions in energy demand.

COSTS

Costs for construction, additional right-of-way, engineering, contingencies and noise abatement are available in Table 1.

TABLE 1
ESTIMATED COSTS FOR I-35E ALTERNATIVES - (1980 DOLLARS)

Alternate	Pleasant Avenue W7th-I-94	Common Section	Shepard Road	East Side CBD Bypass	Total
A	$37,100,000	$14,100,000			$ 51,200,000
A'	34,600,000	14,100,000			48,700,000
B			$238,800,000		238,800,000
C	36,900,000	14,100,000			51,000,000
D	36,400,000				36,400,000
E	36,900,000	14,100,000			51,000,000
F	36,400,000				36,400,000
G	36,900,000	14,100,000			51,000,000
H	36,400,000				36,400,000
I					0
J	31,300,000			19,400,000	50,700,000
K	31,300,000			19,400,000	50,700,000

Notes:

1. A separate programmed project for I-94 is planned which involves replacing the I-94 Sixth Street Bridges and other remodeling to provide three-lane continuity from Louis-Marion through Mounds Boulevard. This project is related to but not dependent upon I-35E alternatives.

2. Shepard Road cost include $177,800,000 for construction, and right-of-way acquisition costs and relocation costs of $27,400,000 and $800,000 respectively. Total includes 3% Preliminary Engineering and 15% Construction Engineering and Contingencies ($6,100,000 and $26,700,000 respectively).

3. No costs for Short Line improvements are included in any of the alternates.

4. No costs for noise abatement are included in any of the alternates.

5. To date, $25,000,000 have been spent on right-of-way and construction in the Pleasant Avenue corridor. Inflating these expenditures to 1980 dollars using the construction cost index, indicates that this expenditure represents about $54,300,000 in 1980.

SIGNIFICANT IMPACTS

Of all the impact areas discussed in the Draft EIS, ten are considered of major significance toward reaching a selected alternative based on five criteria:

1. Impact in an area of major regulatory concern,
2. A major contributor to cost,
3. Major environmental impact or violation of a standard, or
4. Major difference between alternatives.
5. Significant contributor to meeting project needs.

The significant impacts discussed below are presented in their order of appearance in the later sections. They are not presented in an order of value or significance. A matrix of significant impacts is presented in Table 2. The significance of each impact is relative to existing conditions.

Floodplain

Alternative B would longitudinally encroach upon 370 acres of the Mississippi floodplain. This encroachment is expected to increase scour of the river bottom, aggravating serious problems with the Robert Street Bridge and several utility crossings. The freeway would also require relocation and disruption of navigation courses and docking facilities. Alternative B is probably a significant encroachment under the definition of "significant" in paragraph 4q. of F.H.P.M. 6-7-3-2. Although Alternatives J and K encroach slightly upon the floodplain, they will produce no significant adverse impacts. No other alternative will have any floodplain impacts. Problems with floodplain construction would add major costs to Alternative B, and cannot be entirely mitigated.

Noise

As in any urban transportation project, noise is a major issue. Minnesota's Pollution Control Agency (PCA) has noise standards which are more strict than FHWA noise design levels. Nighttime standards are especially stringent. Noise levels would exceed PCA's daytime standards at some locations and their nighttime standards at all locations, in all alternatives, without abatement. The presence or absence of trucks on various segments makes a significant difference between alternatives for FHWA design levels, but not for the more stringent PCA daytime standards, which are most affected by traffic volume and speed. Mitigation is feasible for meeting PCA daytime standards, using noise barriers, natural relief, roadway depressions and limited architectural modifications. The limitation of daytime noise level increases to 10 dBA or less above existing conditions is feasible with mitigation for all alternatives except for 17 receptors along Alternatives A and A'. Only the alternatives with major parkway segments (Alternates C, D, G, H) can feasibly mitigate nighttime impacts within the corridors to meet PCA's nighttime standard. It does not appear feasible to meet PCA nighttime standards for off

corridor receptors for any alternative (including no-build), although prohibiting trucks on the Short Line will decrease adverse impact.

Goods Movement

The freeway alternates provide a high level of service for all trucking movements in the corridor, the most important of which is access to the downtown area and the Midway district. Restrictions on goods movement become more severe as the length of the parkway is extended west of the downtown. Alternates G and H which prohibit trucks on I-35E north of I-494 severely retards goods movement to and from St. Paul.

Level of Service

The level of service in the corridor is improved with all alternates except the no-build option. The indirect connection options tend to increase the levels of service on 35E to a greater degree due primarily to the reduced amount of travel assigned to the route. Alternates B, J and K would cause the least amount of congestion in the Common Section of I-94 and I-35E. All build alternatives would be an improvement to the level of service in the Common Section when compared to the no-build. The Common Section is assumed to be rebuilt with any alternate having a direct connection, but does not have to be rebuilt for the indirect connection alternatives. The changes in Common Section levels of service are partially due to reduced volumes, particularly with Alternates B, J and K.

Regional Accessibility

All build alternates are consistent with the Regional Policy Plan for transportation. I-35E is identified as a Principal Arterial in the corridor southwest of the St. Paul downtown area. The alternates having direct connections to I-94 rate higher because they provide direct high level of service between I-35E and other Principal Arterials (I-94) in the Policy Plan network.

Economic Development Stimulation

This is a major positive impact of the proposed project. Because of the similarity of the build alternatives, their impact is indistinguishable from a city or regional perspective. But, any build alternative has major benefits when compared to the No-Build Alternate. These benefits include:

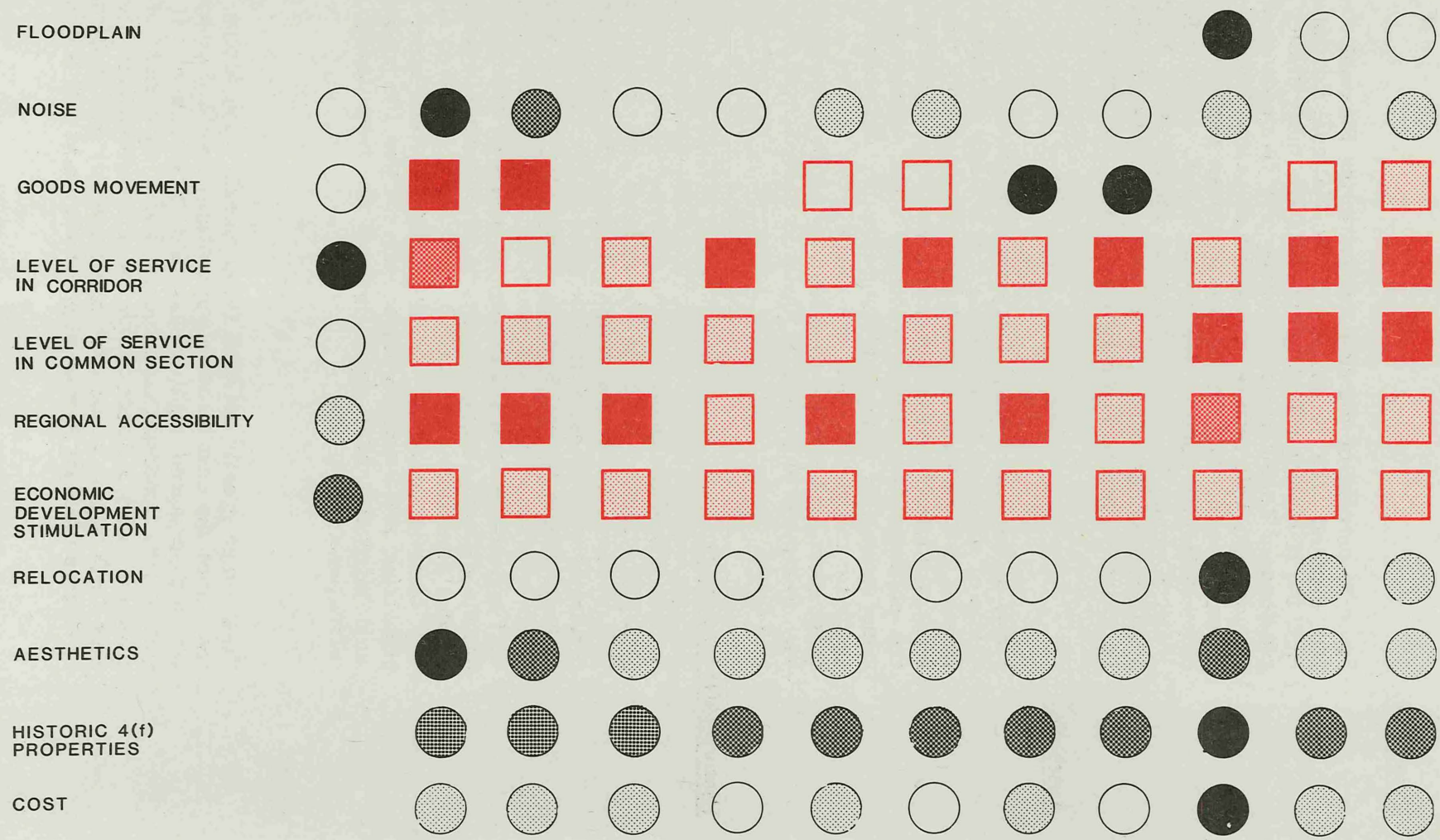
1. Short- and long-term growth for the city center (a major goal of the City of St. Paul and the Metropolitan Council) instead of the gradual shift to competing peripheral centers which is likely to occur with a no-build alternate.

2. Major, planned development in northeast Dakota County, thus creating a greater market for city center merchants.

3. Induced development and urban infilling in a variety of downtown peripheral areas.

TABLE 2

ALTERNATE	I	A	A[1]	C	D	E	F	G	H	E	J	K
LOCATION	NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY		FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION		DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY				W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD



ALL IMPACTS ARE COMPARED TO EXISTING CONDITIONS — BENEFICIAL IMPACT — NO IMPACT — ADVERSE IMPACT

SIGNIFICANT IMPACTS

BEST — WORST

Relocation

Since 95 percent of the right-of-way in the Pleasant Avenue corridor was acquired prior to passage of the National Environmental Policy Act, the remaining relocation impacts are much smaller than those of the Shepard Road corridor, involving only five houses. Shepard Road, by contrast, will require relocation of nearly 450 employees, 65 of whom are minority, handicapped or transit dependent; industrial and business facilities and 12 low income homes. Impacts for Alternatives J and K would be similar to those for Pleasant Avenue, with the additional relocation of 10 employees and a small number of industrial facilities. Relocation adds substantially to the cost of Alternative B.

Aesthetics

Views of the road were primary concerns contributing to the determination of the need for this EIS. It is a major difference between the freeway and parkway alternatives. Although both would have grade separated interchanges, landscaping would be much more extensive in the parkway alternatives, reducing visual intrusion and improving visual transition and integration into the neighborhoods. Parkway aesthetic mitigation costs are roughly two to five and a half times those costs for aesthetic treatment on normal urban freeways. Parkway treatment might add $150,000 to $750,000 per mile to construction costs.

Historic/4(f) Properties

Section 4(f) of the Department of Transportation Act of 1966 requires a special effort to avoid use of parklands and historic sites. Another law, Section 106 of the Natural Historic Preservation Act of 1966 requires impact assessment of all sites which are listed, or eligible for inclusion in the Natural Register of Historic Places. With one regional 4(f) recreation property and seven major 4(f)/Section 106 properties as well as seven Section 106 properties indirectly affected, Alternative B has the greatest adverse impacts on these special properties. Pleasant Avenue alternates (A, A', C, D, E, F, G, H, J and K) also impact one 4(f) historic property, directly impact two other Section 106 properties, and indirectly impact one Section 106 property. Thus, all build alternates have major impacts on these special historic and recreational properties.

Costs

Costs range greatly between the proposals, with Alternative B nearly five times the cost of other alternates. This is primarily due to the yet-to-be-acquired right-of-way and construction difficulties associated with floodplain construction and a tight right-of-way. Those alternates with a direct connection and Alternatives J and K with the East CBD Bypass would cost approximately $50 million. Indirectly-connected Pleasant Avenue alternatives would cost $36 million.

III. AFFECTED ENVIRONMENT

This section describes present conditions under three separate headings: Physical, Natural and Cultural Environments.

PHYSICAL ENVIRONMENT

Geology

The Minneapolis-St. Paul Metropolitan Area lies within the Western Lake section of the Central Lowlands geomorphic province. Its sedimentary bedrock forms a shallow structural basin. The lowest part of the basin is at the intersection of the Mississippi River and the city limits of Minneapolis and St. Paul west of the primary impact area boundary. The bedrock dips toward the center of the basin on the average of 20 feet per mile.

Figure 10 contains cross sections which show the stratigraphic relationships of these geologic units. The locations of these cross sections are identified in Figure 11. The Prairie du Chien group underlies the entire primary impact area. Several deep valleys have been cut through the overlying bedrock into the Prairie du Chien. The Shepard Road corridor runs through two of these valleys. The Pleasant Avenue corridor lies along or just below the contact between the Platteville Limestone and Decorah Shale for its entire length.

Cyclic advance and retreat of glaciers, the greater flow of water in major river channels during glacial melt, modern erosion and deposition, and placement by man are the major forces which created the surface features of the study area.

Soils in the Mississippi floodplain consist of variable alluvial deposits, with peaty soils filling the depressions. Figure 11 illustrates the soil types found in the two corridor areas.

Climate

The prevailing winds are from the northwest in the winter and from the southeast in the summer. Lower wind speeds are more frequent at night occurring at less than 8 mph from 40 to 50 percent of the time. The prevailing direction of winds of less than 8 mph is southwest in the winter and southeast in the summer. The topography present in the river valley and the higher terraces encourages mixing of air and improved dispersion of airborne pollutants.

Climatological data shows that the coldest month is January, with mean daily maximum and minimum temperatures of 22.4 and 2.3 degrees (^{O}F). The warmest month is July, with mean daily maximum and minimum temperatures of 83.9 and 60.7 degrees.

The average annual precipitation in the project area is 29 to 30 inches. (Included in this figure is an average annual snowfall of 40.3 inches). June is the wettest month, with 4.2 to 4.4 inches of precipitation, and

January the driest, with one inch. Sixty-five percent of the average annual precipitation occurs from May to September. Average annual pan evaporation potential exceeds precipitation by 37%.

Hydrology

Over half of the Pleasant Avenue corridor has been graded in anticipation of future paving. In graded areas, lateral and trunk drainage systems have been installed which drain the entire freeway corridor and some small adjacent areas. In the northeastern third of the Pleasant Avenue corridor, grading operations have not been completed and lateral storm sewer systems have not been constructed. However, a trunk tunnel has been constructed which will ultimately receive discharges from lateral storm sewer systems in this section of the freeway corridor. Watersheds which are affected by, or include, the Pleasant Avenue corridor are completely urbanized and existing drainage conditions represent ultimate drainage conditions, except for development of the corridor. These watersheds include the Kittsondale, St. Peter, Trout Brook, and Phalen Creek Systems. These watersheds can be seen in Figure 12. Runoff from the Pleasant Avenue corridor would enter the Mississippi at the I-35E Bridge, and at the end of the Kittsondale and St. Peter tunnels.

The Shepard Road corridor is presently developed as a transportation corridor. Existing storm sewers cross Shepard Road at several locations. Drainage from the Shepard Road corridor is now conducted to the Mississippi River by these storm sewers or by small storm sewers which serve the adjacent roadway watershed only (see Figure 12). (Note: A full discussion of the Mississippi River is presented in the Environmental Consequences section.)

Groundwater

The St. Paul area is underlain by several bedrock aquifers. These are, in order of their use and development: the Prairie du Chien-Jordan, the deeper Mt. Simon-Hinckley and Ironton-Galesville formations and the shallower St. Peter and Platteville aquifers. The cross sections (Figure 10) show the areas where several of these water-bearing formations underly glacial soils in the corridors.

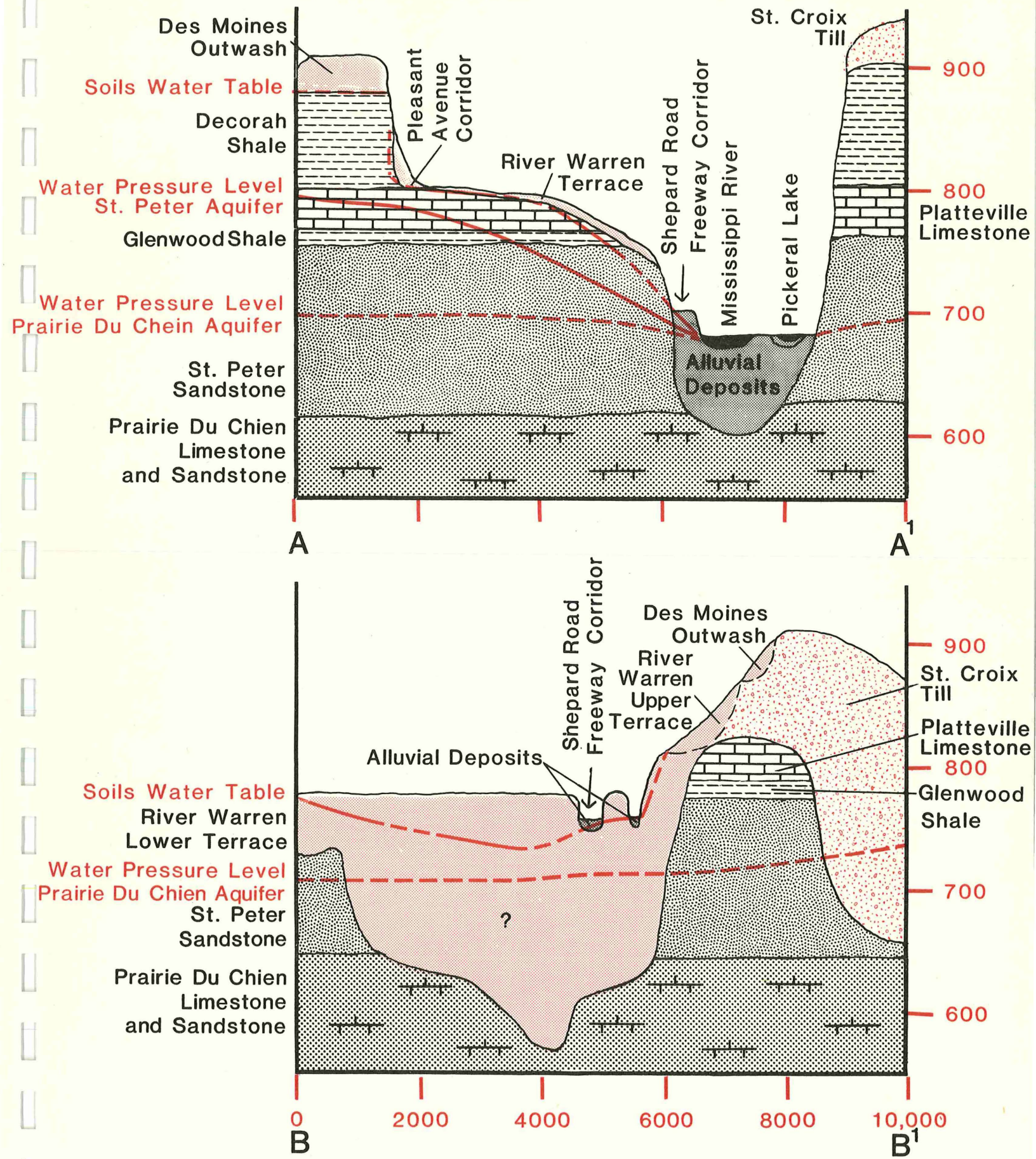
The Mississippi River is the major groundwater discharge for all aquifers above and including the Prairie du Chien-Jordan aquifer. All groundwater in the primary impact area flows toward the Mississippi River. (See Figure 12.) Groundwater gradients for the glacial soils as well as the St. Peter and Prairie Du Chien aquifers are shown in the cross sections in Figure 10.

Water Quality

The quality of the Mississippi River has been monitored since the early 1930s. Data for this analysis was collected at the sampling station located at River Mile 839.1 which is located at the downstream limit of potential runoff impacts from both the Pleasant Avenue and Shepard Road corridors. As presented in Table 3, several parameters

FIGURE 10

GEOLOGICAL CROSS SECTIONS



Locations of cross sections are presented in figure 11

FIGURE 11

SOILS MAP

A-A1	CROSS SECTION LOCATIONS
A	MISSISSIPPI ALLUVIAL DEPOSITS
W	GLACIAL RIVER WARREN DEPOSITS
BL	BOULDERS AND LIMESTONE
B	FILLED BOGS AND MARSHES
AF	ARTIFICIAL FILL
D	DES MOINES SANDY OUTWASH
S	ST. CROIX GLACIAL TILL
DD	GLACIAL DRAINAGEWAY DEPOSITS
R	BEDROCK OUTCROP
C	COLLUVIUM (SOILS DEPOSITED AT THE BASE OF STEEP SLOPES)

0 2000 4000 8000 Feet

I35E

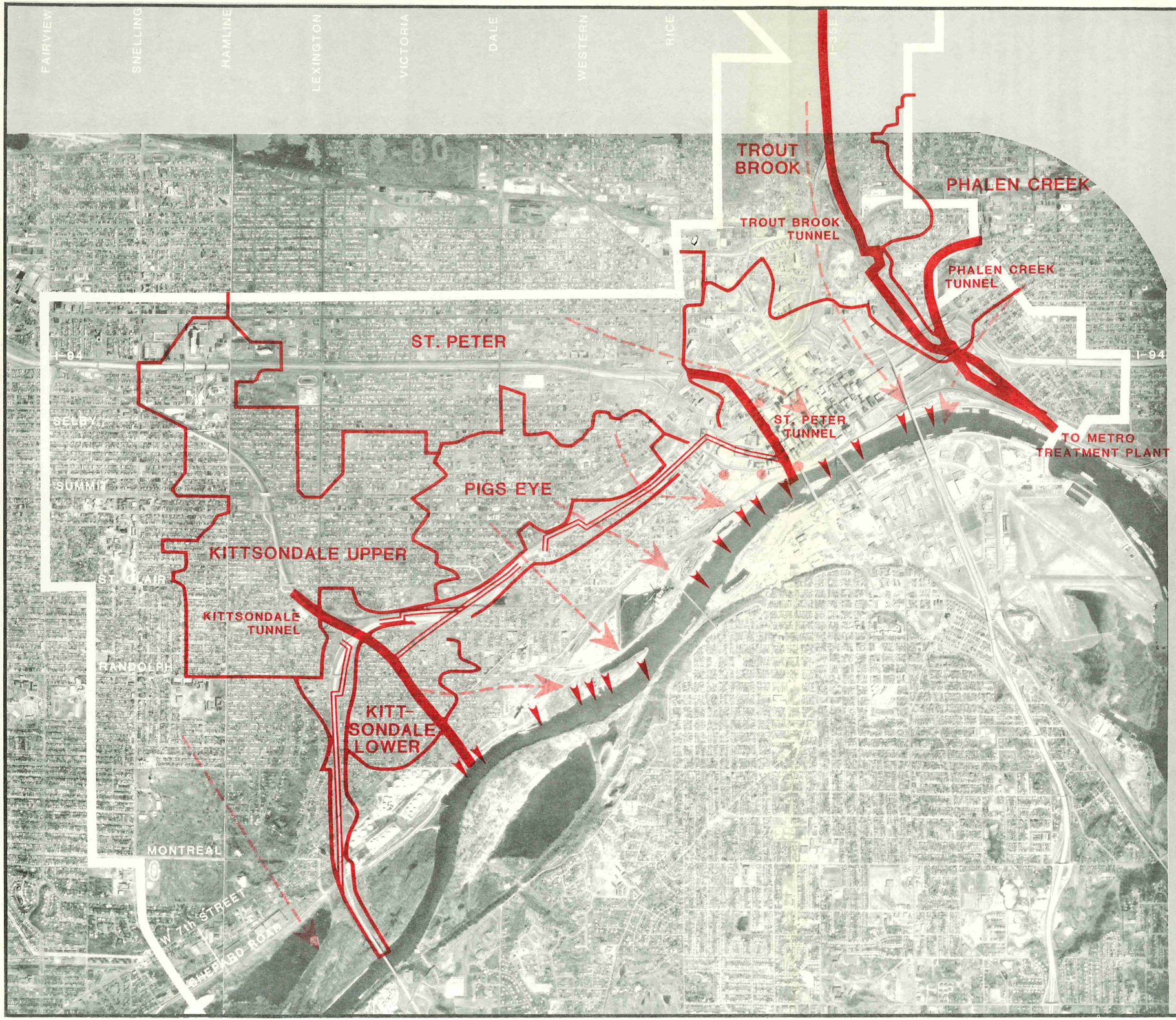


FIGURE 12

SURFACE AND GROUNDWATER DRAINAGE

- MAJOR WATERSHED BOUNDARY
- MAIN STORM WATER TUNNEL
- STORM SEWER
- SHEPARD ROAD FREEWAY DRAINAGE
- GROUNDWATER FLOW DIRECTION
- WELLS IN TOP BEDROCK AQUIFER

N

0 2000 4000 8000 Feet

I35E

exceeded the present Minnesota Pollution Control Agency (MPCA) water quality standards. Also shown is the frequency of the exceeded standards, based on all available data.

Table 3 - Mississippi River Violations of MPCA Water Quality Regulations.

Parameter	Standard	Frequency
Dissolved Oxygen	Not less then 6 mg/l April 1 - May 31. Not less than 5 mg/l other times.	Frequently, during summer months
Turbidity	25 J.T.U.	Regularly, during spring and summer months, especially during snowmelt and major storm runoff
Fecal coliform	200 most probable number per 100 ml.	Regularly, during spring and summer months, especially during snowmelt and major storm runoff when urban areas are washed and combined sewers overflow
Ammonic	1 mg/l	December 1976 (during low flow). Violation less than 5% of the time
Oil and grease	0.5 mg/l	Regularly during winter and spring months. Usually associated with snowmelt.
Hardness	250 mg/l	Exceeded periodically, many other values near or at standards.
Selenium	0.01 ug/l	Once
Lead	0.05 ug/l	May 1974, May and August 1978
Cadmium	0.01 ug/l	August 1978
Phenol	0.01 ug/l	Three times in six years
Bicarbonate	5 meq/l	December 1976 (once in six years)

Air Quality

Air pollutants associated with motor vehicle use include carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NO_x), total suspended particulates (TSP), and lead particulates. In addition, because HC and NO_x emissions are predecessors to the formation of oxidants, motor vehicles also have a significant effect on the

maximum oxidant (ozone) levels in an urban region. Monitoring results for these pollutants in the metropolitan region are presented below.

At present, the entire seven county Air Quality Control Region is classified as a nonattainment area for CO. Monitoring of St. Paul's three "hotspots" for carbon monoxide (CO) indicated that University at Snelling is the only intersection in the city which periodically exceeds the eight-hour standard. Background levels of CO were also monitored in neighborhoods within the primary study area to estimate EPA's "neighborhood scale" CO for the alternative corridors and the Short Line Road. Ultimately, these background estimates must be added directly to the CO concentrations contributed by project-generated traffic. Maximum one-hour concentrations were 5.6 ppm for Shepard Road, 5.5 ppm for Pleasant Avenue and 8.8 for the Short Line Road. Maximum eight-hour concentrations were 3.2, 3.5 and 5.3 ppm for Shepard Road, Pleasant Avenue and Short Line Road.

The Twin Cities region is currently classified as a nonattainment area for total suspended particulates (TSP). Monitoring data from St. Paul locations indicates two violations in 1978 of the annual primary standard in downtown St. Paul, and no violations in 1979. No violations of the 24-hour standard were recorded in either year.

Lead particulates were monitored by the state at four of MPCA's particulate sampling locations in 1978 and for a full year in 1979 at two locations. Violations of the calendar quarter standard of 1.5 ug/m^3 occurred at the KSTP and Tenth and Minnesota Street sites in 1978. In 1979, the KSTP site violated the standard during the winter quarter. This site was moved to Berry Street in midyear. All other locations were far below the standard in both years. In general, there was a high correlation among the sites between (annual) TSP and (quarterly high) lead levels.

Nitrogen dioxide was sampled in 1978 and 1979 at three St. Paul sites. Currently, the Twin Cities region is classified as attainment for NO_2. The data suggested that the Jackson Street site, although within the annual standard of 0.5 ppm, experiences significantly higher NO_2 levels than the other two sites. The annual means for 1979 are slightly lower than 1978 at the two downtown locations. More significant decreases (between 1978 and 1979) in the 24-hour maximums were recorded at these locations.

The ozone (O_3) monitor in the state network closest to the study area is the one situated at the MPCA Headquarters in Roseville. Sampling at this location was initiated at the beginning of 1979. The second high for that year was 0.085 ppm, exceeding the current Minnesota standard of .07 ppm, but in compliance with the recently revised national standard of 0.12 ppm. At present, the attainment status of the Twin Cities region is unclassified for O_3.

NATURAL ENVIRONMENT

Terrestrial Habitats

Because the Pleasant Avenue and Shepard Road alternate corridors pass primarily through an urban environment, vegetation along these corridors has already been disturbed to a large degree by human activities. Stands of natural woody vegetation are restricted primarily to areas along the Mississippi River where steep slopes, poor drainage and periodic flooding have limited urban development (see Figure 13). These forests are remnants of the original floodplain and bluff and cliff communities that once predominated in the Twin Cities area. Several wetlands remain along the Mississippi River in the vicinity of the I-35E bridge. These wetlands are primarily located in Crosby-Hidden Falls Regional Park and include Crosby Lake. Away from the river the vegetative habitats along the two proposed corridors are largely manmade or disturbed. They include managed grasslands along transportation rights-of-way, regenerating old fields and urban plantings. Some remnant forest areas remain along the edges of the Pleasant Avenue corridor.

Aquatic Habitats

The principal aquatic habitat associated with I-35E is the Mississippi River. It is difficult to characterize the existing habitat in the Mississippi River because of the seasonal variation and the magnitude of the river itself. The depth of the river varies considerably, from one to seven meters along the study reach. The depth varies from bank to bank, as well as from upstream to downstream. Seasonal variation in depth must also be considered with spring levels usually higher than the rest of the year.

Substrate conditions along the study reach consist primarily of compact sand and gravel with occasional rock and rubble. Finer sands and silt, and decomposing vegetation -- primarily leaf litter -- is found in the shallower areas where the water is slack.

The existing condition of the aquatic community in the Mississippi River is characteristic of a biological community typically associated with systems subject to moderate to heavy organic loading. Rough fish, which are generally more tolerant than game fish, dominate the fish community, comprising approximately 94 percent of the total fish population. Fish species which are commonly found in the Mississippi River along the study reach include carp, buffalo, redhorse, catfish, bullhead, and a variety of minnows. The macroinvertebrate communities are dominated by filter-feeding organisms which are indicative of a substantial organic particulate load. Those in backwater areas are distinctively different than the main channel with the dominant organisms being those associated with quiet water. The algal population shows a large diatom makeup. A relatively high cell density in a number of species are indicative of nutrient enrichment.

Crosby Lake which is located in Crosby-Hidden Falls Regional Park to the west of the I-35E bridge is the only other sizable aquatic resource in the project vicinity. The lake, which is approximately 40 acres, lies at River Mile 843.5 within the left bank floodplain of the Mississippi River. Aquatic vegetation is abundant and includes coontail, water lily, duckweed, pondweed, yellow water lotus and various grasses, sedges, and rushes. Fish which are common in the lake include panfish, largemouth bass, northern pike, bullheads and carp.

Wildlife*

Wildlife associated with the Pleasant Avenue corridor consist primarily of species adapted to urban and disturbed conditions. Prior construction activity generally limits wildlife potential to areas outside of the projected I-35E right-of-way. One example is the outlying Linwood Park which includes remnant hardwood forest and some fairly dense vegetative cover. The eastern cottontail and ring-necked pheasant were observed here. In addition, dead "cavity" trees in Linwood Park and in other locations are used by woodpeckers, nuthatches, and other cavity nesters such as squirrels, bats, and raccoons. They also harbor insects that are eaten by black-capped chickadees, downy and hairy woodpeckers, brown creepers, and other insectivorous birds. Use of dead trees by woodpeckers, song birds and gray squirrels is evident along the Pleasant Avenue corridor.

With regard to the Shepard Road corridor, wildlife potential is the same as in the Pleasant Avenue corridor with the primary exception of the more extensive floodplain forest associated with Crosby Farm Regional Park east of the Lexington Avenue bridge. This habitat is the most extensive contiguous area of forest in the primary impact area (see Figure 13). The shrubby edge between the floodplain forest and clearings and the Mississippi River creates an interspersion of habitat types that greatly enhances the area's wildlife value. The relatively large area of mature trees supports a number of forest-interior species not found in other parts of the primary impact area. These include the eastern wood pewee, ruby-crowned kinglet, red-eyed vireo, and pileated woodpecker. White tailed deer also use this area. Dead trees are present which harbor cavity-nesting birds and mammals.

The small Type 4 wetlands to the east of the I-35E bridge are breeding areas for waterfowl, such as mallards, and feeding areas for great blue herons. The great blue heron has been designated as a "species of special interest" in Minnesota as has the pileated woodpecker noted above.

*A detailed inventory of plants and animals likely to be found in the primary impact area is included in the special study report, "Wetlands, Fish and Wildlife" - Appendix C.

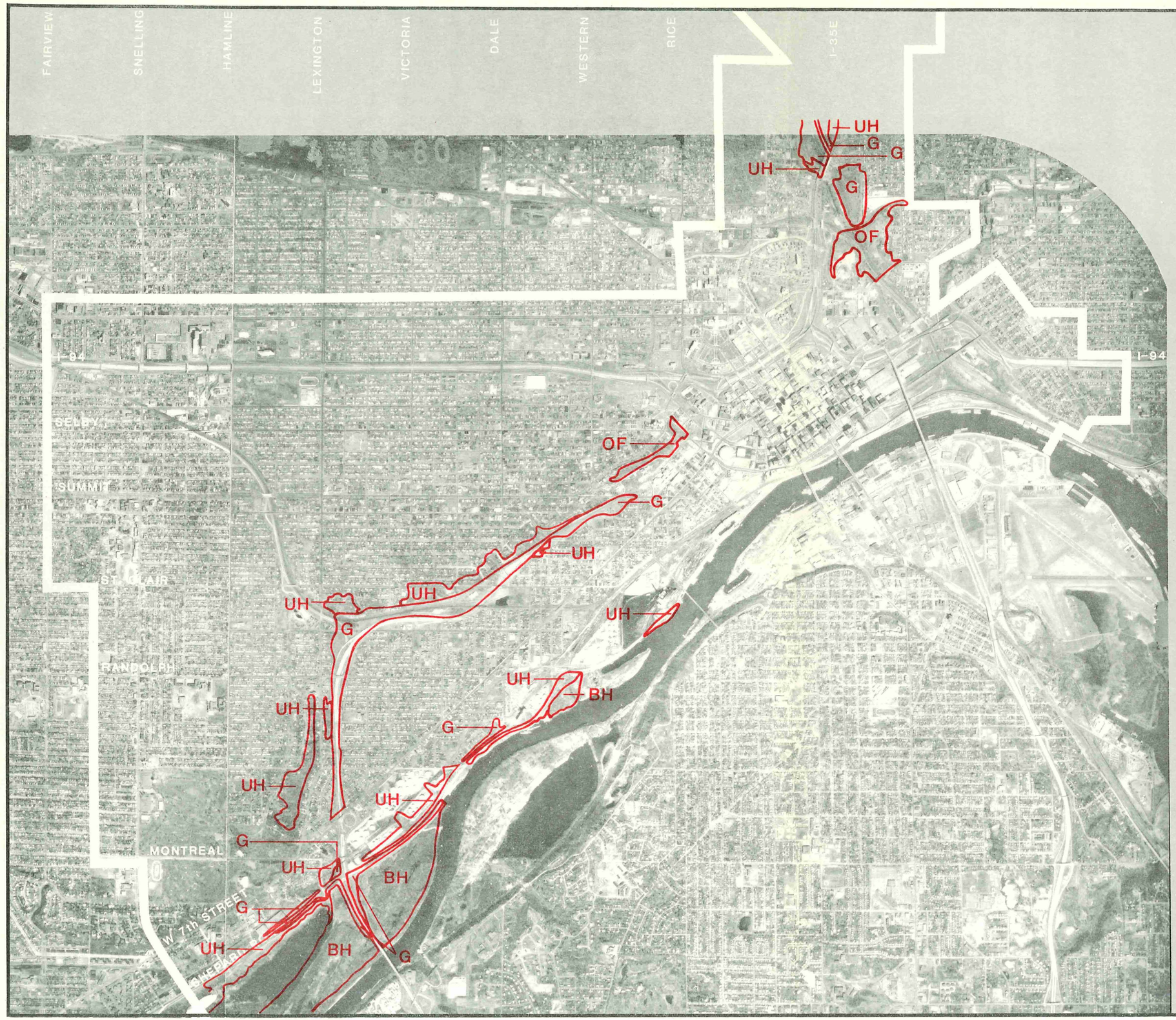


FIGURE 13

EXISTING VEGETATION

BH BOTTOMLAND HARDWOOD FOREST

UH MIXED UPLAND HARDWOOD FOREST

OF OLDFIELD

G GRASS

0 2000 4000 8000 Feet

N

I35E

SOCIAL ENVIRONMENT

Downtown St. Paul serves as the major regional focus of the proposed project and has been identified as one of two "Metropolitan Centers" in the Twin Cities area by the Metropolitan Council in recogniton of its "...regional importance for government, medical service, finance, office space, entertainment, and the arts." An estimated 64,000 jobs are located within the downtown area (including the State Capitol complex). Total office and retail space are estimated at 8,000,000 and 580,000 square feet, respectively. Surprisingly there are relatively few hotel rooms (approximately 950), and no currently open movie theaters. Generally, downtown St. Paul has evolved into a major banking and personal/professional services center with retail trade, entertainment and transient accommodations being considerably less important. However, major development plans and a construction boom are occurring in downtown St. Paul which will result in substantial increases to the existing retail space and number of hotel rooms, in addition to increases in office space, permanent residential units and parking places. This major development phase is occurring without the impetus of completed Interstate 35E.

Within the secondary impact area (SIA), the amount of residential land use is comparable for both the northern and southern suburbs with a more rapid "absorption" rate having recently occurred in the southern suburbs. The northern suburbs located within the secondary impact area include Lauderdale, Falcon Heights, Little Canada, Roseville, North St. Paul, Maplewood, Vadnais Heights and White Bear Lake. The southern suburbs include Newport, South St. Paul, West St. Paul, Lilydale, Mendota Heights, Sunfish Lake, Eagan and Inver Grove Heights. In contrast, twice as much land has been developed for commercial purposes in the northern suburbs where the commercial land absorption rate has been twice that of the southern suburbs. Industrial development in the suburban portions of the SIA has concentrated in four locations: (1) western Roseville, (2) the Mississippi River corridor south of St. Paul, (3) at the municipal boundary of Eagan and Mendota Heights in the vicinity of the proposed I-35E/I-494 interchange, and (4) the Minnesota Mining and Manufacturing administrative and research/production complex located adjacent to Interstate 94 in Maplewood. The other major industrial concentration within the SIA is located in the Midway area in St. Paul.

Primary Impact Area

The distribution of major existing land use patterns in the PIA is shown in Figure 14 and includes the following major components:

- Downtown St. Paul (including the State Capitol Complex)
- Several commercial strips radiating from downtown St. Paul
- High-density residential immediately west of downtown St. Paul

- Extensive single and two-family residential neighborhoods

- A major portion of the Mississippi River industrial and rail corridor

Market areas for the commercial strips are both local and city-wide with the exception of University Avenue, which also has a subregional market/service draw. All of these commercial streets are currently undergoing extensive rehabilitation and in one spectacular instance, market reorientation. Grand Avenue is evolving from a commercial street with a once predominantly local market orientation to a street of boutiques, art galleries, and unique professional and personal services which are attracting a rapidly expanding regional market.

The Primary Impact Area contains St. Paul's oldest and most historic residential neighborhoods, the city's most densely developed area , as well as its least and most expensive housing. Generally, the most expensive ($100,000 - $400,000) housing is located atop and near the rim of the "upper" bluff. The city's least expensive ($25,000 - $40,000) housing is located both below and atop (but back from) this bluff. Pleasant Avenue corridor is located below and parallels this major land feature from Fort Road (West Seventh Street) to downtown St. Paul.

Industrial development in the area is concentrated in the Mississippi River corridor and at the east side (i.e., Lowertown) of downtown St. Paul. Industry in the river corridor is mainly comprised of utilities, petroleum and grain storage, reflecting high capital investments and low employment. This river corridor is a major regional multi-modal transportation artery for water, rail and truck. Historic Lowertown remains a significant warehousing and wholesaling district.

Population

The population of the City of St. Paul is expected to decline from its present population of approximately 277,000 to 270,000 by 1990, and then rise to 275,000 by year 2000. The population of the primary impact area (approximately 100,000) has decreased at twice the rate of the city as a whole. By contrast, the population within the secondary impact area, with its inclusion of northern and southern suburbs, is expected to increase 36% by the year 2000. The southern suburbs alone are expected to grow 50% in this same time frame.

Employment

St. Paul's total employment base remained stable from 1970 to 1979 at approximately 185,000, and is projected to remain stable through the year 2000.

Employment in the secondary impact area is generally equally distributed between the northern and southern suburbs, with an estimated 59,200 and 59,100 employees respectively. In both cases, 1980 employment projections indicate significant increases since 1970, a 34% increase in the northern suburbs and a 53% increase in the southern suburbs. Total SIA employment is projected to increase

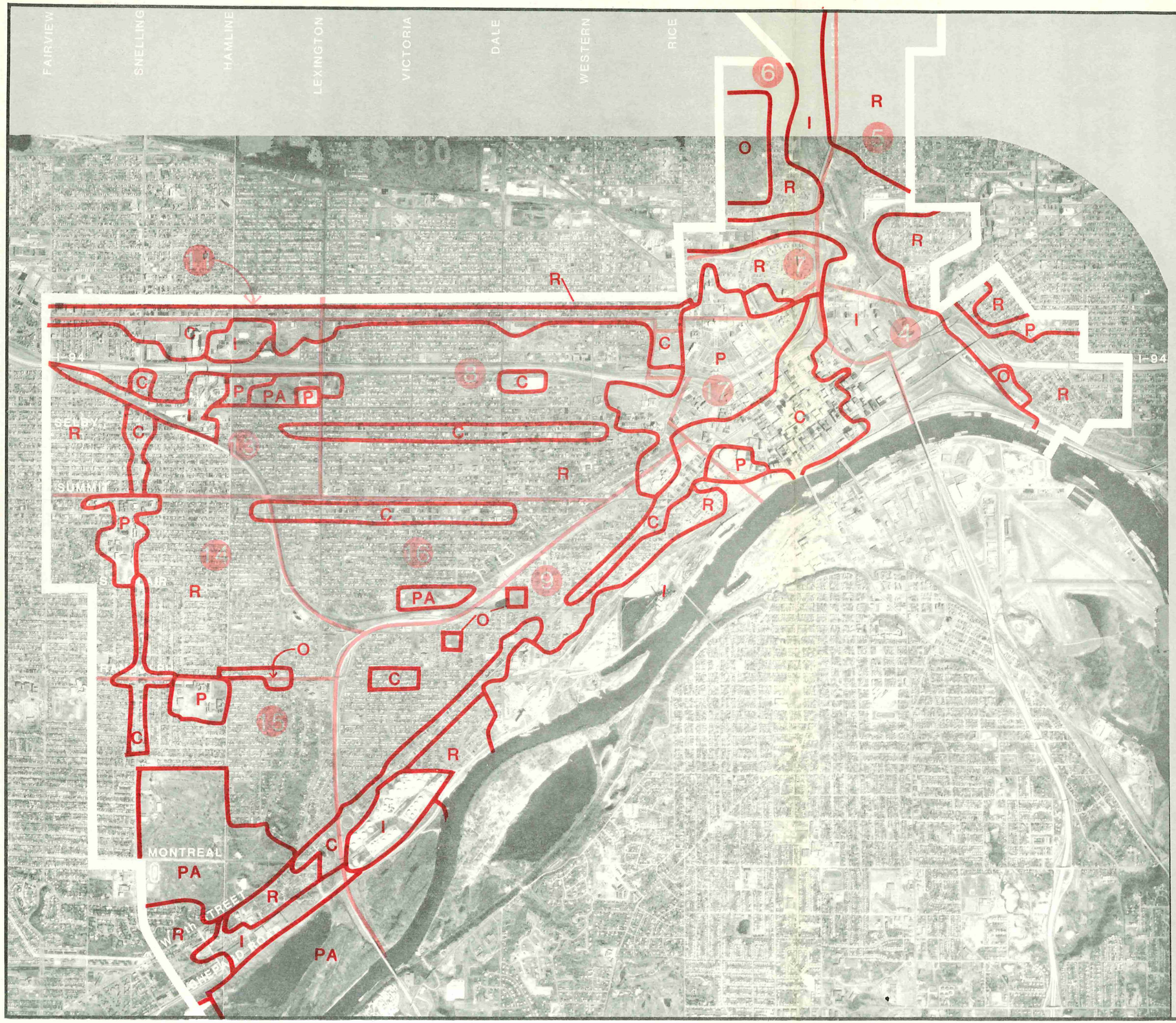


FIGURE 14

EXISTING LAND USE AND PLANNING DISTRICTS

LEGEND

R	RESIDENTIAL
I	INDUSTRIAL
C	COMMERCIAL
PA	PARK
P	PUBLIC
O	OPEN

NEIGHBORHOODS

4	DAYTON'S BLUFF
5	NORTH SIDE
6	NORTH END
7	THOMAS DALE
8	SUMMIT-UNIVERSITY
9	WEST SEVENTH
11	HAMLINE-MIDWAY
13	MERRIAM PARK
14	MACALESTER GROVELAND
15	HIGHLAND PARK
16	SUMMIT HILL
17	DOWNTOWN

0 2000 4000 8000 Feet

I35E

approximately 16% between 1980 and 2000. The greatest relative increase will occur in the southern suburbs with an anticipated 49% gain. Employment for northern suburbs will rise approximately 40%. A substantial decrease is projected for South St. Paul reflecting the continuing reduction in the meat processing industry.

Ethnic and Racial Characteristics

A very high percentage of people were native born (96.1%). The predominant ethnic groups in the city are Swedish and German (20.4% and 28.7% of foreign stock respectively).

As shown in Table 4, the St. Paul Planning Division's recent estimates of the city's nonwhite population show that it has increased dramatically and will continue to do so through the 1980s. (The non-white category used by the city includes Black, American Indian, Asians, Hispanic or Spanish-speaking persons as well as other residual groups.) The city planners feel that this increase is due primarily to a large in-migration of Hispanic people in the early 1970s. The percentage of nonwhite population should continue to rise since continued out-migration of the white population is expected.

In 1980, 63.6% of the minorities in St. Paul lived in the neighborhood districts comprising the primary impact area. This was down from approximately 75% in 1970, indicating that St. Paul's growing minority population has been moving into other areas of the city. The percentage of nonwhite residents has increased in every part of the primary impact area. The areas with the highest proportions of nonwhite residents in 1975 are in Districts 8 (57.1%) and 7 (21.5%).

Community Services

Figure 15 shows the service boundaries of police and fire protection, school attendance boundaries within the primary impact area, and medical care facilities.

In the cases of the police and fire protection service districts and school attendance boundaries, both Pleasant Avenue and Shepard Road corridors serve generally as service area boundaries. These boundaries are also reinforced by neighborhood/planning district boundaries as illustrated in Figure 14.

Major hospital facilities are clustered at the fringe of downtown St. Paul (Figure 15) except for Midway Hospital which is located in the northwest portion of the primary impact area. Access to the downtown hospitals from southwest St. Paul is presently by city streets.

The distribution of existing parks and recreation facilities and trail systems in the primary impact area is shown in Figure 16. The major park in the area is Crosby Farm Regional Park located adjacent to the Mississippi River near the I-35E bridge. This park is included in the Metropolitan Council's regional Open Space Plan and in the Urban Open Space District of the Mississippi River Critical Area. The

TABLE 4

TOTAL MINORITY POPULATION IN ST. PAUL, 1960, 1970, 1980

	1960 Census		1970 Census		1980 Census	
	Number	Percent	Number	Percent	Number	Percent
Black	8,240	76%	10,930	53%	13,305	38%
Indian	524	5%	1,906	9%	2,538[b]	7%
Hispanics or Persons of Spanish Language	1,530[a]	14%	6,512	31%	7,864[c]	22%
Other	553	5%	1,403	7%	11,161[d]	32%
Total	10,847	100%	20,751	100%	34,868	100%
Percent of City Population	3.46%	-	6.70%	-	12.9%	-

(a) Includes only the population born in Puerto Rico, of Puerto Rican parentage, and the foreign born in Mexico; probably a low estimate.

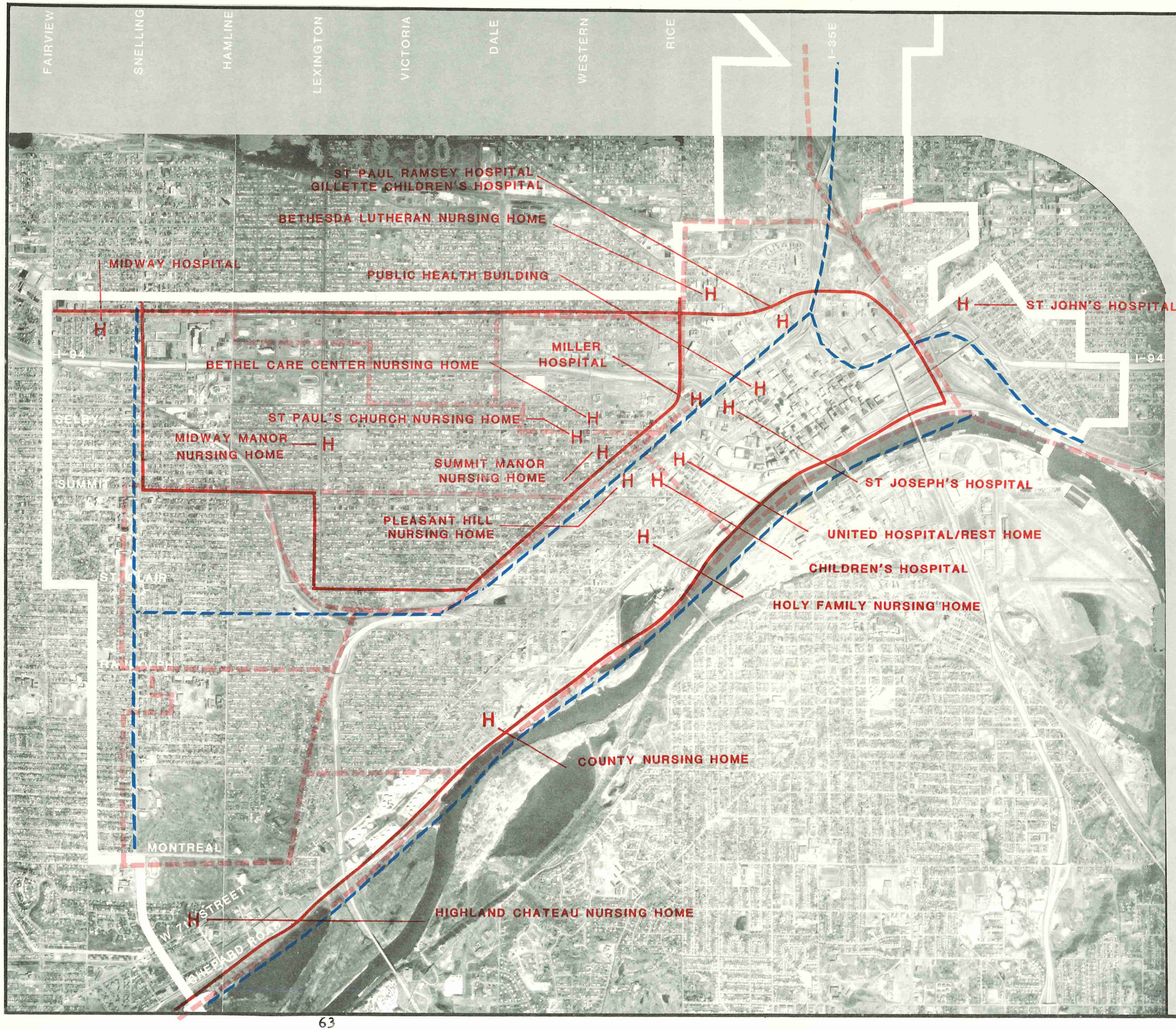
(b) American Indian, Eskimo, Aleut

(c) Spanish origin

(d) Includes Asian and Pacific Islander category and other categories in 1980 census.

FIGURE 15

PUBLIC SERVICE BOUNDARIES AND HEALTH CARE FACILITIES



H HEALTH FACILITY

POLICE PROTECTION BOUNDARY

FIRE PROTECTION BOUNDARY

SCHOOL ATTENDANCE BOUNDARIES

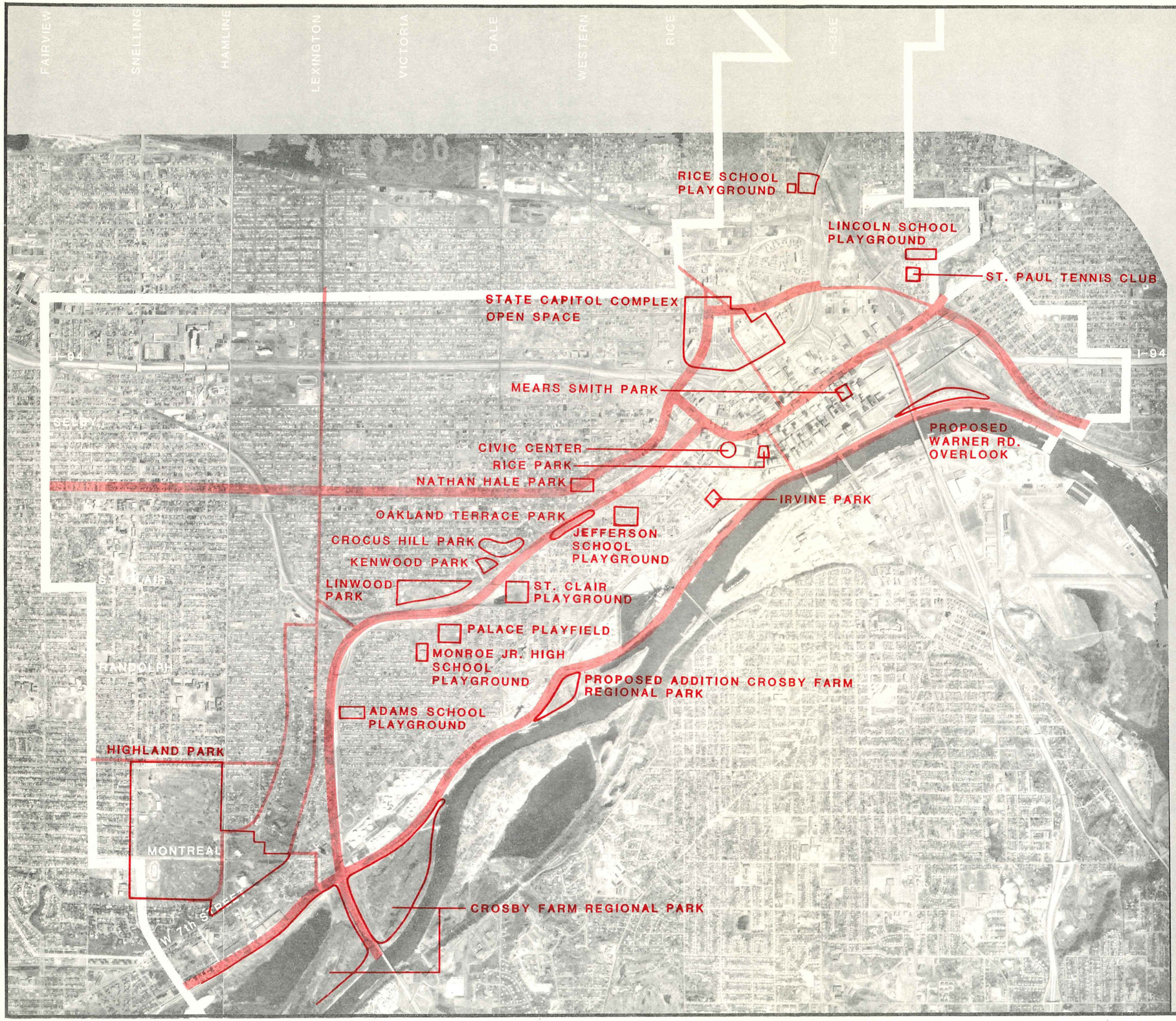
0 2000 4000 8000 Feet

N

I35E

FIGURE 16

RECREATION FACILITIES



EXISTING/PROPOSED CITYWIDE BICYCLE AND HIKING TRAIL

LINEAR PARK SYSTEM

AREA OF INTEREST

0 2000 4000 8000 Feet

N

135E

distribution of playgrounds and combination park/playgrounds follows a linear pattern paralleling both sides of the Pleasant Avenue corridor. Other recreational facilities shown in Figure 16 are athletic fields, city parks, parkways, as well as existing/proposed city-wide bicycle and hiking trails. Both the Pleasant Avenue and Shepard Road corridors are major segments in the proposed city-wide trail system. A major concern of all neighborhoods involved is the lack of open space for recreation.

Regional Land Use Plans

The entire primary and secondary impact areas are located within the "Metropolitan Urban Service Area" as defined by the Metropolitan Council. This designation allows governmental agencies to provide support for development and redevelopment.

No new regional commercial centers are planned to be located within the secondary impact area. The previously proposed site for Eagandale regional center has been abandoned. Consequently, northern Dakota County residents will have to continue to rely on the Burnsville Center and downtown St. Paul for services generally found in major diversified centers. The need for improved subregional and regional access links between northern Dakota County and downtown St. Paul has been identified in the Metropolitan Council's Transportation Policy Plan. The recent decision to abandon the Eagandale site accentuates this need since the shopping and services that would have been provided in Eagan will, in part, now be supplied in the St. Paul CBD.

St. Paul's Land Use Plan

The majority of land in St. Paul will remain in the same use with the implementation of St. Paul's plan. The following composite land use map (Figure 17) shows the major areas for change addressed in the Land Use Plan. In addition to the mixed use cluster areas, the map shows the commercial and industrial activity areas, as well as large vacant sites suitable for higher density housing. The Land Use Plan's implementation will concentrate on activities in these areas.

The remainder of the map indicates the stable residential areas of the city. These areas will continue a lower intensity mixture of commercial, institutional and recreational uses as well as the predominant underlying residential use.

Neighborhood Land Use Plans

Presented in Figure 14 are the boundaries of the St. Paul planning districts. These neighborhoods were developed by public consensus based on similar socioeconomic characteristics and natural physical boundaries. Each district is responsible for submitting an overall development plan to the city which defines its socioeconomic and physical development needs. Several of the districts have adopted policies relating to I-35E. These policies will be discussed in the Environmental Consequences section.

St. Paul Mississippi River Corridor Plan

The City of St. Paul published a Mississippi River Corridor Plan in July 1978. The goals of the plan include protecting and preserving the river corridor as an ecological, aesthetic, cultural, scientific and historic resource, while maintaining its value and utility for a variety of land uses and as an essential element in recreation, transportation, sewer and water systems. Policy objectives emphasize restriction of activities which would have negative environmental impacts, and designing existing roadways to provide a parkway character while maintaining existing traffic patterns and capacities. The plan further recommended that the continuous river open space follow the river's edge through downtown. It will connect downstream and upstream recreation areas and provide a downtown riverfront for opportunities to complement downtown activities.

Major elements to be coordinated in development and programming include:

- Lower Landing open space, to follow the river's edge from the Wabasha Street Bridge to the Robert Street Bridge. Its primary functions will be to provide for continuous pedestrian/bicycle movement, an urban open space for the proposed Lower Town residential community and a plaza and public landing.

- A setback alignment for Shepard Road between Chestnut Street and Randolph will be encouraged. Its proposed alignment would follow the C.M.St.P.&P. railroad mainline on underutilized lands. A Chestnut Street interchange would provide grade separated circulation for railroad, vehicular, and pedestrian/bicycle movement. It would be set back from the river's edge as much as possible, minimizing its impact.

- An Upper Levee Parkway from Randolph to Chestnut Street following existing Shepard Road alignment would become a river related parkway spur. It would maximize river and CBD viewing opportunities and provide access to the NSP Island Plant open space site. Movement would be at reduced speeds.

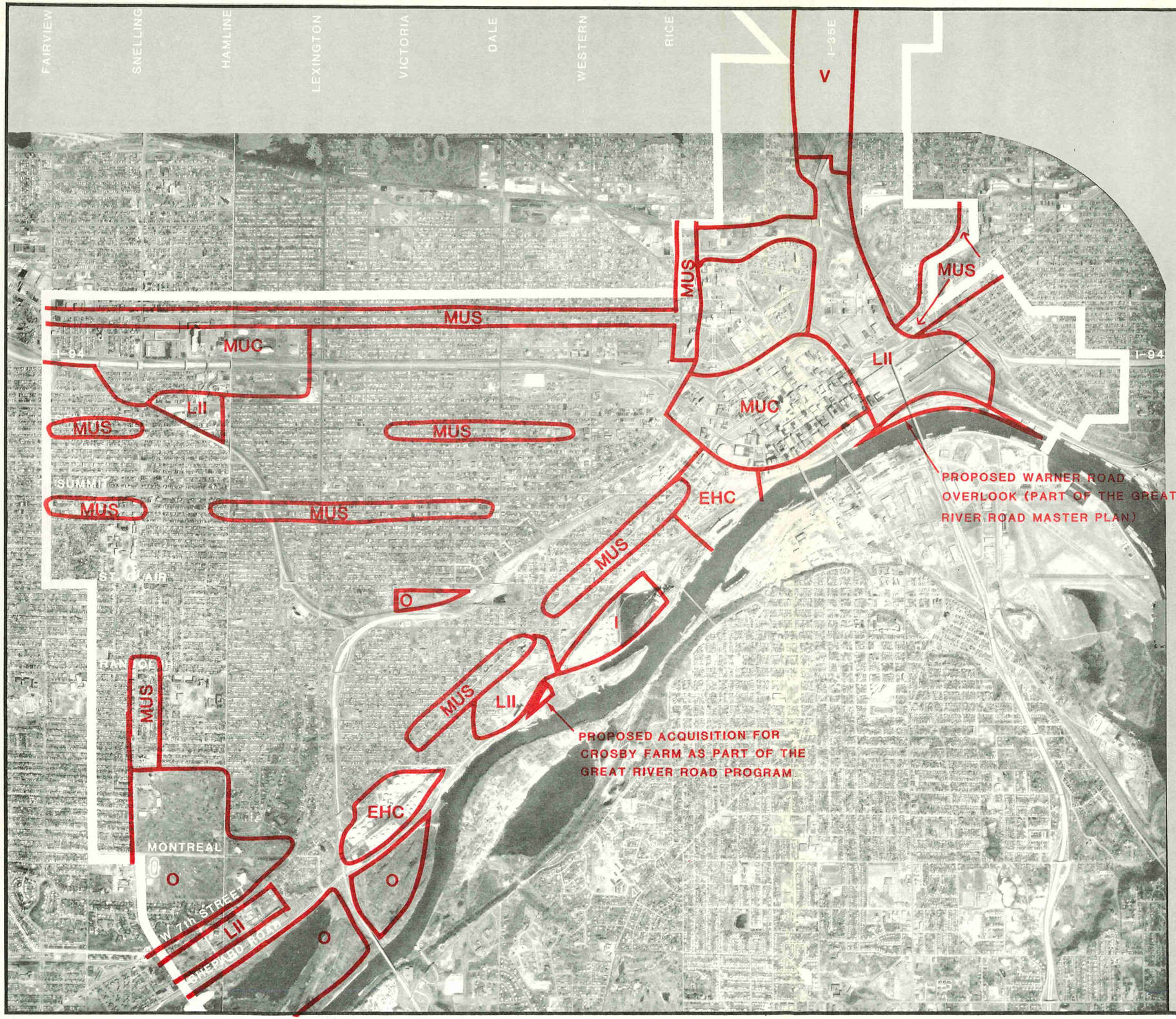
Great River Road Master Plan

As part of the Great River Road program, the I-35E bridge and Shepard Road have been designated components of the route by the Minnesota Department of Transportation. Recommendations include an attachment to the I-35E bridge to accomodate bicycle traffic. The bike trail would not follow Shepard Road because of the many physical restrictions for a bikeway.

It has been proposed to purchase property just south of the present intersection of Randolph Avenue and Shepard Road to be added to the Crosby Farm Regional Park (see Figure 17). It has also been proposed to create a long narrow open space along the left bank from Sibley Street to the Reserve Street Bridge. A roadside area would provide access to Lambert's Landing (see Figure 17). The development is tied to the reconstruction of Warner Road.

FIGURE 17

ST. PAUL LAND USE PLAN



LEGEND

LII	LABOR INTENSIVE INDUSTRIAL
I	INDUSTRIAL
MUS	MIXED USE STRIP
MUC	MIXED USE CLUSTER
O	OPEN
EHC	NEW EMPLOYMENT AND HOUSING CLUSTER
V	LARGE VACANT SITES FOR NEW HOUSING

0 2000 4000 8000 Feet

I35E

IV. ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

For the purposes of discussing environmental consequences of the proposed alternatives, this section will describe effects on an impact by impact basis. As each consequence is identified, its relevance to various alternatives will be defined. Near the beginning of each study area, a comparative matrix will summarize the discussion of impacts and all twelve alternatives. For the purposes of most physical and natural environmental impact analyses, the twelve alternatives can be addressed as four groups:

1. Pleasant Avenue (Alternatives A, A', C, D, E, F, G, and H);
2. Shepard Road (Alternative B);
3. Pleasant Avenue and Shepard Road combined (Alternatives J and K); and
4. No-Build

Where impacts are common within these groups, they will be discussed collectively. Where they become unique, in such areas as traffic impacts, they will be discussed discretely.

Following this summary matrix, a graphic portrayal of the location of site specific impacts will also be provided where appropriate to enable the reader to locate impacts at a glance. In the text will be an identification of the following where appropriate:

1. The positive and negative effects on the human environment
2. Designation as direct or indirect impact*
3. Mitigation and unavoidable adverse effects
4. The relationship between long- and short-term use of the environment with maintenance and enhancement of long-term productivity
5. Irreversible and irretrievable commitment of resources
6. Studies and methodologies used as technical input to the Draft EIS, and
7. Specific orders and laws which require special inclusion in the EIS.

Operational and construction-related impacts will be discussed on an impact by impact basis.

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* "Direct impacts" (also known as primary impacts) are the result of roadway construction, operation and maintenance. Direct impacts of transportation systems are usually most apparent adjacent or near the transportation facility. "Indirect impacts" (also known as secondary impacts) of transportation systems usually refer to the social, economic and environmental response to the transportation facility on a broader geographic basis. An example of indirect impact is development of new housing in areas now made accessible by construction of the transportation facility.

TABLE 5
GEOLOGY

ALTERNATE	I	A	A^1	C	D	E	F	G	H	B	J	K
LOCATION	NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY		FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION		DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY				W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD
Unsuitable Foundation (Low/Medium/High)	Low	Low	Low	Low	Low	Low	Low	Low	Low	High	Medium	Medium
Slope Stability (Problem Area)	None	Oakland Wall Children's Hospital Chancery	Oakland Wall Children's Hospital Chancery	Oakland Wall Children's Hospital Chancery	Oakland Wall Children's Hospital Chancery	Oakland Wall Children's Hospital Chancery	Oakland Wall Children's Hospital Chancery	Oakland Wall Children's Hospital Chancery	Oakland Wall Children's Hospital Chancery	Riverside Slopes & Deep Excavations	Oakland Wall Children's Hospital Chancery Deep Excavations in CBD Bypass	Oakland Wall Children's Hospital Chancery Deep Excavations in CBD Bypass
Erosion (Low/ Medium/High/Severe)	High	Low	Low	Low	Low	Low	Low	Low	Low	Severe	Medium	Medium

GEOLOGY IMPACTS

FIGURE 18

GEOLOGY IMPACTS

P BURIED PEAT

SC BURIED SALT AND CLAY

R BURIED ROCK SLABS

E HIGH EROSION POTENTIAL

BURIED BEDROCK VALLEY

LITTLE OR NO SUBSOIL DATA

AREA OF INTEREST

0 2000 4000 8000 Feet

I35E

FAIRVIEW
SNELLING
HAMLINE
LEXINGTON
VICTORIA
DALE
WESTERN
RICE
I-94
SELBY
SUMMIT
ST. CLAIR
RANDOLPH
MONTREAL
W 7th STREET
SHEPARD ROAD
SLOPE STABILITY STUDY AREA
C, E
P, SC, R, E
P, SC, R
SC, R
CAVES
SC, R, E
P, SC

GEOLOGY*

Unsuitable Foundations

There are three geologic elements which could cause unsuitable foundations; unconsolidated glacial soils, compressible organic soils and large boulders floating in glacial soils. As can be seen in Figure 18, there are several deep valleys cut into the bedrock which have been filled, or partially filled by soils. Also shown in Figure 18 are the areas where available data is insufficient for analysis, and an indication of the adverse geologic conditions likely to be enountered, by roadway segment.

Limited boring data for the Shepard Road corridor along the Mississippi River indicates the frequent presence of layers of organic soil, clays and silts at various depths and locations. Mitigation of these conditions, which would be most severe for the Shepard Road freeway, (Alternative B) is complicated by the high water table. Wet conditions make excavation and removal of these soils difficult to impossible. If the undesirable deposits are not removed, and a large embankment is installed, both long and short term settlement should be expected. Mitigation could be very expensive. Besides excavating and backfilling with specified fill, the areas of probable settlement can be surcharged (overloaded) with extra soil. This will accelerate consolidation. Thirty years of settlement can be accomplished in several months. When settlement is complete, the surcharge is removed and the pavement can be placed without fear of additional settlement.

The Shepard Road and the combined Pleasant Avenue/Shepard Road alternatives (B, J and K) have a similar problem complicated by a lack of soil boring data in the eastern downtown bypass area. This valley is known to contain extensive, deep peat deposits which are not evident on the surface. Should similar deposits be discovered within the corridor, the cost of construction could rise.

Swamp deposits are occasionally encountered with the Pleasant Avenue corridor, but the shallow depth to bedrock and the generally well drained nature of the soil usually allow easy removal of the problem.

A network of caves presently exist below Shepard Road, west of Drake Street (see Figure 18). The tunnels, excavated into the sandstone, were initially used for storage purposes but have long been abandoned. Ceiling movements have been monitored at points within the caves in

* This section is based on "Soil Properties" - Appendix O. Impacts described in this report are based upon a study of soil borings, general geologic soils maps, logs of wells and other information currently available from public documents.

the past. In 1966, a portion of the caves collapsed, requiring the construction of a massive retaining wall within the caves and a large section had to be backfilled. Collapse of the tunnel appeared to be due, in part, to the gradual loss of strength of the tunnel ceilings and walls. Further study of these indicates that if they are backfilled prior to construction of the Shepard Road freeway, settlement can be reduced to an acceptable level.

Slope Failure

Several areas of potential slope failure are located on the Pleasant Avenue corridor. They are located near the old Children's Hospital, the St. Paul Archidiocese Chancery and the Oakland Wall (see Figure 18). These buildings are situated on top of weathered Decorah Shale, which is a clay-like substance. Excavation at the base of the hill for roadway grading could cause slope failure.

To address this possibility, a geotechnical consulting firm was retained by MnDOT to determine the stability of the slopes and structures. Their report and another report by others made many specific recommendations for construction at the base of the slope. They concluded that the 1970 freeway design could be constructed safely, provided special construction and monitoring techniques were employed. New alignments, associated with the newer alternatives, are different in this area and have not been analyzed for stability. Generally, they are farther away from the toe of the slope, so they should present less of a problem than the six lane freeway considered in the report. However, since it is a problem area, it should be futher analyzed prior to any construction.

If a Shepard Road freeway (Alternative B) is to be constructed, slope stability will become a concern along the entire alignment. If the roadway is expanded to the river side of the existing roadway, stabilization of the slopes would be difficult. River currents, groundwater seepage, alluvial foundations and the weight of new soil all contribute to the difficulty of construction. Because the construction would be in or adjacent to the river, failure of massive amounts of earth would severely affect the river water quality.

Because of the high water table, slope stability in areas of moderate to deep cuts could also be a problem for the Shepard Road freeway and east CBD bypass. In Alternatives J and K, where Shepard Road itself would not be improved, these stability impacts would occur only around the east side where the new bypass would be constructed.

Failure of the slope, due to attack by the Mississippi River currents, can be mitigated by special construction including armoring the toe and base of the slope with scour resistant materials such as rip rapping, pavement, gabions, concrete mattresses, vegetation and bulkheads. Adequate subsoil drainage would help prevent failure due to excessive seepage. Surface runoff over the slope should also be minimized. River currents can also be reduced by placing transverse obstacles into the river. However, this last solution could cause undesirable navigational hazard. Most of these solutions are expensive and would contribute substantial cost.

Erosion During Construction

Erosion can create driving safety obstacles, clog sewers, inhibit vegetation and pollute streams. Erosion occurs everywhere as part of the normal earth processes. It becomes a problem when it is accelerated, moving soil particles faster than natural systems (such as vegetation and streams) and manmade systems (such as sewers) can acommodate. Adverse impacts from erosion are mostly confined to the construction phase except for Alternative B which would be constantly subject to the scour forces of the Mississippi River.

Construction increases erosion by exposing highly erodable materials, removing vegetation and creating new slopes and landforms which cannot tolerate storm runoff without damage. Most of the grading and revegetion has been completed in the Pleasant Avenue corridor. Erosion potential of the soils in the completed portion of the corridor is not considered severe (see Figure 18). The slopes are presently covered with vegetation and have been graded to prevent rapid runoff. If the existing cover is removed, erosion controls should be implemented.

Areas of major cuts and fills in the remainder of the corridor have not yet been identified. These areas are the most likely to create erosion. Prior to setting final grades, more soils data should be collected to identify horizons of excessively erodible soils. Where encountered, exposure of these horizons to rain and snow should be avoided by leaving them undisturbed and covered, or by removing and burying them below more resistant soils.

The Shepard Road freeway (Alternative B) produces severe erosion hazards for many reasons. River current will attack the new fill required over most of the segment. Delivery of eroded sediment to the river approaches 100% thus having a greater impact potential on water quality, possibly degrading river quality conditions to the point of adversely affecting the aquatic community. Also, the limited data available for soils in this area indicates that the soils are moderately to severely erodible if exposed.

Alternatives J and K would cause the next greatest impact because of their greater area of disturbance. Alternative I would cause the next greatest damage due to the earthwork necessary to convert the right-of-way to other urban uses. All Pleasant Avenue corridors would have the least erosional impact. Erosion during construction in these corridors can be reduced by: minimizing grading, active construction areas, and the slopes created; limiting construction in critical areas to the dry times of the year; diverting runoff water away from the construction area; constructing sediment traps and detention basins within the construction area; and replanting as soon as possible after final grading.

Erosion control, during construction within the river channel itself (Alternative B) is much more difficult. Construction during low flow would help, as well as minimizing current velocities near the toe of the fill areas. Permanent erosion control is essential and should

include armoring waterside slopes against erosion with rocks (riprapping), pavement or other materials.

In all matters of erosion control, whether temporary or permanent, the contractor's work will be governed by Minnesota Division of Highways "Standard Specifications for Highway Construction." Any additional specifications determined during the design study for the proposed action should be included in the construction contract.

The St. Peter Sandstone, which outcrops frequently along the Shepard Road corridor, is easily eroded by moving water. Present efforts, by the City of St. Paul, to reduce this erosion by applying a cementing agent have reduced the necessity for erosional maintenance. Should these or other outcrops be disturbed by excavation, they will again be susceptible to erosion unless they are sealed.

Unavoidable Adverse Impacts

All of the above-mentioned impacts would be classified as direct impacts. Sloughing and erosion during construction of Alternative B cannot be entirely mitigated. It is most likely that the Mississippi River would receive abnormally high concentrations of suspended solids as a result of I-35E construction under this alternative.

Irreversible Commitment of Resources

Contour grading of the roadway will irreversibly commit the manpower and materials used in this grading.

TABLE 6
HYDROLOGY

ALTERNATE	I	A	A[1]	C	D	E	F	G	H	B	J	K
LOCATION	NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY		FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION		DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY				W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD
Increased Impervious Surface	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant
Storm Sewer Adequacy	Adequate	Adequate	Adequate	Adequate	Adequate	Adequate	Adequate	Adequate	Adequate	New sewer required for east side bypass. Could relieve existing problem. Pumped outlet required on floodplain.	New sewer required for east side bypass. Could relieve existing problem.	New sewer required for east side bypass. Could relieve existing problem.
Aquifer System Impact	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant

HYDROLOGY IMPACTS

HYDROLOGY*

Increased Impervious Surface

Estimates have been made of the decreased amount of groundwater infiltration for those portions of both corridors which are not paved under existing conditions. Although the Shepard Road corridor is longer than the Pleasant Avenue corridor, the former overlies several stretches of existing roadway, making the presently unpaved portion shorter. The estimated decrease in annual infiltration due to the highway pavement is 3.0 inches for the Pleasant Avenue corridor and 4.8 inches for the Shepard Road corridor. Taken over the respective unpaved lengths of each corridor, this amounts to 11.7 and 14.7 acre-feet per year, respectively. Infiltration will be greater for a parkway in the Pleasant Avenue corridor. Runoff volume from the Pleasant Avenue area, should it be developed for nontransportation urban uses, (such as in the no-build alternative) would be approximately the same as roadway development. The change in runoff is insignificant for all alternatives. Both surface and groundwater runoff from either corridor eventually flows to the Mississippi River.

Storm Sewer Adequacy

To determine the effect of increased or decreased runoff on existing storm and combined sewers, plans were obtained from the City of St. Paul and MnDOT which showed existing storm sewers, combined sewers (storm and sanitary), and relief or overflow sewers in the vicinity of the corridors (see Figure 12). Three major stormwater outlets to the Mississippi River were identified and reviewed in relation to proposed highway construction. These were the Kittsondale Tunnel, the St. Peter Tunnel, and the Trout Brook Tunnel.

Development of the Pleasant Avenue corridor under all alternatives will result in increased peak discharges to the storm sewers. Since these storm sewers were designed and constructed primarily for drainage of the freeway, roadway construction would not be expected to impact adjacent storm sewers beyond acceptable standards. Nor will they cause backwater in adjacent systems due to corridor development. Where adjacent systems and the Pleasant Avenue corridor share the same outlet (i.e., the St. Peter and Kittsondale Tunnels) analysis showed that no increase in frequency of local flooding is anticipated as a result of corridor development.

Development of the Shepard Road corridor by itself or in combination with Pleasant Avenue parkways should not result in any significant sewer capacity consequences. No significant impacts are anticipated because the corridor is adjacent to the Mississippi River between the

* Impacts in this section are derived from "Hydrology/Hydraulics" - Appendix K, and "Hydrogeology" - Appendix H.

Lexington Avenue and Lafayette bridges, and storm drainage can be accomplished for the corridor without affecting any adjacent systems. Between the Lafayette Bridge and the junction of the downtown bypass with existing I-35E north of downtown the Shepard Road corridor parallels the Trout Brook trunk system of the City of St. Paul. The Trout Brook line has combined storm and sanitary sewer functions. Capacity problems exist within the Trout Brook system during storm events. Freeway development in this portion of the corridor would require the construction of a new storm sewer designed to drain the corridor without adversely affecting adjacent systems. Where feasible, it is possible that a positive impact could be realized by utilizing the freeway storm sewer to augment the capacity of the Trout Brook system and provide relief for tributary storm sewer systems. (See Figure 19 for location.)

From approximately the High Bridge Power Plant to the Lafayette Bridge, development of the Shepard Road freeway (Alternative B) could result in some diking of lands north and west of the freeway corridor (see Figure 19). These lands, which presently lie within the floodplain of the Mississippi River, could be flood-proofed by installing pumped outlets behind the freeway fill. In any event, freeway construction should not cause an increase in local flooding beyond the risk that presently exists. This may require installation of some additional storm drainage capacity to adequately drain areas affected by freeway encroachment.

Neither corridor should adversely affect the operation of the combined sewers in areas adjacent to the corridors. Nor will either corridor result in any significant change in drainage patterns. Some beneficial impact might be anticipated in both corridors as additional storm sewers were constructed to service the freeway and provide relief for local systems.

Aquifer System Impact

There are four water-bearing formations (aquifers) which interact with the Mississippi River. They are:

1. The surficial aquifer, (This includes all groundwater stored in soil);
2. The Platteville aquifer;
3. The St. Peter aquifer; and
4. The Prairie du Chien-Jordan aquifer.

Their order is presented in the cross sections in Figure 10. The groundwater acts as four distinct units, each under a different pressure. Water pressure levels are also portrayed in Figure 10.

The surficial aquifer receives its water supply directly from the surface. Where the Platteville and St. Peter are overlain only by sandy soils, they too can receive direct "recharge." Otherwise recharge occurs many miles away, where the bedrocks reach or are near the surface.

Because surface runoff will increse by 3.0 to 4.8 inches per year, groundwater recharge is expected to be reduced by a like amount. Reducing annual infiltration by this amount would not result in a measurable depression in any water table. As can be seen in Figures 10 and 12, groundwater in the area flows to the Mississippi River. Thus, regardless of whether water runs off the surface or via groundwater, it eventually reaches the Mississippi.

As shown in Figure 12, Crosby and Pickerel lakes do not receive groundwater from the corridor areas. Consequently, there will be no adverse groundwater impacts on these resources. Because the day-to-day operation of the highway would have no measurable impact on the water table, there will be no lasting groundwater-related hydrologic impacts on the lowlands.

The closest municipalities using groundwater for water supply are Shoreview, Inver Grove Heights, and Richfield. These wells are sufficiently distant from either corridor to prevent any adverse groundwater impact to municipal water supplies.

The water pressure level in the St. Peter (the aquifer nearest the surface with wells in the vicinity of the corridors) is 13 to 75 feet above the pressure level of the Prairie du Chien-Jordan. It is an indication of the isolation of these two aquifers. This pressure level would have to drop drastically before hydraulically affecting the Prairie du Chien-Jordan. The water pressure surface of the St. Peter is from 30 to more than 40 feet below the top of the St. Peter for the Pleasant Avenue corridor and approximatley 45 to 50 feet below the St. Peter top for the Shepard Road corridor. Consequently, construction will not intersect St. Peter groundwater. No withdrawal of St. Peter groundwater will be required during construction. If the St. Peter groundwater is not disturbed, then none of the bedrock aquifers will be hydraulically affected by construction or operation of either corridor.

Construction Impacts

Difficulties with construction dewatering were discussed previously, in part, in the geologic section on slope failure. Although areas of excavation have not been delineated for the Shepard Road freeway (Alternative B) or east side CBD bypass (Alternatives J and K), deep excavation almost anywhere along these alignments will be difficult because of the high water table. Pumping, probably at a high rate, may be necessary for short periods of time. If soil sloughs off the slopes of the excavation (a good possibility in the alluvial soils of the river valley) a settling basin may be required to clarify water prior to discharge to the river.

All of the above-mentioned impacts would be classified as direct impacts. All of these minor impacts can be mitigated, or can actually improve the present situation.

TABLE 7
MISSISSIPPI RIVER FLOODPLAIN IMPACTS

ALTERNATE	I	A	A[1]	C	D	E	F	G	H	B	J	K
LOCATION	NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY		FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION		DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY				W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD
Floodplain Impacts	None	None	None	None	None	None	None	None	None	Significant	Negligible	Negligible
Floodplain Encroachment										370 acres	10 acres	10 acres
River Channel Encroachment										2.5 acres	None	None
Impacts at Normal Elevation										Negligible	Negligible	Negligible
Flood Impacts River Miles Affected										5.6	None	None
Increase in Floodplain Area										Negligible	None	None
Increase in Flood Damage										Yes	None	None
New Structures Flooded										None	None	None
Isolation of Floodplain Areas										Yes	No	No
Maximum River Velocity Increase										1 ft/sec	0.3 ft/sec	0.3 ft/sec
Increased Scour										- Robert St. Bridge - Sewer Crossing - Watermain Crossing	No Adverse Impacts	No Adverse Impacts
Other Impacts										- Docking Facilities - Lambert's Landing - Relocate Main Channel	None	None
Induced Floodplain Development										No	No	No
Degradation of Natural Floodplain Values										Aquatic Environment Terrestrial Vegetation & Wildlife Parkland Aesthetics	No	No

MISSISSIPPI RIVER FLOODPLAIN IMPACTS

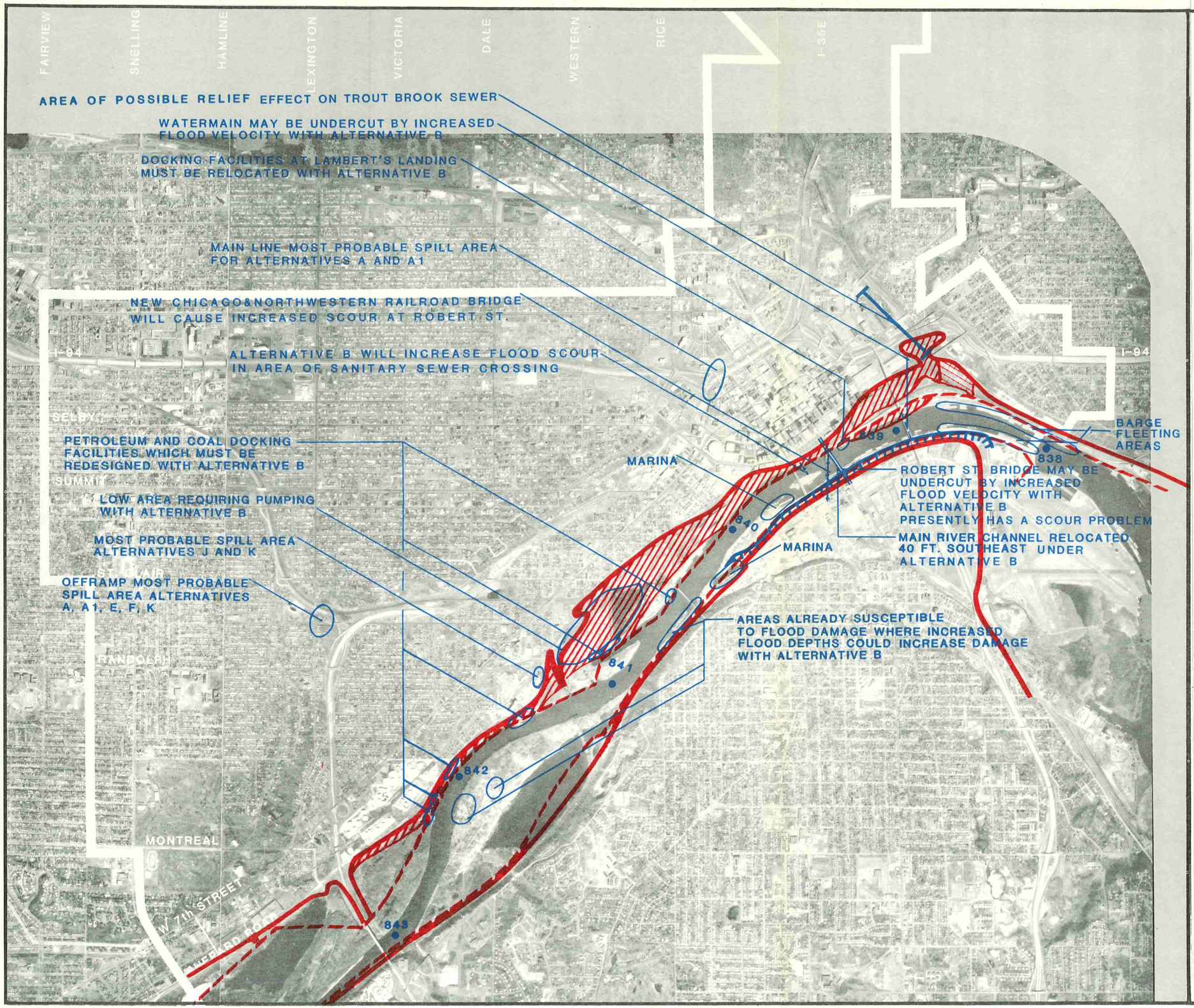


FIGURE 19

FLOODPLAIN & WATER RELATED IMPACTS

- RIVER MILE
- ST. PAUL FLOOD CONTROL PROJECT
- REGULATORY FLOODWAY
- 100 YR. FLOODPLAIN LIMITS
- ENCROACHMENT DUE TO ALTERNATIVE B
- ENCROACHMENT DUE TO ALTERNATIVES J&K

0 2000 4000 8000 Feet

I35E

MISSISSIPPI RIVER FLOODPLAIN IMPACTS*

As required by Executive Order 11988, this section will assess the flood hazards and evaluate risks of Alternatives B, J and K, since these three encroach upon the Mississippi floodplain. Remaining alternates (A, A', C, D, E, F, G, H and I) do not encroach on any floodplains. For the purposes of this section, floodplain means those surface areas which would become wet as the result of Mississippi River runoff after a storm of 1% probability (likely to occur once every 100 years).

Floodplain Description

The Mississippi River enters the study area as a 400-foot wide stream meandering within a half-mile wide, flat floodplain. (See Figure 19). This floodplain was originally cut by Glacial River Warren, the southwest outlet for Glacial Lake Agassiz. The poorly drained valley is now filled with alluvium and is the site of numerous floodplain lakes, swamps and wetlands. Near downtown St. Paul, the river valley narrows to approximately 500 feet before rounding the bend and expanding to a width of a mile and a half.

River Use

The Mississippi River is the major waterway of the Upper Midwest. Various uses of this river include navigation; industrial, and municipal water supply; recreation; and dilution/assimilation for wastewater effluent as well as point and nonpoint source pollution. The many locations of river use are indicated on Figure 19. Municipal water intakes are located upstream, beyond the I-35E impact areas. In 1976, about 400 ft^3/sec. of wastewater effluent was discharged just below the primary impact area from the Metropolitan Waste Water Treatment Facility. This amounts to 18 percent of a 7-day, 10-year low flow at this point in the river, and 4 percent of average river discharge.

Floodplain Hazard Evaluation

The portion of the Mississippi River within Pool No. 2 was chosen for study in this section because effects of the Interstate 35E Shepard Road corridor are not likely to be noticeable upstream or downstream of the pool. Pool No. 2 extends from Lock and Dam No. 1 at river mile 847.7 to Lock and Dam No. 2 at river mile 815.2 on the Mississippi River. The 100-year discharge (160,000 CFS) was used in this study to define probable impacts on flooding events and related scour and deposition patterns.

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* Information on floodplain impacts is derived from "River Morphology and Flood Hazard" - Appendix I.

The Shepard Road freeway (Alternative B) would longitudinally encroach on effective flow areas of the 100 year floodplain from the I-35E bridge at river mile 843.2 to just east of the Lafayette Bridge at river mile 838.5, encroaching directly on the river channel near river mile 841.0 (see Figure 19). Railroad tracks, which must be relocated to accommodate the Shepard Road corridor, would encroach on the normal pool river channel between river mile 838.5 and 840.0. Approximately 370 acres of floodplain would be encroached by the corridor. Approximately 2.5 acres of channel would be removed from the river by the relocated railroad tracks. Encroachment on the regulatory floodway would occur near river miles 842, 841 and between 838.5 and 840, amounting to less than 5 acres. During the 100-year flood, a 500-foot stretch of the Shepard Road freeway east of the Lafayette Bridge would be under water. All displaced railroad tracks would be built above the 100-year floodplain.

Modifications to Shepard Road for Alternatives J and K would follow the existing route until the bypass east of the Lafayette Bridge. The bypass would encroach on effective flow areas of the floodplain from river mile 838.4 to river mile 838.9. Approximately 10 acres of floodplain would be encroached by the corridor. While portions of the existing Shepard Road would flood during a 100 year event, the new facilities would not. This is because the bypass is elevated to pass over Shepard Road in the floodplain area.

Impacts at Normal Pool Elevation

At normal pool, average Mississippi velocities are likely to be changed by less than 0.1 feet per second, and elevations to be changed by less than 0.05 feet due to encroachments caused by Alternative B. At "ordinary highwater" elevation (17,500 CFS) average velocities will change by approximately 0.1 ft/sec., and water surface elevations by less than 0.1 feet. The velocities and water surface elevation changes caused by the worst case (Alternative B) will not significantly affect ordinary sediment movements or channel operation at normal river flows. Impacts from Alternatives J and K would also be insignificant since their encroachment is much smaller.

Impacts and Mitigation Due to Increased Flood Elevations

Alternatives J and K will not cause a measurable rise in flood elevations. The 100-year flood elevations for the Mississippi River are increased by up to 0.1 foot due to the Alternative B longitudinal encroachments. This surcharge may be observed from the encroached area (river mile 838.5) through river mile 844.1 on the Mississippi River.

When the Shepard Road freeway is added to the total flood fringe development plan adopted by the City of St. Paul, the total maximum flood height increase would amount to 0.6 feet. By comparison, Minnesota DNR's floodplain regulations permit floodplain and floodway encroachments which cause increases in flood depth of up to 0.5 feet. Greater stage increases are permitted only if it can be shown that these increases do not materially affect flood damage potential.

Because the river banks in the reach are quite steep, the small increase in water surface elevation caused by the I-35E freeway would not affect the other boundaries of the 100-year floodplain significantly. Flood damage from the freeway on the south overbank between river miles 838.2 and 840.2 would not be likely to increase because structures in this reach are protected by the U.S. Army Corps of Engineers' St. Paul Flood Control Project (see Figure 19). However, raising the height of the flood barrier 0.1 feet may be desirable to maintain existing freeboard. Upstream of the St. Paul flood control project, water surface elevations in the south overbank between river miles 841.0 and 842.6, where a number of structures exist, would be increased by a small amount. This increase in elevation, however, is not likely to flood any new structures but may increase damages at existing structures within the floodplain (see Figure 19). Available data on these structures is insufficient to quantify flood damage in this portion of the river.

Damage along the north overbank is likely to be reduced below existing levels by the diking effect of the freeway itself. It would be possible for river water to enter the area behind the freeway during the actual flood event via culverts and freeway underpasses unless provisions are made to prevent this backflow. Interior drainage facilities (pumps) would also be necessary for any unfilled floodplain areas which are inside the freeway or railroad embankment to provide drainage when the river is at flood stage. (See Figure 19 for location.)

The changes in flood elevation from floodplain encroachment which would be necessary for the Shepard Road freeway option probably would result in a small increase in flood damages in certain areas. The magnitude of these increases cannot be determined with available data. Thus if this alternate is selected, the City of St. Paul must revise their flood fringe development plan to preclude sufficient development elsewhere to limit the cumulative flood rise to 0.5 feet or less.

All alternatives will have no measurable effects on the Minnesota River. No increase in flood damage is expected with Alternatives J and K. The remaining alternatives being considered in this report (Alternates A, A', C, D, E, F, G, H and I) cause no encroachment.

Impacts and Mitigation Due to Increased Flood Velocities

The velocity distribution in a river cross-section can be altered substantially by encroachments. This distribution is important because it relates directly to scour (the process of river bed erosion which can undermine bridge and other structural footings). The proposed Shepard Road freeway encroachments reduce the cross-sectional area of the floodplain between river miles 838.5 and 840.0, resulting in increases of average velocities during 100-year floods of up to 1.0 foot per second. The enroachment would increase average velocities on the north side of Navy Island (river mile 839.5) by approximatley 1 foot per second and on the south side by approximately .2 feet per second. It would increase average velocities beneath the Robert Street Bridge by 0.7 feet per second. Presently, during a 100-year discharge, river velocities range as high as 11.3 feet per second under the Robert

Street Bridge, and 10 feet per second north of Navy Island, to as slow as 5 feet per second south of Navy Island.

Because the construction of the Shepard Road freeway would change river velocities and water surface elevations, deeper scour depths were predicted for 100-year events after the freeway's construction. The reconstruction of the Chicago and Northwestern railroad bridge (necessary for Alternative B) would cross an existing scour hole in the river bed which is approximately 25 feet deeper than the average channel bottom and would involve replacement of the shear fences and lift section of the existing railroad bridge. (See Figure 19). Since the shear fences of the Robert Street bridge were undermined during the 1965 flood event, it is probable the the scour hole beneath the main span could be enlarged enough to undermine the foundations of bridge piers.

Possible mitigating measures include using appropriately-sized riprap to protect the bottom of the river. Preliminary analysis indicates that this would require approximately 3,000 cubic yards of riprap costing nearly $90,000. Consideration should be given to riprap near all piers of the bridge.

An alternative mitigation involves replacing the entire railroad bridge approximately 330 feet upstream. This option would involve either a swing span or a lift section to accommodate marine traffic. While this alternative may involve 20 to 25 feet of pier scour and extra costs, it avoids potential enlargement of the already serious scour near the Robert Street Bridge.

A sanitary sewer siphon crosses the river at river mile 839.4 from Navy Island and a water main crosses at river mile 838.9 (See Figure 19). Erosion of bed material during 1965 and 1969 has already caused voids beneath both the siphon and the watermain. The erosion would be likely to increase slightly at the watermain at mile 838.9 and severely at the siphon at mile 839.4 if Alternative B is implemented. The Navy Island sewer siphon is currently being replaced. The replacement is located near the same location, but at a substantially lower elevation, where scour damage is much less likely.

The encroachment necessary for modifications to Shepard Road for Alternatives J and K increase average velocities by 0.1 foot per second at river mile 838.4 and 0.3 foot per second downstream of the Lafayette Bridge approximately at river mile 838.6. No adverse impacts are anticipated from these slight velocity increases.

Effect on Natural and Beneficial Floodplain Values

As discussed in other sections of this EIS, the Shepard Road freeway will adversely affect:

1. The aquatic environment in this reach of the river due to increased erosion, especially during construction.

2. Lowland vegetation and wildlife by removal of bottomland hardwoods and increased deer kill.

3. Parkland, open space and outdoor recreation in the Crosby Farm Park and its proposed expansion area.

4. The aesthetics of the natural river valley by scenic intrusion.

Items 2 and 3 above cannot be mitigated because they are a direct result of the conversion from existing uses to a transportation facility. The facility cannot be realigned to reduce these impacts. Special erosion control and aesthetic mitigation practices discussed in the geologic and aesthetic impact sections can be employed to minimize, but not eliminate these impacts. Even with mitigations, a significant impact will remain.

The longitudinal encroachment of the Alternative B Shepard Road Freeway would remove about 200 acre-feet of storage from the 100-year floodplain of the Mississippi River between river mile 838.5 and 840.0. This represents about five percent of the channel storage in this portion of the river. Although large volumes of storage may have the effect of attenuating peak flood discharges, an analysis of the effect of storage during the flood of 1965 indicates that peak discharges are reduced by less than 0.1 percent because of storage. Therefore, loss of a small portion of channel storage due to freeway encroachments would not cause significant increase in peak discharge.

In that Alternatives J and K would not significantly change the existing Shepard Road, except at the East CBD Bypass (in the area of existing railroad yards), it is not expected to adversely affect natural and beneficial values of the floodplain.

Other River Impacts

Construction of the Shepard Road freeway would necessitate the redesign of petroleum product docking facilities at river miles 840.8, 841.6, 842.2, 842.3, and 842.5. It would also necessitate redesign of grain handling dock facilities at river mile 841.7 and a modification of coal docking and spreading facilities at the High Bridge Power Plant at river mile 840.5.

Unloading facilities at the tank farms is flexible because the petroleum is moved through a pipeline. A booster pump and additional flexible pipeline can serve temporarily during construction, or the new facilities could be built prior to dislocating the old facility. Mechanical transfer facilities such as those at the coal and grain docks are less flexible and may require staged construction for continuous operation.

Reconstruction of railroad lines adjacent to the freeway could cause the irretrievable loss of Lambert's Landing at river mile 839.0 which now consists of a mooring and a breach in the flood control wall. There is no parking or assembly area. It presently creates a safety hazard for existing Shepard Road traffic. Passengers and materials now handled at this dock could be handled at other docks adjacent to the St. Paul central business district. Under Alternatives J and K, Lambert's Landing will be expanded into a river park and a road rest

area at the interchange between Shepard Road, Warner Road and the east CBD bypass.

Disruption of the docking and fleeting facilities can best be mitigated by sequencing the construction in the area so as to leave at least partial docking or fleeting capacity at all times.

Construction impacts can also be reduced by timing critical construction to occur during the least busy barge seasons.

Shear fences relocated, for Alternative B, to protect the piers of the reconstructed portions of the Chicago and Northwestern Railroad Bridge (discussed earlier) would effectively move the main river channel and boat traffic 40 feet southeast beneath the Robert Street Bridge.

Maritime river traffic ceases at river elevations greater than 700.0 feet mean sea level near the St. Paul central business district, due to reduced bridge openings. River traffic movement would not be affected noticeably by the increases in velocity or stage caused by Interstate 35E.

Freeway construction would not be likely to affect flow significantly in the open channel above river mile 843.5.

Construction of Alternative B, J, or K is not likely to induce adjacent floodplain development because the area is fully developed within the confines of the flood fringe.

Determination of Significant Encroachment

As required in the Federal Aid Highway Program Manual, Alternatives B, J and K were assessed to determine if their encroachments would be considered "significant" under the definition presented in paragraph 4.q of F.H.P.M. 6-7-3-2. The three criteria include:

1. Interruption potential for essential emergency or evacuation routes

2. Cause of a significant risk

3. Cause of significant adverse impact on natural and beneficial floodplain values.

As discussed in the social impacts section, the Shepard Road freeway (Alternate B) does not function as well as the other alternatives for emergency vehicle service to area hospitals. However, it could provide limited utility, and would serve the Ramsey County Jail. The Shepard Road freeway alternative is not an integral component of any existing evacuation route. But since it would be a major, high volume route serving the central business district, it may be desirable for evacuation plans in the future. Since 500 feet of this freeway would be flooded during a 100-year flood, service would be interrupted temporarily.

The East CBD Bypass (part of Alternatives J and K) would serve only as a truck route. Emergency vehicle traffic would use the more efficient Pleasant Avenue route or other existing routes. Being principally a truck route, it is unlikely that the floodplain segments of Alternatives J and K would be utilized for evacuation.

The Shepard Road freeway would not cause an increase in the number of structures flooded because it would only cause a 0.1 foot rise in the 100 year flood elevation. This limited rise, combined with existing flood control facilities and the steep slope of the river valley walls assure no increase in the number of structures presently prone to flood damage (see Figure 19). The freeway will cause increased water velocities and scouring of the river bed in areas around the foundations of the Robert Street Bridge as well as several major utility crossings. This represents a significant increase in risk for damage during flood conditions.

Since Alternatives J and K will cause no measurable changes in water elevation, and only negligible increases in water velocity, they will not increase any flood risk factors.

The Shepard Road freeway would adversely affect several natural and beneficial values of the floodplain including the aquatic habitat, terrestrial vegetation and wildlife, parkland and aesthetics. Alternatives J and K would have no such effect.

In light of review of these three criteria for determination of significance, it is evident that Alternative B could be a significant longitudinal encroachment, and Alternatives J and K would not. Since no other alternatives encroach upon the floodplain, they have not been considered for significant encroachment.

Practicability of Alternatives

In consideration of the proposed I-35E link there are eleven other alternatives to Alternative B (determined to be a potential significant encroachment). These alternatives include: a no-build alternate (I), eight alternates confined within the Pleasant Avenue corridor which have no floodplain encroachment (A, A', C, D, E, F, G, H), and two alternates which utilize the Pleasant Avenue corridor for auto traffic, and construct an East CBD Bypass in combination with the existing Shepard Road for a truck bypass (Alternates J and K). This bypass does not produce a significant encroachment. All eleven of these other alternatives are feasible and are being considered for practicality in this document.

For all the above analyses, floodplain cross-sections, developed by the Minnesota Department of Natural Resource, were used and modified to include the I-35E alternatives. These cross-sections along with historical flood data gathered by the U.S. Geological Survey, were then analyzed using a standard step-backwater computer program developed by the U.S. Army Corps of Engineers.

All of the above-mentioned impacts would be classified as direct impacts.

Unavoidable Adverse Impacts

With the construction of Alternative B, unavoidable adverse impacts include: temporary disruption of many existing docking facilities; limited increase in flood damage to buildings; increased risk of scouring around the footings of the Robert Street Bridge and utility crossings; encroachment on 370 acres of floodplain and 2.5 acres of river; and the navigation channel would have to be relocated.

Short-Term/Long-Term Relationships

There are major, long-term impacts due to Alternate B on erosion and scour of the river bed and banks and the manmade structures which cross it, as evidenced by the high cost of mitigation.

Irreversible Commitment of Resources

Because of the dynamic nature of a river system, a return to the original condition after the river has adjusted to the Shepard Road freeway encroachment would again cause major impacts. In this sense, new river conditions are irreversible.

TABLE 8
WATER QUALITY

ALTERNATE	I	A	A[1]	C	D	E	F	G	H	B	J	K
LOCATION	NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY		FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION		DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY				W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD

SUMMARY MATRIX

WATER QUALITY

Standard Violations	None	None	None	None	None	None	None	None	None	None	None	None
Erosion Potential												
Low/Medium/High/ Severe	High	Low	Low	Low	Low	Low	Low	Low	Low	Severe	Medium	Medium
Groundwater Supply	No Adverse Effects	No Adverse Effects	No Adverse Effects	No Adverse Effects	No Adverse Effects	No Adverse Effects	No Adverse Effects	No Adverse Effects	No Adverse Effects	No Adverse Effects	No Adverse Effects	No Adverse Effects
Deicing Impacts	No Impact	Limited to within 100 feet of corridor										
Spills												
Number of most likely spill locations on corridor where trucks are allowed	No Change	2	2	No Change	No Change	1	1	No Change	No Change	0	1	2

WATER QUALITY IMPACTS

WATER QUALITY*

Water quality was modeled for a Shepard Road freeway (Alternative B), a Pleasant Avenue freeway (Alternative A), and a no-build (Alternative I), to determine if runoff from any of these development schemes would cause a violation of state and federal water quality standards. Although there is little to distinguish between the Pleasant Avenue alternatives in terms of water quality, the freeway alternative is considered the worst case because of its slightly higher percentage of impervious area. Minnesota Pollution Control Agency water quality standards apply to a seven-day, ten-year low flow condition. This means that the water in the Mississippi must meet these standards even when the river is flowing at a rate equal to the seven-day average least flow likely to occur in ten years.

Stormwater and Meltwater Runoff

Simulated runoff water quality was modeled using data collected by MnDOT for freeway runoff and other data published by the Metropolitan Council for highly urbanized runoff. This data includes the highest chemical loading estimates attributable to the intended uses. They also assume a storm event only on the watersheds involved. As such, they represent a worse case model. The average rainfall intensity for the area (0.1 inches per hour) was used to estimate runoff from the watersheds containing the corridor. Meltwater runoff, containing deicing chemicals, was also estimated using average melting rates for the Twin Cities area.

Tables 9 and 10 present the results of the chemical loading analysis. Several observations can be made from these tables.

1. Storm runoff quality from the corridors themselves is improved under any build alternate. (This is due to the worst case data used for both land uses.)

2. Snowmelt runoff from the corridor is degraded under any build alternate.

3. As corridor water from build alternates mixes with urban runoff from the remainder of the watershed, stormwater is generally degraded and snowmelt is generally improved. (This, again, is due to the worst case chemical loading data assumed for the various land uses.)

4. Except for copper and lead during storm runoff, when the water from the entire watershed mixes with water from the seven-day, ten-year low flow from the Mississippi, no violations of water quality standards are predicted.

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*Information on water quality was derived from "Water Quality" - Appendix J.

TABLE 9
MODEL RUNOFF WATER QUALITY FOR CORRIDOR DEVELOPMENT ALTERNATES (STORM RUNOFF)

SELECTED LOCATIONS	IMPACTS IN CORRIDOR				IMPACT AT OUTLET TO MISSISSIPPI RIVER				PREMIXING MISSISSIPPI RIVER QUALITY	IMPACT IN MISSISSIPPI RIVER				STANDARD (Only applies in the Mississippi River)
	Condition				Condition					Condition				
PARAMETER	a[1]	b[2]	c[3]	d[4]	a[1]	b[1]	c[3]	d[4]		a[1]	b[2]	c[3]	d[4]	
Ammonia as N, mg/l	0.9	0.5	0.5	0.3	0.92	0.91	0.80	0.80	0.30	0.36	0.36	0.36	0.36	1.0
Nitrate as N, mg/l	0.8	0.4	0.4	0.4	0.75	0.74	1.3	1.3	0.55	0.57	0.57	0.64	0.64	N.S.[5]
Total Phosphorus, mg/l	0.75	0.4	0.4	0.4	0.75	0.74	0.60	0.60	0.15	0.21	0.20	0.21	0.21	N.S.[5]
Chloride, mg/l	35	11	11	11	35	34	54	55	15	17	17	20	20	100
Suspended Solids, mg/l	436	79	79	79	436	424	609	622	26	64	63	99	100	N.S.[5]
BOD, mg/l	36	16	16	16	36	35	24	24	3.7	6.7	6.7	6.2	6.2	N.S.[5]
COD, mg/l	135	54	54	54	135	132	116	118	32	42	41	53	43	N.S.[5]
Chromium, ug/l	140	7.1	7.1	7.1	140	135	114	114	4	17	16	18	18	50
Copper, ug/l	115	27	27	27	115	112	103	105	10	20	20	22	22	5*
Lead, ug/l	473	410	410	410	473	457	433	452	10	53	52	65	56	50
Zinc, ug/l	225	140	140	140	225	222	329	234	12	32	31	52	39	N.S.[5]
Nickel, ug/l	115	6.8	6.8	6.8	115	111	77	78	10	20	19	18	19	N.S.[5]

1. Condition a assumes no build (Alternate I)
2. Condition b assumes Pleasant Freeway or Parkway (Alternates A, A', C, D, E, F, G, H)
3. Condition c assumes Pleasant Freeway & Shepard Bypass (Alternates J, K)
4. Condition d assumes Shepard Freeway (Alternate B)
5. No standard

*Historical Detection Limit = 10 ug/l

TABLE 10
MODEL RUNOFF WATER QUALITY FOR CORRIDOR DEVELOPMENT ALTERNATES (SNOWMELT)

SELECTED LOCATIONS	IMPACTS IN CORRIDOR				IMPACT AT OUTLET TO MISSISSIPPI RIVER				PREMIXING MISSISSIPPI RIVER QUALITY	IMPACT IN MISSISSIPPI RIVER				STANDARD (Only applies to Mississippi River)
	Condition				Condition					Condition				
PARAMETER	a[1]	b[2]	c[3]	d[4]	a[1]	b[1]	c[3]	d[4]		a[1]	b[2]	c[3]	d[4]	
Ammonia as N, mg/l	3.7	3.0	3.0	3.0	3.7	3.7	3.6	3.7	0.30	0.3	0.3	0.3	0.3	1.0
Nitrate as N, mg/l	0.8	1.1	1.1	1.1	0.8	0.8	0.8	0.8	0.55	0.6	0.6	0.6	0.6	N.S.[5]
Total Phosphorus, mg/l	0.6	1.2	1.2	1.2	0.6	0.6	0.6	0.6	0.15	0.2	0.2	0.2	0.2	N.S.[5]
Chloride, mg/l	456	4500	4500	4500	456	543	577	517	15	20	21	28	22	100
COD, mg/l	156	292	292	292	156	159	160	158	32	33	33	35	34	N.S.[5]
Chromium, ug/l	13	37	37	37	13	14	14	13	4	4	4	4	4	50
Copper, ug/l	30	183	183	183	30	33	35	32	10	10	10	10	10	5*
Lead, ug/l	340	1100	1100	1100	340	357	363	351	10	14	14	18	15	50
Zinc, ug/l	220	655	655	655	220	230	233	227	12	14	14	17	15	N.S.[5]
Nickel, ug/l	16	72	72	72	16	17	18	17	10	10	10	10	10	N.S.[5]

1. Condition a assumes no build (Alternate I)
2. Condition b assumes Pleasant Freeway or Parkway (Alternates A, A', C, D, E, F, G, H)
3. Condition c assumes Pleasant Freeway & Shepard Bypass (Alternates J, K)
4. Condition d assumes Shepard Freeway (Alternate B)
5. No standard

*Historical Detection Limit = 10 ug/l

In order to further investigate the impacts of the corridor development directly on the river, copper and lead loading from rainfall in the corridors alone was modeled with the Mississippi River. Results indicate that corridor loading would add no more than one to two parts per billion to the concentrations of copper and lead in the river due to the disproportionate size of their respective discharges.

Finally as a measure of the conservative nature of this modeling, historical data (see Table 3) indicates that rainfalls such as modeled here do not result in a rise in chemical loading anywhere close to the magnitude presented here. For these reasons, no alternative is expected to cause violation of existing state or federal standards. A discussion of erosion potential was presented in the section on geologic impacts.

Groundwater

Groundwater storm runoff is likely to be similar in quality to the surface water. Of the several groundwater systems below the corridors, only the glacial soils aquifer is likely to receive groundwater from the corridor. It does not supply any wells in the area. No adverse effects are expected. After water seeps into these soils, it flows laterally to the Mississippi where it is discharged.

In regard to deicing chemical groundwater pollution, limited literature data indicate that degradation of groundwater quality from highway deicing chemicals most commonly is a localized phenomenon and that the groundwater supplies located farther than 100 feet from the highway's edge probably would not be noticeably affected. Here again, only the glacial soils are likely to receive this infiltration. For this reason and because there are no known private or municipal wells in the higher aquifers in the area, it is concluded that there will be no adverse impacts from spring melt groundwater runoff.

Spills

Historical records of truck spills on the interstate highway system indicate that spills are most likely to occur where compound curves (a curve where the curvature increases part way through the turn) are combined with speed limit reductions. These conditions occur in the northbound exit from the Pleasant Avenue corridor to the Short Line Road, and in the northeast-bound direct connection from the Pleasant Avenue corridor to I-94. The present Shepard Road configuration (to be used in Alternatives J and K) contains similar conditions on the mainline near the Randolph Avenue intersection. These locations are indicated in Figure 19.

The pollution from chemical and oil spills would probably be local and is unlikely to contaminate water resources near the proposed action. The Minnesota Department of Transportation's procedure in case of oil or chemical spills is to first contain the spill by placing a sand ditch block on the downstream side of the spill. If possible, highway maintenance forces remove the spilled material by pumping or sponging. If it is not possible to remove the material before it soaks

into the soil, the maintenance forces remove the contaminated soil, haul it to an appropriate dump, and replace it with clean soil. The Minnesota Department of Transportation's maintenance forces automatically call the Minnesota Pollution Control Agency (MPCA) on an accident involving oil or chemical spills. The MPCA monitors the clean-ups and the impacts.

Geologic data indicates that both most-probable spill areas in the Pleasant Avenue corridor have more than 20 feet of soil, indicating that if spill material would seep into the ground, it could easily be excavated. There is also sufficient area to install retention facilities to insure isolation of the spill. The present Randolph Avenue/Shepard Road intersection is on thin soils over St. Peter sandstone. Topography also drops fast to the river, with no area to locate a retention structure. Spills in this area will be difficult to contain if they extend beyond the curbs.

Of the three most-probable spill areas Alternatives A, A^1, and K would permit trucks through two of these areas, and E, F and J would allow truck traffic through one of these areas. Alternatives C, D, G, H and I, by not changing the present truck network, would continue to conduct trucks through the Randolph intersection at a rate similar to the status quo.

Construction

The construction impacts relating to erosion and sedimentation have been discussed previously as have impacts due to construction dewatering. The other water quality impact due to new highway construction or urban development (Alternative I) is related to the application of fertilizer to establish new ground cover in areas disturbed by construction. The granular fertilizers most likely to be used are mixtures of compounds of nitrogen, phosphorus and potassium. They do not include any urea, gaseous or liquid fertilizers. On new construction projects, an analysis of the topsoil for fertility, texture, and PH determines the type and application rate of fertilizer.

Highway fertilizers, when properly applied, do not seem to represent a significant contaminant of natural waters, but they do provide a positive impact by preventing erosion and sedimentation.

All of the above impacts are direct and for the most part are short term and reversible.

TABLE 11
ECOLOGY

ALTERNATE	I	A	A[1]	C	D	E	F	G	H	B	J	K
LOCATION	NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY		FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION		DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY				W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD

Summary Matrix

	I	A	A[1]	C	D	E	F	G	H	B	J	K
Impacts to Vegetation	New natural plant communities on right-of-way.	Loss of 67 acres of grasses and other vegetation, some erosion, potential vegetation injury from runoff and spray.		Slight increase in habitat on median.	Same as C	Same as C, but with less vegetation on median.	Same as E	Same as C	Same as C	Lose 8 acres of bottomland hardwood, 5 acres of mixed hardwood, 30 acres of grassland, bluff erosion, potential vegetation injury from runoff and spray.	Same as C, plus loss of old field community north of CBD.	Same as J
Impacts to Terrestrial Wildlife	New habitat, less road kill.	Direct loss of low quality habitat, loss of additional habitat from induced development, disruption of small mammal movement, increased road kill.		Slight increase in habitat and diversity.	Same as C	Same as C with slightly less habitat.	Same as E	Same as C	Same as C	Same as A, but also increased deer kill and disrupted animal behavior.	Same as C plus loss of habitat north of CBD.	Same as J
Impacts to River Community	No Adverse Impact	No Adverse Impact	No Adverse Impact	No Adverse Impact	No Adverse Impact	No Adverse Impact	No Adverse Impact	No Adverse Impact	No Adverse Impact	Increased sediment, temporary impacts from dredge and fill, potential toxic direct runoff.	No Adverse Impact	No Adverse Impact
Impacts to Threatened or Endangered Species	No Adverse Impact	No Adverse Impact	No Adverse Impact	No Adverse Impact	No Adverse Impact	No Adverse Impact	No Adverse Impact	No Adverse Impact	No Adverse Impact	No Adverse Impact	No Adverse Impact	No Adverse Impact

ECOLOGY IMPACTS

ECOLOGY*

This portion of the I-35E study addresses impacts to terrestrial and aquatic communities associated with the Pleasant Avenue and Shepard Road corridors. Because of special regulations regarding wetland areas, and threatened or endangered species, these topics are given special treatment in the following sections of this report.

The construction of any of the proposed alternatives, with the exception of Alternative I, No-Build, will produce net adverse impacts on the ecological resources of their respective right-of-way corridors. The specific impacts expected to result from each of the twelve alternatives are summarized in Table 11.

Impacts and Mitigation Relating to Vegetation, Wildlife and Aquatic Communities

Pleasant Avenue

The specific impacts associated with the various alternatives in the Pleasant Avenue corridor differ very little from one alternative to the next. The major difference lies in the amount of new habitat created by construction of median strips of varying lengths; this difference will be of little significance to ecological resources in the corridors. Other impacts from construction activities as well as operational impacts will be essentially the same for all alternatives in the Pleasant Avenue corridor. The adverse impacts to the various ecological resources located in or adjacent to the Pleasant Avenue right-of-way include the following:

- A direct loss of low quality wildlife habitat by conversion of approximately 57 acres of existing grassland to an impervious surface.
- Temporary soil erosion after removal of vegetation.
- Disturbance and displacement of wildlife by construction noise and increased human activity.
- Additional habitat loss and disturbance as a result of highway-induced industrial, commercial and residential development.
- Possible contamination of surface waters and roadside soils from deicing chemicals, herbicides, oil and gasoline. Aerial drift of these materials in vehicle spray may have an impact on nearby vegetation.
- Loss of small wildlife during construction activities and to road kill during highway operation.
- Impairment of movement patterns of small mammals.
- Disruption of wildlife behavior patterns as a result of increased noise and traffic.

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* Information presented in this section is based on "Wetlands, Fish and Wildlife" - Appendix G. The ecology impact analysis is based upon field surveys in 1979. Where appropriate, these field studies were supplemented with interviews with recognized experts on particular wildlife species as well as literature reviews.

Shepard Road Freeway

The impact associated with the development in the Pleasant Avenue corridor will differ from the impacts associated with development of Alternative B in the Shepard Road corridor. The variations in impacts result from the differences in the existing environmental character of the two corridors. Major construction activities have already taken place in the Pleasant Avenue right-of-way so that any future development there will be affecting areas that are presently extensively disturbed. Land to be cleared and converted to highway in the Shepard Road corridor has also been disturbed but to a much lesser degree. Disruption of the forested bluffs along the existing roadway and increases in traffic volume and speeds will have impacts on areas of more valuable wildlife habitat and more diverse vegetative cover as well as on aquatic resources. Disturbance to wildlife will be greater if this corridor is developed as it supports a larger number and a higher diversity of species than the Pleasant Avenue corridor. Some disturbances to aquatic communities in the Mississippi River will result from channel dredging and filling activities required for reconstruction of the I-35E bridge.

Construction and operation of a freeway in the Shepard Road corridor will result in the following adverse impacts to ecological resources located in or adjacent to the right-of-way.

- A direct loss of approximately 8.1 acres of bottomland hardwood forest, 5 acres of mixed hardwood forest, 4 acres of old field and 30 acres of grassland by conversion of these areas to an impervious surface.
- Temporary soil erosion on the bluff after removal of vegetation.
- Indirect impacts on bottomland hardwood forest (Type 1 wetland) and its associated wildlife at the base of the bluff to the south of Shepard Road as a result of the removal of the vegetation barriers and possible soil erosion on the bluff.
- Disturbance and displacement of wildlife by construction noise and increased human activity.
- Additional habitat loss and disturbance as a result of highway-induced industrial, commercial, and residential development.
- Contamination of surface waters and roadside soils from deicing chemicals, herbicides, oil and gasoline. Aerial drift of these materials will most likely have an impact on nearby vegetation. The soils and plants in the Irvine Park, on the bluff, and on the river floodplain will be especially susceptible to impacts from this type of contamination.
- Loss of small wildlife during construction activities and to road kill during highway operation.
- Increased potential for deer-car collisions.
- Increased disruption of wildlife behavior and migration patterns as a result of disruption of the contiguous habitat that borders the Mississippi River.
- Temporary impacts on aquatic organisms in the Mississippi River from dredging and filling activities associated with reconstruction of the I-35E bridge.

Mitigation Measures

Potential impacts on vegetation, wildlife and aquatic communities as a result of construction and operation of a freeway or parkway in the Pleasant Avenue or Shepard Road corridors, can be alleviated to a certain degree by the implementation of standard mitigative measures.

The Minnesota Department of Transportation has provided a general list of mitigative practices that are used where appropriate during highway construction and operation. These include:

- preservation of trees and shrubs including snags, beyond construction limits,
- placement of a barrier at the edge of construction limits,
- immediate reparation of construction-related damage to trees and shrubs,
- use of selected plantings to benefit songbirds and other wildlife,
- use of salt-tolerant vegetation for seeding and replanting programs,
- restricted use of deicing salt,
- design and implementation of a spill contingency plan,
- and minimization of land clearing and exposure of bare soil, mulching of bare soil, and utilization of sediment traps and berms.

Wetlands

This section of the Draft EIS provides information: (1) identifying the types of wetlands associated with the Pleasant Avenue and Shepard Road corridors; (2) describing the impacts to these wetlands, (3) evaluating alternatives which would avoid these wetlands; and (4) identifying practicable measures to minimize harm to the wetlands.

Wetland Types

The dominant plant community associated with the Shepard Road corridor is bottomland hardwood forest (refer back to Figure 13). This community has been classified as a Type 1 wetland according to U.S. Fish and Wildlife Circular 39 (1971). This forest type extends from the shoreline of the Mississippi River to the bluff that parallels Shepard Road to the south. Approximately 110 acres of bottomland hardwood forest are located along the Shepard Road corridor to the east of the I-35E bridge. Dominant tree species in this area include cottonwood, willow, silver maple and elm. These species are able to tolerate both the wet and dry conditions associated with the fluctuating water levels on the floodplain.

Two Type 4 wetlands (inland deep fresh marsh) are interspersed within the floodplain forest approximately 200 yards east of the I-35E bridge and 100 yards north of the Mississippi River. These one acre ponds also associated with the Shepard Road corridor, are inundated by the river during high water. The ponds are surrounded by both mature and sapling trees. No emergent vegetation is associated with these

wetlands; however, by midsummer duckweed covers 50 to 60 percent of the open water.

There are no wetlands associated with the Pleasant Avenue corridor.

Impacts to Wetlands

Along the Shepard Road corridor the areas of bottomland hardwood forest support the greatest variety of wildlife. This habitat is the most extensive contiguous area of forest in the primary impact area. The value of this area as wildlife habitat is enhanced by such features as interspersion of shrub and forest type, large areas of mature trees that support a number of forest-interior species not found in other parts of the primary impact area, and dead trees that harbor cavity-nesting birds and mammals. Species found in this area and not in other portions of the two corridors include the eastern wood pewee, ruby-crowned kinglet, red-eyed vireo, and pileated woodpecker.

The small Type 4 wetlands to the east of the I-35E bridge are breeding areas for waterfowl, such as mallards and herons.

Impacts to wetlands due to I-35E are limited to the freeway alternative in the Shepard Road corridor (Alternative B). There would be a direct loss of approximately 8.1 acres of the bottomland hardwood forest (Type 1 wetland). In addition, there would be indirect effects on Type 1 wetland, the interspersed Type 4 wetlands, and their associated wildlife at the base of the bluff to the south of Shepard Road. These additional impacts would occur as a result of the removal of vegetative barriers and possible soil erosion on the bluff.

Significance of Wetlands

The majority of the bottomland hardwood forest east of the I-35E bridge (110 acres) and the majority of the impacted area (8.1 acres) is either currently in public ownership or proposed for acquisition, as a part of the Crosby-Hidden Falls Regional Park. The contiguous forested area provides unique opportunities for wildlife habitat conservation and recreation in close proximity to a major population center, the City of St. Paul. Crosby-Hidden Falls has been included in the regional park system by the Metropolitan Council.

Significance of Wetland Loss

In a highly urbanized area, natural vegetation types are limited to steep slopes and areas with poor drainage or susceptible to flooding. With the loss of even a small part (7.4%) of the wetlands resource in the floodplain, there would be a corresponding loss of wildlife habitat and wildlife numbers. Species experiencing the greatest impact would be those which are most poorly represented in the primary impact area as a whole. Hence, the impacts are of a more regional nature than would be the case if the wetlands were located in a largely undeveloped area.

Alternative Evaluation

Executive Order 11990 requires the consideration of practicable alternatives which avoid location of a highway facility in wetlands. Currently there are ten alternatives under consideration, plus the No-Build (Alternative I), which would avoid location in wetlands. The practicability of these alternatives is being studied as a part of the EIS process. Should Alternative B, Shepard Road freeway, be selected, a finding on the practicability of the other alternatives will be made a part of the Final EIS.

Mitigation of Wetland Impacts

Due to space restrictions between bluff and Mississippi River, the opportunities for mitigation of wetland loss are limited. Should Alternative B be selected, those measures requiring a more detailed examination would include:

1. Enhancement of existing wetlands. This might include active vegetation management as well as the creation of impoundments within disturbed areas.

2. Design modifications. Minor alignment shifts might be possible to reduce the amount of wetland lost.

3. Erosion control. Due to potentially greater impacts from infilling of wetlands with eroded soil, erosion control would require special consideration during construction and maintenance. The steepness of the slopes and increased rates of runoff could cause especially high soil delivery rates. This might require that special measures be considered during detailed project design.

Threatened and Endangered Species

Portions of the I-35E primary impact area are located within the ranges given in the U.S. Fish and Wildlife Service Red Book of the peregrine falcon, bald eagle and Higgins eye mussel. Biologists on the I-35E study team have determined that the proposed project alternatives would not adversely affect these species or their habitats based on the following:

1. Peregrine falcons. Peregrines may be sighted in the Twin Cities Metropolitan Area during spring and fall migration. However, no sightings have been made along the primary impact area of I-35E. Further, there is no current or historical evidence that bluffs within the primary impact area have ever been used for peregrine nesting or breeding. University of Minnesota raptor specialists indicate that no reintroduction attempts would be made within the primary impact area or the metropolitan area.

2. Bald eagles. As with the peregrine falcon, it is not uncommon for eagles to fly over the metropolitan area; however, use of the river corridor along the primary impact area for feeding or roosting is highly unlikely due to the heavy industrial development along the corridor.

3. Higgins eye mussel. The Higgins eye mussel was not observed during 1978 Corps of Engineers dredging studies in the Mississippi River along the primary impact area. No living mussels were found in the primary impact area.

TABLE 12
AIR QUALITY

ALTERNATE	I	A	A[1]	C	D	E	F	G	H	B	J	K
LOCATION	NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY		FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION		DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY				W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD

AIR QUALITY Direct Operational Impacts (on interstate)	Carbon Monoxide (CO) Concentrations Well Below Standards - - -

FIGURE 20

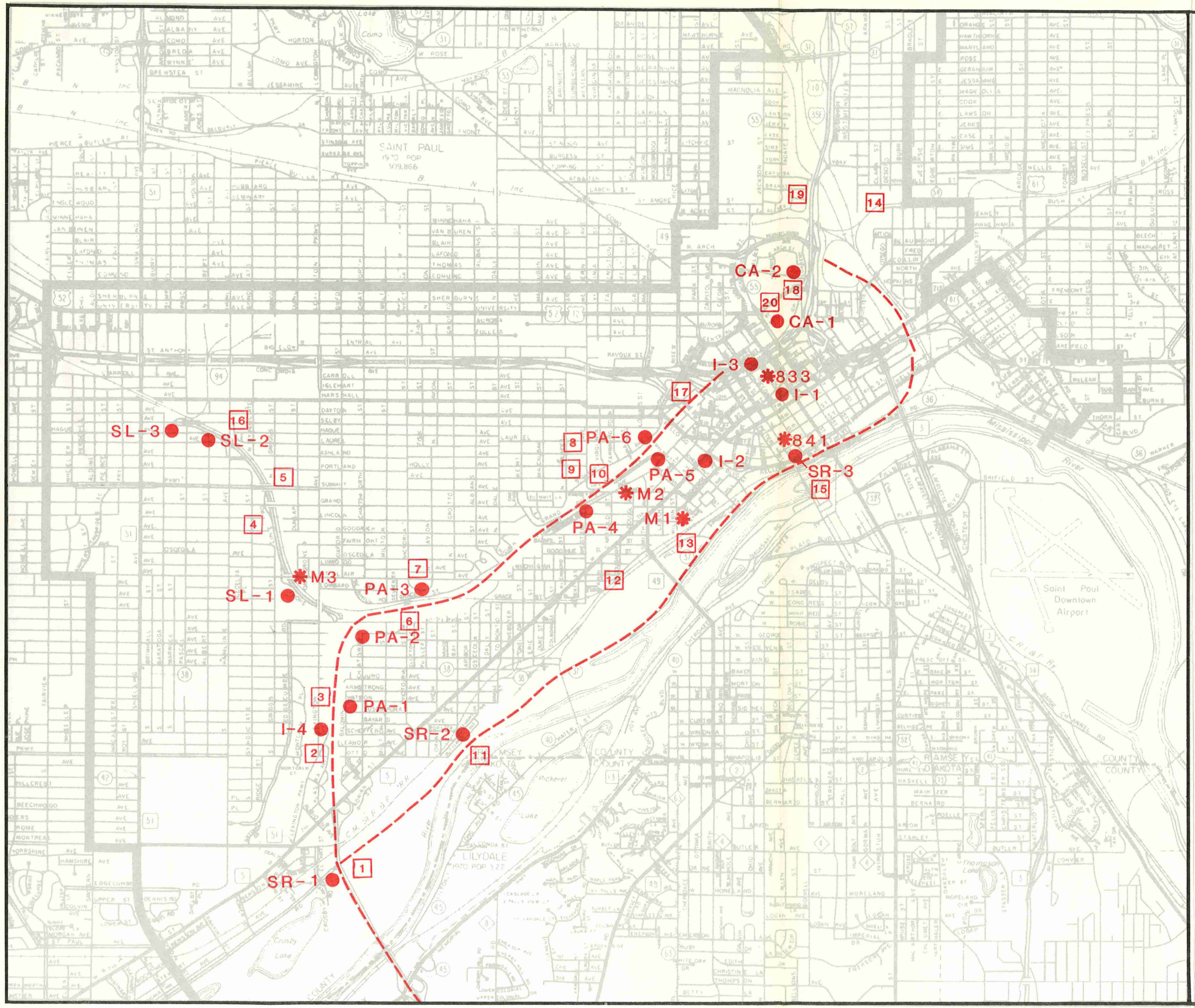
AIR AND NOISE MONITORING LOCATIONS

00 NOISE RECPTOR LOCATIONS

● CARBON MONOXIDE RECEPTOR LOCATIONS

✱ HOT SPOT CARBON MONOXIDE MONITORING SITES

– – ALTERNATIVE CORRIDORS



0 2000 4000 8000 Feet

N

135E

AIR QUALITY*

Construction

During construction there is often potential for short-term adverse effects on air quality adjacent to the construction sites. In the case of the proposed I-35E facility, potential construction impacts may be associated with:

- o emissions from construction vehicles;
- o construction-induced traffic congestion; and
- o earth work and spoils removal on the construction sites.

The Pleasant Avenue and Shepard Road corridors are 4.9 and 5.6 miles long, respectively. Furthermore, that portion of the Pleasant Avenue corridor between West Seventh Street and Western Avenue (about 4.2 miles, or 86% of the corridor) has already been cleared and graded. Overburden has been anchored to minimize losses due to wind erosion.

Although more residential units, parkland and recreational facilities are located within the Pleasant Avenue corridor, the bulk of these residences and facilities are situated above the bluff and, hence, will be shielded from fugitive dust impacts generated during construction. Practically all of the residences that are adjacent to the right-of-way and below the bluff, abut on segments of the corridor that have already been cleared and graded. Hence, these receptors will receive impacts that will be lower in both magnitude and duration, compared with similarly situated receptors along the Shepard Road corridor.

Localized dust impacts along the eastern sections of the Pleasant Avenue corridor have the potential to affect institutional property (in particular, United and Miller Hospitals and Pleasant View Nursing Home) as well as the condominium structure that was formerly Children's Hospital.

A great deal more demolition and construction is necessary on the Shepard Road freeway (Alternate B). Thus it will emit much larger quantities of dust during construction. However, because of the predominant industrial/commercial land use along this corridor, the severity of this impact is reduced.

Regardless of the alternative eventually adopted, the extent of I-35E construction impact on ambient TSP will depend heavily upon precautions taken during construction. If existing construction regulations are enforced, the impact will be minimized.

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*Impacts in this section were derived from "Air Quality Impacts" - Appendix C.

Operational Air Quality:

Regional Impacts

The Minnesota Pollution Control Agency (MPCA) has estimated that the St. Paul Central Business District (CBD) would be in compliance with federal CO standards by 1982 without any control strategies other than those already adopted and implemented. The completion of I-35E has been adopted as a component of the Metropolitan Council's Transportation Systems Management Plan.

Estimates of total vehicular pollutant burdens in the primary and secondary impact areas were made based on projected vehicle miles travelled (VMT) under each of the twelve alternatives. Predicted study area emissions and carbon monoxide (CO), nonmethane hydrocarbons (NMHC) and nitrogen oxides (NO_x) indicate a negligible variation among the twelve alternatives (including the no-build) in terms of regional emissions in the years 1990 and 2000. The difference between the no-build and the alternative that would generate the highest VMT is on the order of one percent in all cases. This implies that the introduction of the I-35E project will have a negligible effect on urban background levels of CO, NO_2 or O_3 in the study area or in the Twin Cities region as a whole.

The analysis also indicates that substantial reductions in pollutant burdens can be expected between 1979 and 1990 regardless of the alternative selected: more than a two-thirds reduction in the CO and NMHC burdens, and more than a 40% decrease in NO_x emissions in the study area. These burdens will increase slightly in the year 2000 because of projected increases in regional VMT, but will remain far below current levels.

Microscale Carbon Monoxide Impacts

Maximum one-hour and eight-hour ambient CO concentrations at eighteen selected critical receptors in the study area were forecasted for the years 1990 and 2000 under each of the twelve design alternatives, including the no-build. Receptor locations are indicated in Figure 20. There are twelve receptors of direct impact and six receptors of indirect impact. Principal selection criteria for the twelve direct impact receptors were (a) proximity to the proposed I-35E project, (b) land use sensitivity (priorty given to hospitals, schools, residences and recreational areas), and (c) geographical and land use representativeness.

Data was collected from monitoring at the receptors, and adjusted to a "worst case" condition. Data was normalized to assumed wind velocity of one meter per second, a temperature of $0^{o}F$ and a meteorological persistence factor of 0.7. This data was fed into the HW1 and HW2 computer models along with traffic data to predict CO levels for 1990 and 2000.

Estimated maximum one-hour and eight-hour CO concentrations at each receptor site are tabulated for years 1990 and 2000 in Tables 13 and 14 respectively. The CO concentrations represent the sum of the urban background component and the traffic contribution from the proposed I-35E system and/or adjacent local streets. The results indicate that: no violations of national or Minnesota CO standards will occur at any of the direct or indirect receptors in either 1990 or 2000 under any of the twelve alternatives considered.

Lead

Maximum quarterly lead concentrations were estimated for the year 1990 at each of the twelve critical primary receptors in the study area, (see Figure 20 for locations). Results indicate that ambient lead concentrations in 1990 will be extremely low, less than 10% of the federal/state standard of 1.5 ug/m^3 in all cases. No analysis was performed for the year 2000 because leaded gasoline is expected to be completely phased out by that time. It is anticipated that the pooled content of lead in gasoline will be reduced to 10% of current levels by 1990 (EPA 1979). Mandated increases in fuel efficiency, moreover, will mean that the actual reduction in lead emissions from roadway vehicles will be approximately 95%.

Mitigation

Available mitigation techniques are limited for operational pollution to rerouting of traffic via selection of other I-35E alternatives, or other traffic designs. Listed below are primary strategies for limiting pollution during the construction phase:

1. Restriction of vehicle flow on unpaved surfaces;

2. Watering twice a day during periods of high winds and construction activity;

3. Minimizing the period during which the cleared and regraded lands are exposed; and

4. Minimizing the period when spoils are stored in the immediate vicinity of the construction site.

5. Where the demolition of existing buildings that contain asbestos material is necessary, precautions should be taken in accordance with the federal regulations outlined in Federal Register No. 66, Vol. 38, April 6, 1973.

Irreversible Commitment of Resources

To the extent that the selected project alternative is permanent, an incremental percentage of relevant air quality standards will be consumed by an irreversible commitment of air quality.

TABLE 13
PREDICTED 1-HOUR AMBIENT CARBON MONOXIDE CONCENTRATIONS IN PPM** (1990/2000)

ALTERNATE	I	A	A[1]	C	D	E	F	G	H	B	J	K
LOCATION	NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY		FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION		DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY				W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD
PA-1	6.2/6.6	10.2/11.0	10.2/11.0	8.7/9.1	8.4/8.7	8.5/9.7	8.1/9.3	8.7/9.1	8.4/8.7	6.2/6.6	8.2/8.9	8.2/8.9
PA-2	6.9/7.5	8.9/9.3	9.2/9.6	7.9/8.2	7.5/7.8	7.9/8.3	7.5/7.8	7.9/8.3	7.5/7.8	6.8/7.4	6.7/7.7	6.7/7.7
PA-3	6.4/6.8	6.6/7.0	6.6/7.0	6.5/6.9	6.4/6.8	6.5/6.9	6.4/6.8	6.5/6.9	6.4/6.8	6.4/6.8	6.3/6.8	6.3/6.8
PA-4	6.2/6.6	7.7/8.2	7.8/8.5	7.2/7.6	6.9/7.2	7.2/7.6	6.9/7.2	7.2/7.6	6.9/7.2	6.2/6.6	6.7/7.1	6.7/7.1
PA-5	6.6/6.9	8.7/9.2	9.0/9.5	7.7/8.1	6.9/7.3	7.7/8.1	6.9/7.3	7.7/8.1	6.9/7.3	6.5/6.8	6.7/7.2	6.7/7.2
PA-6	6.2/6.6	7.2/7.6	7.2/7.6	6.8/7.2	6.6/7.0	6.8/7.2	6.6/7.0	6.8/7.2	6.6/7.0	6.2/6.6	6.4/6.9	6.4/6.9
SR-1	-	-	-	-	-	-	-	-	-	12/12	-	-
SR-2	10.4/10.9	9.4/9.9	9.4/9.9	9.7/10.2	9.8/10.3	9.7/10.2	9.8/10.3	9.7/10.2	9.8/10.3	11.5/12.3	10.1/10.7	10.1/10.6
SR-3	9.9/10.4	9.3/9.8	9.3/9.8	9.3/9.9	9.5/10.0	9.3/9.9	9.5/10.0	9.3/9.9	9.5/10.0	11.3/12.1	9.7/10.3	9.7/10.3
SL-1	12.6/13.2	14.6/15.4	14.6/15.4	13.3/13.9	13.3/14.1	14.4/15.2	14.4/15.3	13.3/13.9	13.3/14.1	12.4/13.1	13.5/14.3	13.8/14.7
SL-2	11.4/12.3	12.2/13.0	12.2/13.0	11.2/12.0	11.2/12.0	12.1/13.0	12.1/13.0	11.2/12.0	11.2/12.0	11.4/12.2	11.9/12.8	12.3/13.3
SL-3	12.7/13.6	14.6/15.3	14.6/15.3	12.2/13.1	12.2/13.1	14.4/15.3	14.4/15.3	12.2/13.1	12.2/13.1	12.6/12.8	14.4/15.3	15.2/15.7
I-1	13.2/14.0	-	-	-	-	-	-	-	-	13.0/13.9	-	-
I-2	16.0*/23.0*	11.2/11.7	11.2/11.7	12.3/13.2	12.9/14.0	12.3/13.1	12.7/13.7	12.3/13.2	12.9/14.0	16.8/19.9	14.1/15.4	13.9/15.1
I-3	9.1/9.7	11.1/12.1	11.1/12.1	10.5/11.2	14.0*/16.0*	10.5/11.2	14.0*/16.0*	10.5/11.2	14.0*/16.0*	9.1/9.7	12.9/16.0	12.9/16.0
I-4	11.7/12.1	11.6/12.0	11.6/12.0	11.6/12.0	11.6/12.0	11.6/12.0	11.6/12.0	11.6/12.0	11.6/12.0	11.1/12.1	10.5/11.2	10.5/11.2
CA-1	-	11.8/12.5	11.8/12.5	-	-	-	-	-	-	-	-	-
CA-2	-	-	-	-	-	10.9/11.6	-	10.9/11.6	-	-	-	-

**National Ambient CO 1-Hour Standard = 35 ppm, Minnesota CO Standard = 30 ppm. Unless otherwise indicated, calculations are based on the HIWAY 1 computer program.
PA = Pleasant Avenue
SR = Shepard Road
SL = Short Line
I = Indirect
CA = Indirect - Capitol Area
*Calculation made on the more refined HIWAY 2 computer model.

TABLE 14
PREDICTED 8-HOUR AMBIENT CARBON MONOXIDE CONCENTRATIONS IN PPM** (1990/2000)

ALTERNATE	I	A	A[1]	C	D	E	F	G	H	B	J	K
LOCATION	NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY		FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION		DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY				W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD
PA-1	2.6/2.8	4.3/4.7	4.3/4.7	3.6/3.8	3.6/3.7	3.6/4.1	3.5/3.9	3.6/3.8	3.6/3.7	2.6/2.8	3.5/3.8	3.5/3.8
PA-2	3.0/3.2	3.9/4.1	4.1/4.3	3.4/3.6	3.2/3.4	3.4/3.6	3.2/3.4	3.4/3.6	3.2/3.4	3.0/3.1	2.9/3.3	2.9/3.3
PA-3	2.7/2.9	2.8/3.0	2.8/3.0	2.7/2.9	2.7/2.9	2.7/2.9	2.7/2.9	2.7/2.9	2.7/2.9	2.7/2.9	2.7/2.9	2.7/2.9
PA-4	2.6/2.8	3.3/3.5	3.3/3.7	3.0/3.2	3.0/3.1	3.0/3.2	3.0/3.1	3.0/3.2	3.0/3.1	2.6/2.8	2.9/3.1	2.9/3.1
PA-5	2.9/3.0	4.3/4.6	4.5/4.8	3.6/3.8	3.1/3.3	3.6/3.8	3.1/3.3	3.6/3.8	3.1/3.3	2.8/2.9	3.0/3.2	3.0/3.2
PA-6	2.6/2.8	3.1/3.2	3.1/3.3	2.9/3.1	2.8/3.0	2.9/3.1	2.8/3.0	2.9/3.1	2.8/3.0	2.6/2.8	2.7/2.9	2.7/2.9
SR-1	-	-	-	-	-	-	-	-	-	4.6/4.8	-	-
SR-2	4.2/4.4	3.7/4.0	3.7/4.0	3.8/4.1	3.9/4.1	3.8/4.1	3.9/4.1	3.8/4.1	3.9/4.1	4.7/5.1	4.0/4.3	4.0/4.3
SR-3	3.8/4.1	3.6/3.9	3.6/3.9	3.6/3.9	3.7/4.0	3.6/3.9	3.7/4.0	3.6/3.9	3.7/4.0	4.7/4.9	3.8/4.1	3.8/4.1
SL-1	4.4/4.5	5.4/5.6	5.4/5.6	4.8/4.9	4.8/5.0	5.3/5.5	5.3/5.6	4.8/4.9	4.8/5.0	4.3/4.5	4.9/5.1	5.0/5.3
SL-2	3.9/4.1	4.3/4.5	4.3/4.5	3.8/4.0	3.8/4.0	4.2/4.5	4.2/4.5	3.8/4.0	3.8/4.0	3.9/4.1	4.1/4.4	4.3/4.6
SL-3	4.4/4.7	5.3/5.5	5.3/5.5	4.2/4.5	4.2/4.5	5.2/5.4	5.2/5.4	4.2/4.5	4.2/4.5	4.4/4.3	5.2/5.4	5.6/5.6
I-1	4.9/5.1	-	-	-	-	-	-	-	-	4.8/5.0	-	-
I-2	6.5*/7.2*	4.6/5.0	4.6/5.0	5.2/5.5	5.4/5.9	5.1/5.5	5.2/5.8	5.2/5.5	5.4/5.9	5.7*/6.5*	4.8*/5.4*	4.7*/5.4*
I-3	3.6/3.9	4.6/5.0	4.6/5.0	4.3/4.7	5.2*/6.6*	4.3/4.7	5.2*/6.6*	4.3/4.7	5.2*/6.6*	3.6/3.9	4.8*/5.6*	4.8*/5.6*
I-4	4.8/5.1	4.7/5.0	4.7/5.0	4.7/5.0	4.7/5.0	4.7/5.0	4.7/5.0	4.7/5.0	4.7/5.0	4.8/5.1	4.3/4.6	4.3/4.6
CA-1	-	4.7/5.1	4.7/5.1	-	-	-	-	-	-	-	-	-
CA-2	-	-	-	-	-	-	-	4.1/4.5	-	-	-	-

**National and Minnesota Ambient 8-Hour CO Standard = 9 ppm. Unless otherwise stated, calculations are based on the HIWAY 1 computer model.
PA = Pleasant Avenue
SR = Shepard Road
SL = Short Line
I = Indirect
CA = Indirect - Capitol Area
*Calculation made on the more refined HIWAY 2 computer model.

TABLE 15
NOISE

ALTERNATE	I	A	A[1]	C	D	E	F	G	H	B	J	K
LOCATION	NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY		FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION		DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY				W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD
Number of Activity Centers & Structures Where Design Noise Levels & Standards are Exceeded*												
Existing Daytime Noise Levels Exceeded by 10 dBA or More++												
On Corridor	-	85/17**	79/17	39/0	39/0	39/0	39/0	39/0	39/0	9/0	39/0	39/0
Off Corridor+	0/0	22/0	22/0	0/0	0/0	22/0	22/0	0/0	0/0	0/0	0/0	22/0
FHWA Daytime Design Noise Levels**												
On Corridor	-	134/0	41/0	0/0	0/0	31/0	39/0	0/0	0/0	25/0	0/0***	39/0***
Off Corridor	43/0	78/0	67/0	21/0	21/0	67/0	67/0	21/0	21/0	43/0	33/0	78/0
MPCA Daytime Standards												
On Corridor	-	193/0	167/0	33/0	41/0	41/0	41/0	33/0	41/0	25/0	41/0***	41/0***
Off Corridor	79/0	79/0	79/0	55/0	55/0	79/0	79/0	55/0	55/0	79/0	55/0	79/0
MPCA Nighttime Standards												
On Corridor	-	193/156	193/43	193/1	193/18	193/40	193/40	193/1	193/1	45/23	193/32***	193/40***
Off Corridor	79/79	79/79	79/79	79/33	79/33	79/79	79/79	79/33	79/33	79/79	79/33	79/79

*Year 2000, L(10), front row receptors only - data taken from Tables 8, 10 and 13 of the "Preliminary Noise Analysis Report."
**Before/After Mitigation. Any predicted noise level which does not exceed FHWA design noise levels or MPCA daytime standards by more than 12 decibels is assumed to be treatable with noise barriers.
***Includes no receptors along Shepard Road, since truck traffic would be similar to the no-build situation.

+Off corridor include Short Line and Common Section (I-35E and I-94) receptors.
++Available monitoring data is insufficient to determine the number of receptors which would experience a nighttime noise level increase of 10 dBA or more. However, it appears that along the corridors, most receptors will experience a nighttime increase of 10 dBA or more without mitigation.

NOISE IMPACTS

NOISE*

Construction Noise

Trucks and machinery used for construction produce noise which may affect some of the susceptible land use areas during the three-year construction period. The noise levels produced at a given location will vary considerably depending upon the number of pieces being simultaneously operated, the utilization factor (percent of time in operation) and the distance from a receptor to the different equipment pieces. Analysis of equipment noise levels together with consideration of typical highway construction procedures and the alternative alignments indicate that all of the susceptible areas previously identified will receive construction noise in varying degrees, which at times may be annoying and in excess of MPCA criteria.

Operational Noise

Methodology for this analysis included identification of sensitive receptors (listeners), measuring of existing noise levels, identification of existing standards and noise design criteria, and the modeling of future noise levels at these receptors due to the combination of background noise and the I-35E noise contribution. These future noise levels were predicted using the FHWA Highway Traffic Noise Prediction Model. (This model was modified by MnDOT to also calculate L(50) which relates to a local Minnesota Pollution Control Agency standard. No changes were made to normal operating routines for calculating L(10) and Leq.)

Table 15 identifies the total number of front row structures or activity centers (houses, parks, etc.) in proximity to receptor locations (identified in Figure 20) which experience exceedance of MPCA standards and FHWA design criteria. Numbers for all alternatives have been divided into values for those receptors located directly on or adjacent to the affected corridor and for those located on the Short Line Road and the Common Section of I-35E and I-94 just north of downtown. The receptor locations are presented in Figure 20.

Roadway speed and the extent to which trucks are allowed are the major influencing factors. Thus Alternative A is the noisiest because of the highest speeds and extensive truck use. Alternatives C, D, G, H, and J result in the least noise impact because of the differences in the extent of roadway which prohibits truck travel and the lower speeds allowed.

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*Material from this section is taken from the "Preliminary Noise Analysis" - Appendix D. Detailed noise level predictions by receptor are presented in Appendix B.

Total impacts resulting from a Shepard Road Freeway (Alternative B) would be in the same general range as for the parkway alternatives. Although there are fewer sensitive receptors along Shepard Road, trucks would be allowed to use the Short Line under this alternative. Thus, there are offsetting factors which tend to balance out the total impact.

A review of off-corridor impacts shows that the North Short Line area will experience peak hour traffic noise increases for all the alternatives. Predicted increases range from a maximum of approximately 10 dBA and to minimum increases of approximately 3 dBA; these values correspond to the presence or absence of trucks in the traffic stream respectively. On South Lexington a significant change in traffic noise (a decrease of approximately 10 dBA) is predicted for all alternatives except No-Build and Shepard Road (Alternatives I and B respectively). For these latter alternatives, a minor (approximately 2 dBA) increase over existing traffic noise levels is predicted.

Mitigation

The analysis of the twelve alternatives indicated that noise levels in excess of both the MPCA Noise Level Standards and FHWA Design Noise Levels would occur at many receptors. Therefore, a preliminary analysis of noise abatement strategies was conducted. Primary methods for abating exterior highway noise include traffic management; elevation, burial or depression of the highway; noise barriers; and land use controls. Modification of receptors through soundproofing and air-conditioning is another method, although it will not affect exterior levels. Thus, such interior modifications are normally reserved for special cases when other methods are infeasible or not sufficiently effective.

This analysis indicates that noise barriers are overall the most feasible noise abatement measure for any of the alternatives considered. The cost of noise barriers may range from $100 to over $200 per lineal foot depending upon the type and amount of material required. In general, for a given noise reduction, the cost of barriers is significantly lower than that associated with almost any other measures. Reductions in traffic noise, due to a barrier at community receptors bordering a highway, exhibit the following range of feasibility:

- 5 dBA - simple
- 10 dBA - attainable
- 15 dBA - very difficult
- 20 dBA - nearly impossible

The incorporation of earth berms and walls alone or in combination with roadway elevation or depression should achieve the MPCA daytime noise standards and FHWA Design Noise Levels for most of the susceptible areas identified within the proposed corridors. The achievement of MPCA nighttime noise standards may not be feasible

at all locations. This is due to the stringent nature of this particular standard when applied to the situation of traffic noise.

Based upon the above discussion and the experience gained from past noise barrier walls it was assumed for purposes of mitigation analysis that a reduction of 12 dBA was achievable. Predicted noise levels were compared to FHWA and MPCA criteria plus 12 dBA to identify the number of first row receptors for which mitigation was achievable. These preliminary results, presented in Table 13, indicate that with alternatives A and A' 17 receptors will experience noise level increases of more than 10 dBA, even with mitigation. However, these receptors will comply with all MPCA standards. All sites along the corridors, for all alternatives, have the potential for adequate mitigation with noise barriers for all daytime criteria. The achievement of either the MPCA standards or FHWA Design Noise Levels at the Children's and St. Luke's Hospitals may require interior receptor modifications such as soundproofing. However, achievement of the FHWA interior spaces design guidelines for hospitals is feasible if freeway-facing windows are kept completely closed.

The MPCA nighttime standards for residential areas are 55 dBA for L(10) and 50 dBA for L(50). Achievement of the MPCA nighttime noise standard is difficult from design and cost standpoints for the following reasons:

- The definition of nighttime includes the 6 a.m. to 7 a.m. hour period during which a portion (over 60% of peak hour) of the a.m. commuter period traffic flow occurs (the a.m. rush hour peak occurs between 7 a.m. and 8 a.m.).

- The differences in MPCA nighttime vs. FHWA limiting L(10) values is 15 dBA, whereas the approximate difference in traffic noise between the peak hour design period and the 6 a.m.-7 a.m. nighttime hour is only 2 dBA; thus a noise mitigation measure that results in meeting the FHWA design level would need to be improved by 13 additional decibels to achieve the MPCA L(10) nighttime criteria.

- The MPCA L(50) standard during nighttime hours is 50 dBA, a value that field measurements show is close to or exceeded by existing conditions. Achievement of the MPCA nighttime L(50) standard, especially during the 6 a.m. to 7 a.m. period would be extremely difficult in most areas under any alternative.

Based on this preliminary mitigation analysis, Alternatives C, D (with only slightly higher noise levels), G and H are the only alternates with the potential to comply with MPCA's nighttime standard along their corridor. This is due to their lack of truck traffic in the receptor areas. However, with mitigation or without, violations of nighttime standards will occur to a nearly equal extent on the Short Line and Common Section for all alternates including the no-build.

The Federal Highway Administration participates in cost effective mitigation to identified noise impacts; considering social, economic

and environmental effects of the proposed mitigation measures, and public input as to the degree and type of mitigation desired.

Short-Term/Long-Term Relationship

Any alternative that allows trucks in receptor areas will allow violations of MPCA's nighttime noise standard to occur.

Unavoidable Adverse Impacts

As noted above, there will be instances where the MPCA nighttime standard will be exceeded.

Irreversible Commitment of Resources

To the extent that the project alternative is permanent, an incremental percentage of allowable noise increase will be consumed by the implementation of this project.

TABLE 16

TRANSPORTATION AND TRAFFIC IMPACTS

ALTERNATE				I	A	A'	C	D	E	F	G	H	B	J	K
LOCATION				NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY					FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION					DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY							W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD
Objective	Criteria		Measure Element												
1. Travel Time Reduction	a.	Auto Travel Time (min)	- I-494 to CBD	18.8	13.5 -28*	13.8 -27	13.7 -27	13.6 -28	13.7 -27	13.6 -28	13.7 -27	13.6 -28	17.6 -6	13.7 -27	13.4 -29
			- I-494 to Midway	18.4	15.5 -16	15.5 -16	15.2 -17	15.2 -17	15.2 -17	15.2 -17	15.2 -17	15.2 -17	18.4 0	15.4 -16	15.5 -16
			- Southwest St. Paul to CBD	14.6	12.1 -17	12.5 -14	12.1 -17	11.9 -18	11.9 -18	11.8 -19	11.9 -18	11.8 -19	14.0 -4	11.9 -18	11.9 -18
	b.	VHT[1]* by Facility Type (in thousands)	- Freeways, Expressways	136.8	135.4 -1	135.4 -1	134.2 -2	134.3 -2	135.4 -1	134.3 -2	135.4 -1	134.3 -2	134.2 -2	134.7 -2	134.7 -2
			- Minor Arterial	106.3	87.7 -17	87.7 -17	88.3 -17	89.4 -16	88.3 -17	89.4 -16	88.3 -17	89.4 -16	89.9 -15	89.8 -15	89.8 -15
			Total	291.0	268.1 -8	268.1 -8	271.7 -7	271.7 -7	271.7 -7	271.7 -7	271.7 -7	271.7 -7	270.1 -7	272.5 -6	272.5 -6
2. Vehicular Travel Reduction	a.	VMT[2] by Facility Type (in thousands)	- Freeway, Expressway	5823.1	5978.6 +3	5978.6 +3	5992.7 +3	5951.9 +2	5992.7 +3	5951.9 +2	5992.7 +3	5951.9 +2	5979.2 +3	5971.5 +2	5971.3 +2
			- Minor Arterial	2555.6	2487.0 -3	2487.0 -3	2442.4 -4	2519.3 -1	2442.4 -4	2519.3 -1	2442.4 -4	2519.3 -1	2530.2 -1	2528.3 -1	2528.3 -1
			Total[2]	9353.1	9507.7 +2	9507.7 +2	9413.4 +1	9458.1 +1	9413.4 +1	9458.1 +1	9413.4 +1	9458.1 +1	9478.9 +1	9479.5 +1	9479.5 +1
	b.	MVT[3] by Screenline Crossings[1]	- Screenline 1	49,300	45,800 -7	45,800 -7	49,000 -1	49,100 0	48,700 -1	48,800 -1	50,300 +2	50,400 +2	49,200 0	48,800 -1	48,600 -1
			- Screenline 2	23,200	14,100 -39	14,100 -39	16,900 -27	15,600 -33	15,900 -31	14,600 -37	16,500 -29	15,200 -34	22,800 -2	12,100 -48	10,900 -53
			- Screenline 3	48,400	54,700 +13	54,700 +13	56,700 +17	59,900 +24	57,900 +20	61,100 +26	56,100 +16	59,300 +23	45,600 -6	58,000 +20	59,300 +23
			- Screenline 4	58,500	83,100 +42	83,100 +42	77,400 +32	66,900 +14	77,100 +32	66,600 +14	77,500 +32	66,800 +14	77,700 +33	71,900 +23	71,500 +22
			- Screenline 5	14,300	15,200 +6	15,200 +6	15,600 +9	14,700 +3	15,500 +8	14,600 +2	15,600 +9	14,700 +3	14,300 +3	17,900 +25	18,100 +27
3. Congestion Reduction	a.	LOS[4] in Corridor[5] (Percent of segments at each service level)	- LOS A and B	-	83	33	50	100	50	100	50	100	50	100	100
			- LOS C and D	-	17	67	50	0	50	0	50	0	50	0	0
			- LOS E and F	-	0	0	0	0	0	0	0	0	0	0	0
	b.	LOS[4] in Common Section (Percent of segments at each service level)	- LOS A and B	36	36	36	36	36	36	36	36	36	43	14	14
			- LOS C and D	28	36	36	36	36	36	36	36	36	36	64	64
			- LOS E and F	36	28	28	28	28	28	28	28	28	21	22	22

*Second number indicates percentage change compared to the No-Build.

[1]VHT - Vehicle Hours Traveled
[2]VMT - Vehicle Miles Traveled
[3]MVT - Motor Vehicle Traffic
[4]LOS - Level of Service - with A meaning freeflowing and F meaning long delays
[5]In Corridor - On I-35E Roadways

TABLE 16 CON'T

TRANSPORTATION AND TRAFFIC IMPACTS

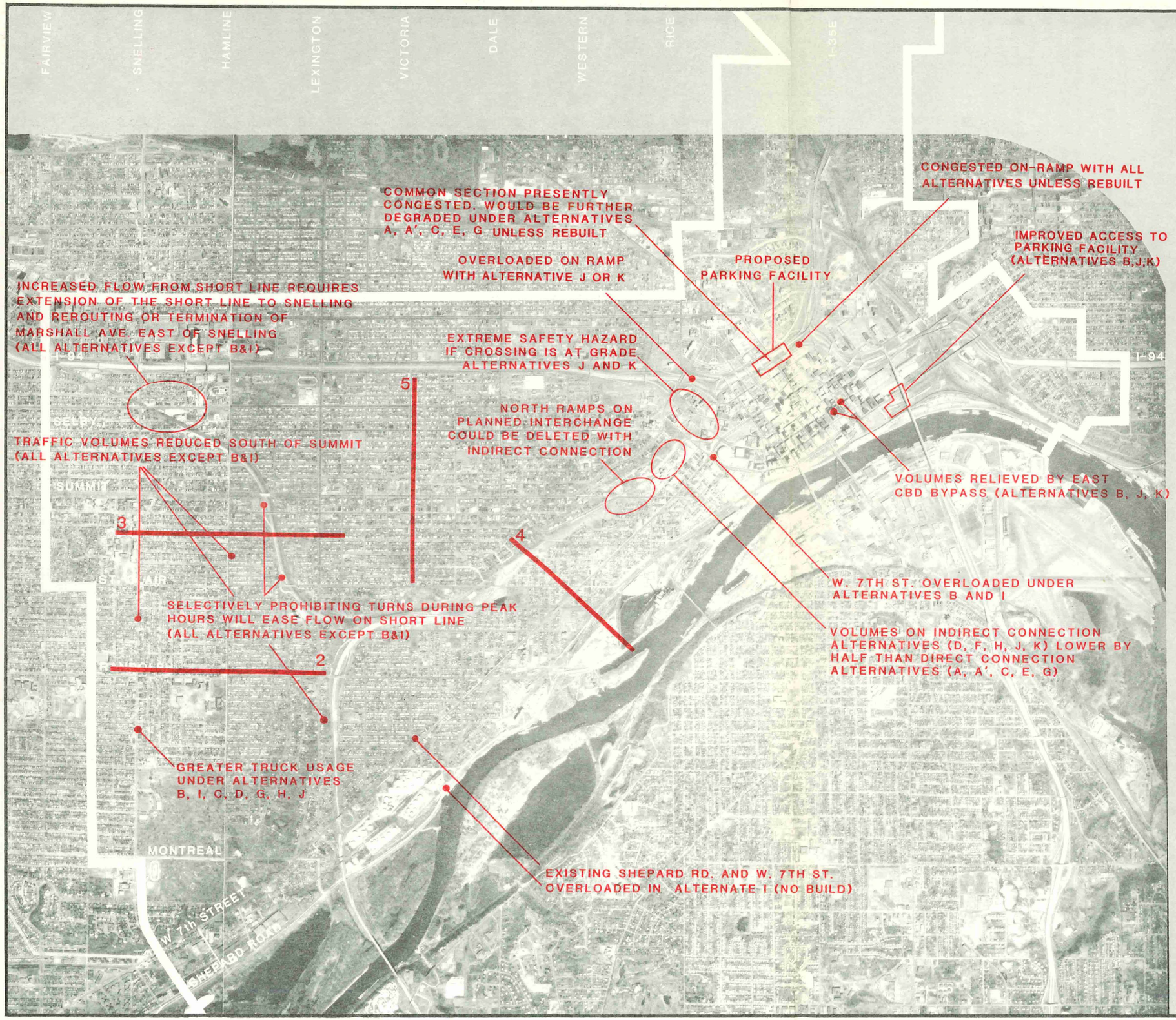
ALTERNATE			I	A	A'	C	D	E	F	G	H	B	J	K
LOCATION			NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY				FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION				DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY						W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD
Objective	Criteria	Measure Element												
4. Improved CBD Access	a. Traffic at Selected Entry Points	- I-94 (Marion, 9th 10th, 7th)	25,600	22,800	22,800	23,900	23,400	23,900	23,400	23,900	23,400	26,300	23,800	23,800
		- Pleasant Ave: Kellogg	-	3,700	3,700	3,100	3,700	3,100	3,700	3,100	3,700	-	1,100	1,100
		- W 7th Street	18,000	4,100	4,100	5,600	6,600	5,600	6,600	5,600	6,600	12,900	8,200	8,200
		- Shepard Road:												
		Chestnut	18,000	6,900	6,900	7,600	8,900	7,600	8,900	7,600	8,900	18,300	9,200	9,200
		Jackson/Sibley	7,500	4,600	4,600	4,200	5,600	4,200	5,600	4,200	5,600	14,600	2,800	2,800
		- I-35E at 10th	17,400	11,600	11,600	11,600	13,400	11,600	13,400	11,600	13,400	8,700	10,700	10,700
		Total	86,500	53,700 -38	53,700 -38	56,000 -35	61,600 -29	56,000 -35	61,600 -29	56,000 -35	61,600 -29	80,800 -7	55,800 -35	55,800 -35
5. Safety Improvements	a. Expected Accidents/yr by Facility Type[3]	- Freeway/Expressway												
		Total	4954	4939 0	5336 +8	5387 +9	5230 +6	5387 +9	5230 +6	5387 +9	5230 +6	5087 +3	5282 +7	5282 +7
		- Fwy/Exp Fatality	(37)	(36) -3	(35) -5	(36) -3	(37) 0	(36) -3	(37) 0	(36) -3	(37) 0	(36) -3	(37) 0	(37) 0
		Arterial Total	5327	5086 -5	5086 -5	5085 -5	5245 -2	5085 -5	5245 -2	5085 -5	5245 -2	5269 -1	5297 -1	5297 -1
		Arterial Fatality	(36)	(35) -3	(35) -3	(35) -3	(36) 0	(35) -3	(36) 0	(35) -3	(36) 0	(36) 0	(37) +3	(37) +3
		Total	12,310	11,998 -3	12,395 +1	12,504 +2	12,527 +2	12,504 +2	12,527 +2	12,504 +2	12,527 +2	12,376 +1	12,527 +2	12,527 +2
		Fatality	(87)	(85) -2	(84) -3	(85) -2	(87) 0	(85) -2	(87) 0	(85) -2	(87) 0	(86) -1	(87) 0	(87) 0
6. Improved Goods	a. Truck Travel Time (min)	- I-494 to CBD	16.0	10.8 -33	10.8 -33	16.0 0	16.0 0	16.0 0	16.0 0	17.5 +9	17.5 +9	15.6 -3	15.8 -1	15.8 -1
		- I-494 to Midway	20.0	15.7 -22	15.7 -22	30.0 0	20.0 0	15.7 -22	15.7 -22	25.1 +26	25.1 +26	20.0 0	20.0 0	15.7 -22
7. Improved Intermodal Coordination			Infeasible	Not Significant	Infeasible	Infeasible	Infeasible	Infeasible	Infeasible	Infeasible	Infeasible	Not Significant	Infeasible	Infeasible
8. Consistent with Metro Plans			No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9. Fulfill State and Federal Objectives			No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

1. Screenlines are identified in Figure 21.
2. Totals include local and collector streets.
3. Totals are all accidents per year. Numbers is parentheses are expected annual fatalities, included in totals.
4. Percent differences when compared with No-Build.

FIGURE 21

TRAFFIC IMPACTS

4 SCREENLINE



0 2000 4000 8000 Feet

I35E

TRANSPORTATION AND TRAFFIC*

General

Those alternatives evaluated for traffic impacts are the eleven build alternates plus the no-build alternate. The alternates do not include a NO-ACTION alternate, consisting of short-term minor reconstruction improvements. The City of St. Paul has an effective program of operational and control improvements which have been implemented in the corridor. Further improvements, if there are any acceptable ones, would not significantly increase route capacities so as to accommodate the volumes assigned to I-35E.

A Transportation Systems Management (TSM) alternate would not be appreciably different in impact from the no-build alternate. This is because the Metropolitan Council has an active TSM program of activities which would be implemented as a matter of course for metropolitan roadways, including those in either the Pleasant or the Shepard Road corridors. To be effective in eliminating the need for I-35E, added arterial lanes would be required for the full length on the parallel arterials such as Shepard Road and West Seventh. Such projects would not be TSM projects but are, rather, major new construction.

I-35E Corridor Volumes

One of the most common of the general issues is the projected daily traffic volumes by the year 2000 on selected roadways. If a direct connection is made between the proposed I-35E and I-94, the basic traffic volumes in the corridor remain essentially the same regardless of whether the facility is a freeway or a parkway. Furthermore, the volumes do not depend upon whether the parkway designation begins at West Seventh, the Short Line or I-494.

On the other hand, if an indirect connection is made from I-35E to I-94 (Alternatives D, F, H, J and K) by using the Eleventh Street and Twelfth Street pair on either side of I-94 (see Figure 5), the forecast main line volumes will be reduced by nearly 50 percent in the proposed Pleasant Avenue corridor near the CBD. The indirect connection would increase the daily traffic volume on I-94 to the west of the Common Section with I-35E by approximately 10 percent. The provision of an at-grade intersection between I-35E and the Fifth Street/Sixth Street connector (Alternatives J and K) will not additionally impede traffic volumes in the Pleasant Avenue corridor when compared to other indirect connection alternates.

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* Impacts in this section are discussed in greater detail in "Traffic Impacts" - Appendix N.

Common Section Volumes

The indirect connection alternates (D, F, H, J, K) would not add new traffic volumes to the Common Section. (See Figure 9 for location of Common Section.) Furthermore, an indirect connection eliminates the weaving movements (the situation where vehicle paths cross each other on freeway lanes) caused by directly connecting to the Common Section. This is important in view of the expectation that even with no direct connection, there will be segments which will experience some congestion during the peak hours of operation. With indirect connections, the Common Section need not be rebuilt but the three-lane continuity project on I-94 and the 35E segment north of the Eleventh Street on-ramp would have to be improved to avoid severe congestion during rush hour. If a direct connection is made, these two projects would also have to be completed to avoid localized congestion. The Common Section would be expanded as part of the Direct Connection Alternatives.

The provision of the East CBD Bypass as proposed in Alternates J and K would reduce the Common Section volumes as well as the traffic on CBD streets. Traffic from north 35E could gain access to or bypass the CBD without using the ramps or Common Section in the Capitol approach area.

Additionally, there will be congestion problems with some entrance ramps in the area of the Common Section. For example, the indirect connection Alternates J and K tend to overload the on-ramp to eastbound I-94 at John Ireland Boulevard especially under Alternates J and K. Furthermore, the northbound ramp to I-35E at Eleventh and Jackson Streets will likely experience backups during the peak hours of operation under the direct or indirect connection alternates unless the ramp is revised.

Existing Streets

Shepard Road will continue to function as a high-volume route between the I-35E bridge across the Mississippi and downtown St. Paul irrespective of any construction in the Pleasant Avenue corridor. The No-Build Alternate (I), however, will overload Shepard Road as well as West Seventh and I-94. The Shepard Road freeway (Alternate B) is expected to create problems due to additional traffic on streets in the Central Business District.

In the event that a fringe parking facility were constructed over the I-94 right-of-way, the Eleventh/Twelfth Street pair would be required to serve the access ramps to the structure as well as arterial distributors for interstate ramp traffic to the CBD irrespective of the alternate selected for the I-35E design. If an indirect connection for I-35E were selected, the frontage road volumes on Eleventh and Twelfth would be increased somewhat, causing an increase in the design problems near the proposed parking facility.

Both Hamline and Snelling Avenues will handle heavy volumes from I-94 to the Short Line for all alternatives. Snelling, however, will be expected to carry more daily traffic than Hamline Avenue.

In all alternatives except B and I, wherein the Short Line connects to the Pleasant Avenue corridor, the present Short Line terminus at Selby near Snelling will be overutilized.

East Central Business District (CBD) Bypass

The East CBD Bypass in Alternatives J and K would provide convenient routing of through trucks around the CBD, as well as to provide a higher degree of access to fringe parking around the CBD than is presently the case. The bypass would also reduce projected volumes in the Common Section and in the Pleasant Avenue corridor by approximately 5,000 vehicles per day when compared with Alternatives D, F, and H. It would relieve pressure on north-south routes in the CBD currently used by vehicles attempting to travel between Shepard Road and northbound I-35E. The bypass would also encourage heavier use of Warner Road to the east of the CBD, effectively reducing the volumes on a segment of I-94 near East Kellogg. In the event that the East CBD Bypass were built in Alternatives J or K, the projected volumes indicate that a four-lane arterial with a limited number of intersections would provide adequate capacity. The provision of the East CBD Bypass would increase the Shepard Road volumes by 8,000 to 10,000 vehicles per day when compared to the Pleasant Avenue alternatives.

Walking and Bicycling

Bike/hike trails have been included in the parkway alternatives for the Pleasant Avenue corridor. It has been recommended that a separated system consisting of a ten-foot-wide bikeway and a six-foot-wide walkway, within an approximate 30-foot-wide trail corridor, be located within and/or adjacent to the Pleasant Avenue transportation corridor. Trail development within the parkway design would provide the opportunity to integrate the roadway with the adjacent land use both functionally and aesthetically. This would serve to enhance biking and walking where no such facilities are presently available. Because of this integration, there are not expected to be any adverse impacts on walking and biking arising from the parkway alternates. The freeway alternates, on the other hand, would not provide for biking and hiking except as part of the bridges crossing the corridor. They would not be consistent with the plans for linear parks which the City of St. Paul has prepared.

Construction-Related Traffic Impacts

During construction of any of the Pleasant Avenue alternates, there are not expected to be major impacts to traffic south of St. Clair Avenue in that all planned bridges are already in place. North of St. Clair, east-west traffic would be forced to travel to West Seventh or north to Summit, Selby or I-94 in order to penetrate the downtown area. For Alternate B, Shepard Road freeway, there would be major impacts to travel in this corridor. All traffic to and from the downtown area would be forced to use West Seventh, including heavy trucks. Temporary diversion to Smith, Wabasha, Robert and Lafayette could also be expected.

Transportation-Related Objectives

Impacts can also be measured by the extent to which an alternate either exceeds or fails to attain certain objectives set out for the project. The measurement of impact, therefore, is accomplished through the selection of criteria which directly relate to the chosen objectives. Table 17 exhibits the objectives and all of the corresponding fifteen criteria used for the measurement of impacts. The first six objectives are those whose criteria lend themselves easily to quantification over each alternate. The last three objectives, however, are more meaningfully described as common to all. They will be discussed accordingly. Reference should be made to the Summary Matrix for detailed information.

The Summary Matrix (Table 16) presents the results which are arrayed to enable easy comparison with the No-Build Alternate (I). The percentage differences from the no-build are also exhibited so that one may easily identify the relative magnitudes of the differences associated with each impact type.

Auto Travel Time Reduction

The lowest totals of auto vehicle hours of travel (VHT) are associated with the two Pleasant Avenue freeway alternates: A and A' (see Table 16). The Pleasant Avenue parkway alternates C through H are equal in terms of total auto vehicle hours expended, while the Pleasant Avenue/bypass parkway alternates J and K show a slightly higher overall travel time than the Pleasant Avenue parkway alternates C through H. This increase is related to additional trips on the bypass which would not use the other alternatives. The no-build alternate shows the highest total expenditure of motorist travel time. This means that more time would be spent in travel by motorists under the no-build alternate than under any other alternate.

In terms of travel times by auto from I-494 to the CBD, the Pleasant Avenue freeway alternates offer the fastest travel times. The six Pleasant Avenue parkway alternates C through H offer intermediate service, while the Shepard Road freeway and the no-build alternate have the highest associated travel times.

The fastest service from I-494 to the Midway is provided by the Pleasant Avenue parkway alternates C through H with Pleasant Avenue/bypass parkway Alternate J offering the next best service. The Shepard Road freeway and the no-build alternate cause the travel times to be highest and accessibility to be lowest among the alternates.

The Pleasant Avenue parkway alternates F (freeway to the Short Line and parkway from the Short Line to the CBD) and H (where trucks are not allowed on I-35E entirely) offer the fastest service to the CBD from southwest St. Paul by auto because of the low-volume and high-speed type service. The freeway alternates (especially Shepard Road) offer slower service. Congestion on West Seventh and Shepard Road under the no-build alternate creates conditions where access to the CBD is quite inconvenient.

TABLE 17
OBJECTIVES AND CRITERIA FOR IMPACT MEASUREMENT

Objectives	Criteria
1. Reduce Overall Travel Time	a. Auto Travel Time from I-494/I-35E Junction to CBD b. Auto Travel Time from I-494/I-35E Junction to Midway c. Auto Travel Time from Southwest St. Paul to CBD d. Vehicle Hours Traveled (VHT) by Facility Type in Primary and Secondary Impact Areas
2. Reduce Overall Vehicle Travel	a. Vehicle Miles Traveled (VMT) by Facility Type in Primary and Secondary Impact Areas b. Motor Vehicle Traffic (MVT) Average Daily Traffic (ADT) by Selected Screenline
3. Reduce Congestion	a. Level of Service in Corridor (Percent of Segments at Each Service Level) b. Level of Service in Common Section (Percent of Segments at Each Service Level) c. MVT/ADT by Facility Type for Selected Screenlines
4. Improve Access to the St. Paul CBD	a. Ratio of Incoming Traffic at Selected Entrances to Adjacent Parking Supply b. MVT/ADT at Selected Entry Points c. Percent of Traffic Crossing Cordon Line by Facility Type
5. Improve Safety	a. Expected Annual Accidents by Facility Type in Primary and Secondary Impact Areas
6. Improve Goods Movement	a. Truck Travel Time from I-494/I-35E Junction to CBD b. Truck Travel Time from I-494/I-35E Junction to Midway
7. Improve Intermodal Coordination	Feasibility of High-Occupancy Vehicle Lanes in Corridor - General Discussion
8. Maintain Consistency with Metropolitan Transportation Plans	General Discussion
9. Fulfill Federal and State Transportation Objectives	General Discussion

Vehicular Travel Reduction

If one examines total vehicle miles traveled (VMT) over all the alternates, the lowest total is associated with the no-build alternate (see Table 16). All other alternates show a higher total VMT but the differences are not significant. Generally speaking, the more convenience a facility offers in terms of travel speeds, the greater the total VMT because drivers will drive extra distance to take advantage of higher freeway or parkway speeds.

For purposes of isolating trends in vehicular movements in various corridors, a series of screenlines were defined. Four of them (numbers 2 through 5 - number 1 was in northwest Dakota County) are shown in Figure 21. Screenline number 2, which includes Lexington, Edgecumbe, Hamline and Snelling, was selected to capture north-bound-southbound traffic west of the Pleasant Avenue corridor exclusive of the Short Line. Screenline 3, including Lexington, the Short Line, Hamline and Snelling, was intended to capture the north-south traffic inclusive of the Short Line. Screenline number 4 captures the major corridors from southwest to northeast. The roadways included are: the facility in the Pleasant Avenue corridor, Shepard Road, West Seventh, Grand Avenue and St. Clair. Screenline number 5 captures traffic on existing east-west streets, including Marshall, Dale, Selby, Summit, Grand and St. Clair.

Forecasts of traffic crossing Screenline 2 on north-south streets to the west of the Pleasant Avenue facility will be highest under the no-build situation. The next highest volumes are anticipated under Alternate B, the Shepard Road freeway, although the difference is not significant. Under both alternates (no-build and Shepard Road freeway), there would be nothing in the Pleasant Avenue corridor to divert traffic away from using these streets. The Direct Connection Pleasant Avenue parkway alternates C, E and G would reduce significantly the expected traffic volumes across this screenline compared with the no-build and Alternate B. The Indirect Connection Parkway alternates D, F and H would also exhibit significantly lower usage of these local streets compared with the no-build. The lowest usage is shown by the Pleasant Avenue/bypass parkway alternates J and K and the freeway alternates A and A'. This is because of the increasing provision of facilities from Shepard Road to the I-94/Midway area.

Analysis of traffic crossing the third screenline which includes the Short Line reveals the following observations. The parkway alternates D, F and H with indirect connection show the highest total volume of traffic crossing the screenline. Furthermore, the order of usage is dependent upon the length of the parkway. Alternate F, parkway from the Short Line to the CBD, shows the highest usage, followed by Alternate D, parkway from West Seventh to the CBD. This reflects the usage of the Short Line under Alternate F by trucks. The third highest usage is shown to be associated with Alternate H, the parkway from I-494 to the CBD. The next two rankings are shared among the parkway alternates J and K. These are followed by the direct connection alternates E, C and G. The least-traveled

alternates are, in order, alternates A, A', the no-build and the Shepard Road freeway alternate (B). These last two reflect the usage of Snelling Avenue exclusively by trucks to make north-south connections. Hence, even though the Shepard Road and no-build alternates show the highest volumes on nonlocal streets, they show the lowest overall usage of the Screenline 3 corridor which includes the Short Line.

The highest usage of the corridor represented by Screenline 4 will be by the freeway alternates A, A' and B. The next highest daily traffic totals would occur under the direct connection parkway alternates C, E and G. The indirect connection parkways with the East CBD Bypass (Alternates J and K) show the next highest totals, while the indirect connection parkway alternates D, F and H show even lower totals. The no-build alternate would exhibit the lowest total of daily crossing traffic.

The highest usage of east-west arterial streets shown by Screenline 5 north of Pleasant Avenue is shown under the indirect connection parkway (J and K). The next highest volumes are exhibited under the direct connection parkway alternates C and G, on which trucks are not allowed to use the portion between West Seventh and the Short Line. The Pleasant Avenue freeway alternate shows relatively lower usage, although the differences among the alternates are not great. Usage of east-west streets is lowest under the no-build and Shepard Road freeway alternates, with the indirect connection parkway alternate F showing low volumes as well.

The analyses of screenline crossings show that if I-35E is not built, significantly more travel on local arterials must occur. This must be considered an important adverse impact in the City of St. Paul.

Congestion Reduction

Level of service is a measure of traffic congestion during rush hour. It ranges from "A" which is good, to "F" which is bad. Level of service A is free flow with low volumes and high speeds. Level of service B and C are stable with decreasing freedom to maneuver. Level of service D approaches unstable flow with tolerable operating speeds, but is susceptible to changing conditions such as an accident or slippery condition when level of service degrades rapidly. Level of service E represents near-capacity volumes with speeds in the neighborhood of 30 miles per hour, with momentary stoppages. Level F is above capacity and usually caused by a bottleneck downstream. Stoppages are frequent and sometimes long.

Within the corridor, the indirect connection parkway alternates D, F, H, J and K show the highest overall levels of service (and thereby the lowest level of congestion). (See Table 16.) This happens as a result of lower traffic volumes during the peak hours of operation compared with those where direct connection to I-94 and I-35E takes place. The next highest levels of service are displayed by the six-lane freeway alternates A and B. The four-lane freeway (Alternate A') and the direct connection parkway alternates C, E and G show the highest expected congestion levels of all the alternates by year 2000.

Assuming the programmed improvements adjacent to the Common Section are carried out by the Minnesota Department of Transportation, the anticipated impacts on service levels in the Common Section are described in the following paragraph. Only the TH 3-Sixth Street area and the Louis-Marion ramp area have improvements programmed.

The Shepard Road freeway alternate B as well as the indirect connection parkway alternates J and K show the highest overall percentage of segments operating at levels A through D. This is logical since the Shepard Road freeway and parkway alternates J and K offer facilities to bypass the Common Section. A higher percentage of segments breaking down during the p.m. peak hour (measured by levels of service E and F) would be exhibited under the no-build alternate than either the indirect connections or the Shepard Road freeway. The direct connection alternates would route traffic through the Common Section and add higher levels of traffic during peak hours. The direct connection alternates have high levels of service in the Common Section because the Common Section would be expanded as part of these alternates.

Improved CBD Access

The criterion used to measure impacts related to this objective is the total amount of daily traffic entering downtown St. Paul at selected entry points. These were representative of all entrance locations and were documented in the Traffic Impact Report. When the no-build alternate is used as a basis of comparison, the following observations emerge as indicated in Table 16: The Pleasant Avenue freeway alternates A and A' would show the greatest reduction (38%) of traffic entering the downtown St. Paul area when compared with the no-build. This reduction, however, is not much greater than that which would occur under the direct connection parkway alternates C, E and G as well as the parkway alternates J and K with the East CBD Bypass (35%). The indirect connection alternates D, F and H would show a decrease of 29% when compared with the no-build. However, the Shepard Road freeway alternate B would show the least reduction (7%) by year 2000. This would happen because of the traffic on Shepard Road penetrating the downtown ultimately destined to the Capitol area north of the downtown area. Hence, a facility in Pleasant Avenue would tend to reduce penetration by traffic of the downtown St. Paul area.

Safety Improvements

Safety impacts are determined by percentage reductions in all accidents and fatalities associated with the various alternates compared with the no-build alternate.

The Pleasant Avenue freeway alternate A is expected to have the lowest total number of accidents of all the alternates by year 2000 (see Table 16). This is because of the highest usage of the safest facilities - the freeway. There is very little difference in total expected accidents among the remaining alternates (including the no-build). Data are not available to permit a very detailed analysis of accidents by intersection or interchange. The direct connection alternates would be expected to have a lower accident rate in the Common Section junction of I-94 and I-35E assuming the section is rebuilt. If it is not reconstructed, the accident rate would be more similar to that of the indirect connection alternates except J and K which would likely have a higher accident rate at the terminus of I-35E.

Even though the expected number of annual accidents under the indirect connection alternates is not appreciably greater than totals under those alternates where direct connections are made (see Table 16), there may be special accident or safety problems at the terminus of northbound I-35E where the indirect connection would begin. If the terminus under Alternates J and K were located at an at-grade crossing of Fifth-Sixth Streets, an extreme hazard would be created. This would arise because of the following:

1. Even if reduced speed limits were imposed, the cross section is parkway free-flow design so drivers may not expect an at-grade crossing and signals. Acceptable design would dictate that a free-flow or parkway route should not terminate at an at-grade intersection.

2. The sight distance to the intersection would be somewhat restricted by bridges.

3. The advance warning signing would have limited effectiveness.

If the indirect connection and the 35E terminus were located at a signal at St. Peter and Eleventh Street, a lesser hazard would be introduced. In this case, the roadway cross section would transition to a ramp design, more distance for deceleration is available, and advance warning signs would be more effective.

Additional safety problems could arise along Shepard Road between Chestnut and Sibley Streets under the no-build alternate. Accident rates along Shepard Road are currently not high when compared with roadways with similar design and function.

Improved Goods Movement

The effect on truck movement of parkway designation in the Pleasant Avenue corridor northeast of the Short Line is minimal (alternatives E, F, K). (See Table 16.) Access to the CBD or to the Midway area would be almost as good as that provided under a full freeway alternative. If the parkway designation were extended to West Seventh (Alternatives C, D and J), truck travel to the CBD would not be penalized, in view of the connections via West Seventh and Shepard

Road to the CBD. Truck travel to the Midway, however, would not be penalized. Trucks would be forced to use the combination of Montreal and Snelling Avenues. Snelling Avenue is the only north-south truck route in the western half of St. Paul south of I-94. It would carry all heavy truck movements if trucks were not allowed to use the Short Line. There would be dramatic negative impacts to truck travel if I-35E were designated a parkway between I-494 and the CBD (Alternatives G and H). Travel times to the CBD increase by about 9 percent and by 26 percent to the Midway.

Improved Intermodal Coordination

It is assumed that the modes of interest in this study are:

- Bus on Freeway/Parkway
- Local Bus
- Automobile - Drive Alone
- Carpool
- Vanpool

Intermodal coordination is a way of accounting for the interface among the above mentioned modes. The Federal Highway Administration has identified High Occupancy Vehicle (HOV) Treatment on all new freeway construction as a priority means for accomplishing this improvement. Therefore, the existence of HOV lanes was assumed for each of the freeway alternates, in Pleasant Avenue (A, A') and Shepard Road (B). The results of that analysis are discussed here for the Pleasant Avenue freeway alternates A and A' and for the Shepard Road freeway alternate B.

Two characteristics of this analysis are immediately apparent for all freeway alternatives: (a) the percentage of carpool riders (drivers and passengers) is very low, and (b) the percentage of transit riders is extremely high. The carpool and transit modes are, to a certain extent, competitive. If carpool ridership is low, there is a strong likelihood that transit ridership is high. However, the estimates of the total number of HOV users are accurate. Only the split between modes would be suspect.

The testing of HOV lane usage assumed a "best case" scenario as an attempt to favor transit and carpool use. The assumed line was 19 miles long, extending to I-35W in Dakota County. A speed differential of 25 mph between the HOV lanes and the regular lanes was assumed. Transit stations or ramps were assumed at all interchanges southwest of St. Clair Avenue in St. Paul. Even with these assumptions, usage of the HOV lanes was low. The number of freeway or parkway lanes could not be reduced. The data show that improved transit service can be provided in this corridor by buses in mixed traffic.

Vehicular movements indicate that the basic demand, exclusive of transit and carpool vehicles, essentially calls for four freeway lanes. If the HOV lanes were added, the required cross section would be six lanes. Alternatives C - H, J and K do not allow six lane cross sections. Thus, HOV lanes are not feasible within the framework of Alternative

A', the four-lane freeway in Pleasant Avenue, or within any of the parkway alternates. It does appear, however, that the HOV lane concept could be accommodated within the six-lane cross section, which are components of Alternate A, the six-lane freeway in Pleasant Avenue and the six-lane freeway along Shepard Road (Alternate B).

Consistency with Metropolitan Transportation Plans

The completion of I-35E has been identified as a priority item in the Metropolitan Council Transportation Policy Plan. Five reasons have been identified for its completion:

- To relieve the expected levels of vehicular congestion in Dakota and Ramsey counties by the year 2000.
- To provide for safer travel.
- To provide efficient transportation services for the residents located in the southwest sector of St. Paul and in northern Dakota County.
- To provide the accessibility required by the new and programmed development in downtown St. Paul.
- To provide a balanced regional interstate system.

Each of the build alternates would succeed in addressing each of these objectives to varying degrees. However, the more important observation is this: each of the construction alternates will conform to the Metropolitan Transportation Plan for the Ramsey County/northern Dakota County area. They will all provide greater ease of movement between the termini at I-494/I-35E and I-694/I-35E. Some alternates (the freeway and direct connection parkway alternates) will accomplish this objective to a greater extent than will the indirect connection alternates. However, the usage of local CBD streets will enable this connection to be made.

In terms of system principles and policies, principal arterials, as defined by the Metropolitan Council, should be afforded easy interchange when routes junction or cross. This is the case with I-35E and I-94 in the Capitol approach area. There is a distinct system advantage to the I35E alternates with direct connections. However, the precedent has been set at I-94 and I-35W on the east side of downtown Minneapolis that direct connections were omitted due to cost, design, and disruption problems.

By providing freeway/parkway facilities, congestion will be relieved on adjacent local streets (compared with the no-build alternate) in both Ramsey and northern Dakota Counties. Full access control (as all alternates would have except for the Alternates J and K at Fifth/Sixth Streets in the CBD) will provide a safer operating environment for motorists than if the travel were made on facilities without full access control.

By providing freeway or parkway connection from the Lexington Bridge to the CBD, more efficient travel is possible for residents desiring to travel to work locations in the CBD and to points beyond.

The provision of a highway facility connecting northern Dakota to the St. Paul CBD will provide a more balanced roadway system to residents of Southwest St. Paul and to northern Dakota County. Furthermore, the existence of such a facility will provide more balance in the provision of interregional highway service in view of the fact that planned freeway links to the St. Paul CBD are complete except for I-35E south of the CBD.

Fulfillment of Appropriate Federal and State Transportation Objectives

Those federal and state transportation objectives which directly relate to the I-35E project deal with the completion of the Interstate System. The desire to complete the interstate system is related to the conviction that interstate travel is made more convenient through the completion of the interstate system. Furthermore, the desire is related to the provision of balanced transportation service to and from the St. Paul CBD and to northern Dakota County. "Balanced" transportation service means highway service in view of the fact that all modes benefit to a certain extent from the provision of a fully controlled access facility (either freeway or parkway).

Mitigation

There appear to be four problem areas in which construction improvements may improve the flow of traffic and reduce the number of impacts associated with any of the alternates. These areas are: (a) the north end of the Short Line, (b) Shepard Road between Chestnut and Sibley, (c) the northbound on-ramp at Eleventh and Jackson, and (d) east I-94 lane continuity.

The first area is at the north end of the Short Line, where it presently merges into Selby Avenue at the Selby Avenue bridge. It is expected that problems would occur at the Selby/Snelling intersection irrespective of the chosen alternate (including the no-build) if this intersection were to continue to provide the main entry to the Short Line at its north end. Problems are expected to occur in providing sufficient capacity for turning vehicles, in maintaining sufficient curb parking for the commercial interests along Snelling Avenue, and in providing enough pedestrian clearance time for pedestrians to cross the intersection at Selby and Snelling.

Two alternative means of connecting the Short Line with Snelling Avenue have been identified. Both are variants of the same idea: The Short Line would be extended past Selby Avenue (with access to Selby preserved) in a northwesterly direction parallel to the Milwaukee Road tracks. Once the Short Line reaches the Marshall Avenue alignment, it would turn westward and connect with Snelling Avenue. The two means would differ in this respect: one plan would close Marshall Avenue to the east of the Milwaukee Road tracks and the second plan would re-route Marshall Avenue under the Milwaukee Road tracks.

The connection of the Short Line with Snelling Avenue in this fashion would greatly reduce the impacts to the Snelling/Selby intersection. In fact, most of the turning movements would be removed. Additionally, there would be sufficient pedestrian clearance time because of the displacement of the turning movements to an intersection one block to the north.

It should be pointed out that the mitigation of impacts at the Selby intersection will depend on the replacement of the Milwaukee Road Railroad Bridge across Snelling Avenue. Provided this is done (and plans are proceeding for this improvement), terminating the Short Line at Snelling and Marshall would offer a less congested intersection for turning movements. However, there would likely be significant diversion of trips to this intersection from other interchanges along the Short Line (e.g., St. Clair, Grand and Hamline). In this event, it is likely that there would be capacity problems for turning vehicles if only a single left-turn slot were available for southbound Snelling motorists desiring to turn left onto the Short Line. Storage capacity would be a problem primarily for southbound Snelling vehicles in view of the short distance between Iglehart and Marshall Avenues. The queue lengths for these left-turning vehicles in the event of a single left-turn slot would be of such a magnitude that the Iglehart intersection would become jammed during the p.m. peak hour. The need for two left-turn slots on Snelling would mean the Milwaukee Road bridge spans would have to be of sufficient length to accommodate the required cross section.

The anticipated peak hour travel on the northern end of the Short Line could be reduced without reducing major travel inconvenience if the intersections at Grand and St. Clair selectively prohibited turns during the peak hours. Moreover, the northbound Grand access ramp to the Short Line should be prohibited due to short sight distance and consequent safety problems.

The second area where construction improvements could alleviate anticipated capacity and safety problems would be along Shepard Road between Chestnut and Sibley streets. Even though it is assumed that minor improvements to Shepard Road would be required under a No-Build alternate, the presence of additional traffic including heavy trucks under Alternates J and K will likely require the provision of left-turn lanes and intersection channelization. By providing turn lanes, the expected safety problems will be reduced and roadway capacity will be increased, resulting in lower levels of congestion and faster travel times.

The third area where construction improvements could mitigate expected traffic problems is associated with the northbound I-35E on-ramp at Eleventh and Jackson streets. The peak hour year 2000 forecasts indicate a basic two-lane demand for ramp traffic. If the ramp were rebuilt to accommodate this demand, and if the basic capacity of I-35E were adjusted from a six-lane cross section to eight lanes, the existing and anticipated levels of congestion along Eleventh and Twelfth streets during the peak hours could be alleviated. Adequate capacity is available on Eleventh and Twelfth streets except for the single lane used to access the Jackson Street ramp to I-35E.

If the East CBD Bypass were constructed and indirect connections made from I-35E to I-94, the volumes on the Jackson Street ramp and the Eleventh-Twelfth one-way pair would be similar to those when a direct I-35E to I-94 connection is part of the design.

However, if the indirect connection alternate is proposed without the East CBD Bypass, the Jackson ramp and one-way arterial volumes are significantly higher so that more extensive corrective construction and a more urgent need to revise the ramp and north 35E are warranted.

Under any alternate including the no-build, revision of the design for the Eleventh and Jackson ramp will be required to improve operations in the interchange.

The fourth area where construction improvements are required to avoid rush hour congestion is the three-lane continuity project between Louis-Marion and Mounds Boulevard on I-94. This improvement provides for three-lane continuity through the Common Section.

Unavoidable Adverse Impacts

An unavoidable impact associated with the no-build alternate would be the existence of large levels of daily traffic on local city streets. In addition, a higher number of accidents will occur under the no-build alternate.

Short-Term/Long-Term Relationship

There will be no impacts unique to traffic and transportation under this section.

Irreversible Commitment of Resources

There will be no irreversible and irretrievable commitment of resources in the traffic and transportation area.

TABLE 18
LAND USE

ALTERNATE	I	A	A[1]	C	D	E	F	G	H	B	J	K
LOCATION	NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY		FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION		DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY				W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD
CONSISTENCY WITH LAND USE PLANS	Not Consistent with Regional or City Plans	Neighborhood plans are conflicting, but build options are consistent with regional and city plans.								Conflicts with River Plans	Conflicts Somewhat with River Plans	Conflicts Somewhat with River Plans
ASSOCIATED DEVELOPMENT												
Dakota County												
Improve Access to CBD	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Truck Access to Midway	No	Yes	Yes	No	No	Yes	Yes	No	No	No	No	Yes
Dakota County Growth Moved Toward St. Paul	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
St. Paul Development Promotion in:												
North of CBD	No	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes	No	No
Civic Center Area	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Western Fringe of CBD	No	No	No	No	Yes	No	Yes	No	Yes	No	Yes	Yes
Pleasant Avenue ROW	Yes	No	No	No	No	No	No	No	No	Yes	No	No
Downtown	Negative	Commercial	Commercial	Commercial	Commercial	Commercial	Commercial	Commercial	Commercial	Negative	Residential and Commercial	Residential and Commercial

LAND USE IMPACTS

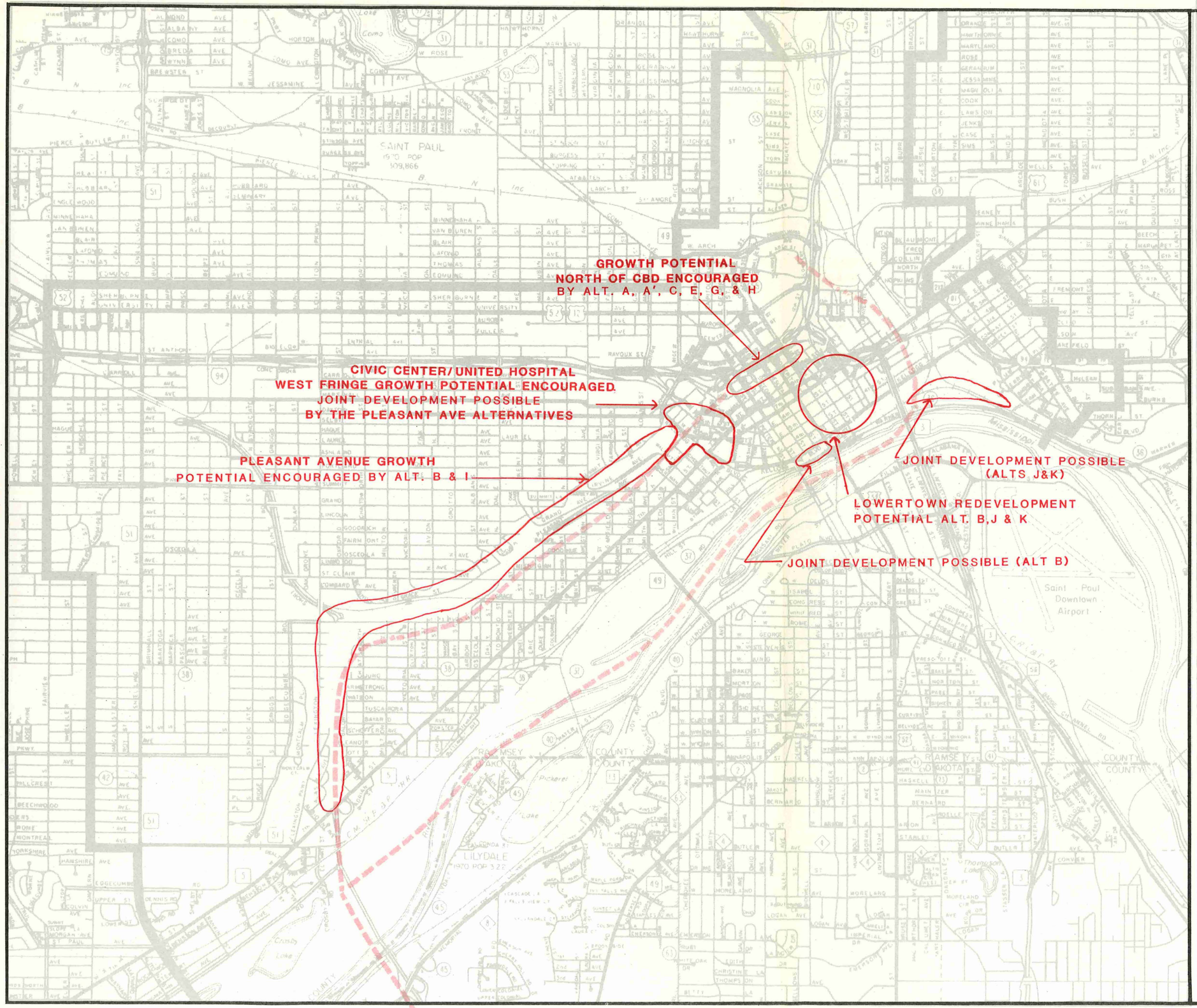


FIGURE 22

LAND USE IMPACTS

ALTERNATIVE CORRIDORS

0 2000 4000 8000 Feet

135E

LAND USE*

Plan Compatibility

Regional

The consistency of the proposed alternatives with the Metropolitan Council's Transportation Plan as well as federal and state transportation objectives have been discussed in the assessment of traffic impacts. The proposed build alternatives are consistent with the Metropolitan Council Development Framework. The entire project and any associated development is within the sewered areas of the Metropolitan Urban Service Area.

St. Paul's Land Use Plan

The City of St. Paul is in favor of reaching a decision concerning the proposed 35E interstate link. Land development induced by the roadway is consistent with city plans.

Neighborhoods

The adopted plan for Dayton's Bluff (District 4) envisions the east CBD bypass area as land developable for industrial use. The proposed bypass also limits access to the district which might inhibit economic revitalization.

The proposals are consistent with adopted plans for the Summit-University neighborhood (District 8).

For the West Seventh neighborhood (District 9), the adopted plan calls for development of the Pleasant Avenue corridor with a parkway and at-grade crossings. It also states that the corridor should have bike and pedestrian paths. In regard to the Shepard Road corridor, the plan calls for improved safety design and riverfront awareness and development of parks and a continuous green strip along the river.

The Hamline-Midway area (District 11) supports those alternatives which improve truck movement to and from their industrial park. This would include Alternatives A, A', E, F and K.

The adopted plan of Merriam Park (District 13) prefers no changes in the present status or use of the Short Line road. This position is consistent with Alternatives C, D, G, H, I and J.

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* Impacts in this section were derived from "Land Use" - Appendix P, "Neighborhood Project Response, Social Impacts" - Appendix F, and "Central Business District Economic Viability and Development" - Appendix L. All of these reports are based, among other things, on interviews with community leaders and adopted land use plans.

The Groveland-Macalester area (District 14) proposes new bike paths along the Short Line and both corridors. They favor alternatives which reduce traffic on residential streets. This would indicate a preference for Alternatives E, F and K, and a rejection of Alternative I, the no-build.

Highland Park residents (District 15) prefer Alternative A, with consideration of noise barriers and limited access.

The Summit-Hill neighborhood (District 16) prefers a parkway facility, with at-grade intersections, no trucks and an indirect connection to I-94. Alternatives, D, F, H, J and K are most similar to this position, although none of the alternatives contain at-grade intersections throughout.

St. Paul's downtown (District 17) prefers the indirect connection alternates (D, F, H, J and K) because of efficient regional "tie-in" with proposed fringe parking. Alternative B would disrupt riverfront development plans and increase auto and truck traffic in Lowertown to an undesirable level.

River Plans

Alternative B is inconsistent with St. Paul's Mississippi River Corridor Plan in that it adversely affects docking facilities, as well as aesthetic, cultural, environmental and historical values of the river, its shoreline and its floodplain. The plan proposes that Shepard Road should become a parkway. Alternatives J and K are somewhat inconsistent with this plan in that increased truck traffic on Shepard Road would conflict with the parkway concept.

The Great River Road Master Plan envisions two new parklands which are consistent with Alternatives J and K, but which conflict with Alternative B.

There does not appear to be any plan which is consistent with the mutually exclusive preferences of the affected neighborhoods. Alternative B is the only design which is inconsistent with plans for the Mississippi River.

Associated Development

The various I-35E extension alternatives have an effect on the level and direction of development in Dakota County and downtown St. Paul.

The principal difference in associated development exists between the no-build alternative and the range of I-35E build alternatives. Distinctions among the various build alternatives in terms of length, levels of access, and timesaving, are not pronounced enough to produce substantially different levels of development activity. To determine what impact the alternatives have on development potential, this section examines past development constraints in Dakota County and the availability and accessibility of development sites in St. Paul associated with alternative highway movements.

Dakota County

Several new improvements now under way are expected to stimulate increased development in Dakota County. In the past, development has been constrained by a lack of river crossings. Construction of the new Cedar Avenue Bridge has improved the accessibility to Minneapolis. The completion of any of the I-35E build alternatives will improve access to downtown St. Paul. Any of the build alternatives other than B will improve access to the industrial Midway area. Of these alternates, A, A', E, F and K will improve truck access to the Midway area. Although total growth in the county is expected to be similar under both the build and no-build alternatives, improvement of I-35E is likely to shift development activity from the western portion of the county to the northeast, around Eagen. Under the no-build option, subsequent development patterns will reinforce the suburban orientation towards Minneapolis.

One of the positive benefits to the northern Dakota County activity, if improvements to I-35E through St. Paul are made, will be the development of new neighborhoods nearby, and oriented to, St. Paul. These residents will provide additional and wider market support for downtown retail development, entertainment facilities, eating and drinking establishments, and public facilities such as museums. In this respect, all build alternates are more favorable with respect to supporting existing and encouraging future development activity in St. Paul.

St. Paul

Despite competition from suburban growth, the established bases of infrastructure, employment, and services of St. Paul's CBD have enabled it to maintain its importance as a business center. The CBD continues to attract and/or retain firms and corporations whose day-to-day functions require a central location and/or proximity to other firms with mutual or supporting interests, despite the high cost of land or less than optimal transportation access. However, with over 90 percent of its land area developed, little vacant land remains available within the St. Paul core area.

Major downtown areas outside of the core that have the potential for new, more intensive growth include the northern portion of the CBD, the Civic Center area to the west of the finiancial district, and the United Hospitals Complex close to the proposed I-94/I-35E interchange (see Figure 22). Future downtown development to the east and south is constrained by the Mississippi River, transportation barriers, and existing industrial development. Improved access along these transportation and industrial areas could open up more land for development, provided it's out of the floodplain.

Several options under consideration for the I-35E extension can be expected to affect the direction and location of development in downtown St. Paul. The direct connection with I-94, either in the form of a parkway or freeway, will promote development areas lying to the north of the commercial core. This particular area of the city

can easily be accessed from Minneapolis to the west via both I-94 and I-35E, as well as from points to the north and south, including the airport via I-35E. The location or level of development is not expected to vary between freeway and parkway design concepts.

Alternates which require use of the Pleasant Avenue corridor, either in terms of a freeway or parkway, will also open up the Civic Center area and residential areas to the west for future development. Resultant direct access to the CBD from the Minneapolis-St. Paul Airport, with an exit close to the Civic Center, will promote hotel and other development in this area.

Alternates D, F, H, J, and K provide access to the western fringe of the business district, and are likely to promote development in this area. The Shepard Road freeway (Alternate B) lacks direct access to I-94 and is less favorable to development prospects on the west and north.

Alternates B and I, which represent use of the Shepard Road freeway and the no-build alternate, respectively, will free land in the Pleasant Avenue right-of-way for development. Based on land-use plans and projections prepared by the city planning office, the development that will occur will, for the most part, be of a residential nature, with parkland and some limited parcels available for low-density commercial development.

Development of an east CBD bypass, as called for under alternates J and K, is likely to enhance residential and commercial redevelopment potential, particularly in the downtown area. The bypass would remove a portion of the truck traffic from local streets, improving the environment for residential use as proposed in the downtown redevelopment plan. The bypass also would improve accessibility to the north for industries already located along Shepard Road.

Under the no-build alternate, continued congestion, parking problems, and perceived as well as real inaccessibility in downtown St. Paul can be expected to adversely affect the absorption of existing space, as well as future development potentials over the long term.

Hotel room potentials are expected to be impacted more by future plans for the St. Paul Civic Center than by the I-35E decision. Current hotel development under way and planned will likely absorb downtown room demand over the next 10 years, with some opportunities for new development in the following decade.

Retail space is the most vulnerable element of the downtown economy, requiring transportation and transit improvements on both local and regional levels. With strong competition from existing and planned new suburban retail developments, the ability of downtown retailing to economically survive is dependent upon continued growth in the office, hotel and residential sectors, and improved access to markets. Increased congestion and inconvenient parking will deter regional and city shoppers from coming to downtown St. Paul. The city could continue to lose its share of metropolitan regional sales

unless improvements to the local and regional transportation are made.

It is clear that all alternatives will induce development, either in an abandoned corridor or on the northern and western fringe of downtown St. Paul and the northern portions of Dakota County. The development is consistent with regional and local plans, not located on the Mississippi floodplain, and would occur in areas which already have a developed infrastructure.

Joint Development

The City of St. Paul has identified several joint development potentials for both the Pleasant Avenue corridor, the Shepard Road freeway and the east CBD bypass. The development concept for the western fringe/United Hospital area are centered around the Pleasant Avenue corridor. It entails housing development to the north of the corridor connecting to hospital facilities, multimodal transportation centers and mixed use areas on the south. The connection across the corridor would be achieved by air rights development over the roadway. This aerial development would provide a transition between land uses by providing more housing, parking and open space. Such land use bridges would also reduce the adverse air and noise impacts associated with the roadway facility.

A second area for joint development exists between the Wabasha and Robert Street bridges over the Shepard Road freeway. Various plans show housing or open space in this joint development. The objective in both concepts is to mitigate the adverse visual impacts of the freeway and to maximize the recreation potential of the river.

A proposed park (part of the Great River Road program) at the junction of Warner Road, Shepard Road and the east CBD bypass has been incorporated into the interchange design for alternatives J and K. This park would also provide parking spaces for riverboat excursions now served by Lambert's Landing.

Short-Term/Long-Term Relationship

The provision of any of the build alternatives will help serve long-term vitality of St. Paul's downtown area by improving access and establishing new market areas in northern Dakota County.

Irreversible Commitment of Resources

Building any of the Pleasant Avenue alternatives (including J and K) would commit 206 new acres of urban land to transportation purposes. With all of the parkway alternatives (C, D, E, F, G, H, J and K), much of this land can also be reclaimed as active or passive open space. The Shepard Road freeway would commit 120 new acres of land to transportation use. The no-build alternative would commit 146 acres of open space to mixed use.

TABLE 19
SOCIAL

ALTERNATE	I	A	A[1]	C	D	E	F	G	H	B	J	K
LOCATION	NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY		FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION		DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY				W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD

SUMMARY MATRIX

SOCIAL

Right-of-Way Takings and Relocations												
Acres	0	1	1	1	1	1	1	1	1	120.2	51.5	51.5
Houses	0	5	5	5	5	5	5	5	5	12	5	5
Businesses	0	0	0	0	0	0	0	0	0	4	0	0
Industries	0	0	0	0	0	0	0	0	0	9	1	1
Employees	0	0	0	0	0	0	0	0	0	439	10	10
Parking Spaces	0	385*	385*	385*	385*	385*	385*	385*	385*	1370	455*	455*
Planned Industrial Sites	0	0	0	0	0	0	0	0	0	2	0	0
Developable Industrial Sites	0	0	0	0	0	0	0	0	0	25 acres	0	0
Right-of-Way Cost	0	$181,200	$181,200	$181,200	$181,200	$181,200	$181,200	$181,200	$181,200	$27,350,000	$3,653,200	$3,653,200
Public Services												
Disruption	Minimal	Minimal	Minimal	Minimal	Minimal	Minimal	Minimal	Minimal	Minimal	High During Construction	Minimal	Minimal
Emergency Access Degradation	Medium	High	High	High	Medium	High	Medium	High	Medium	High	Low	Low

*385 of these spaces are currently located upon leased highway right-of-way property.

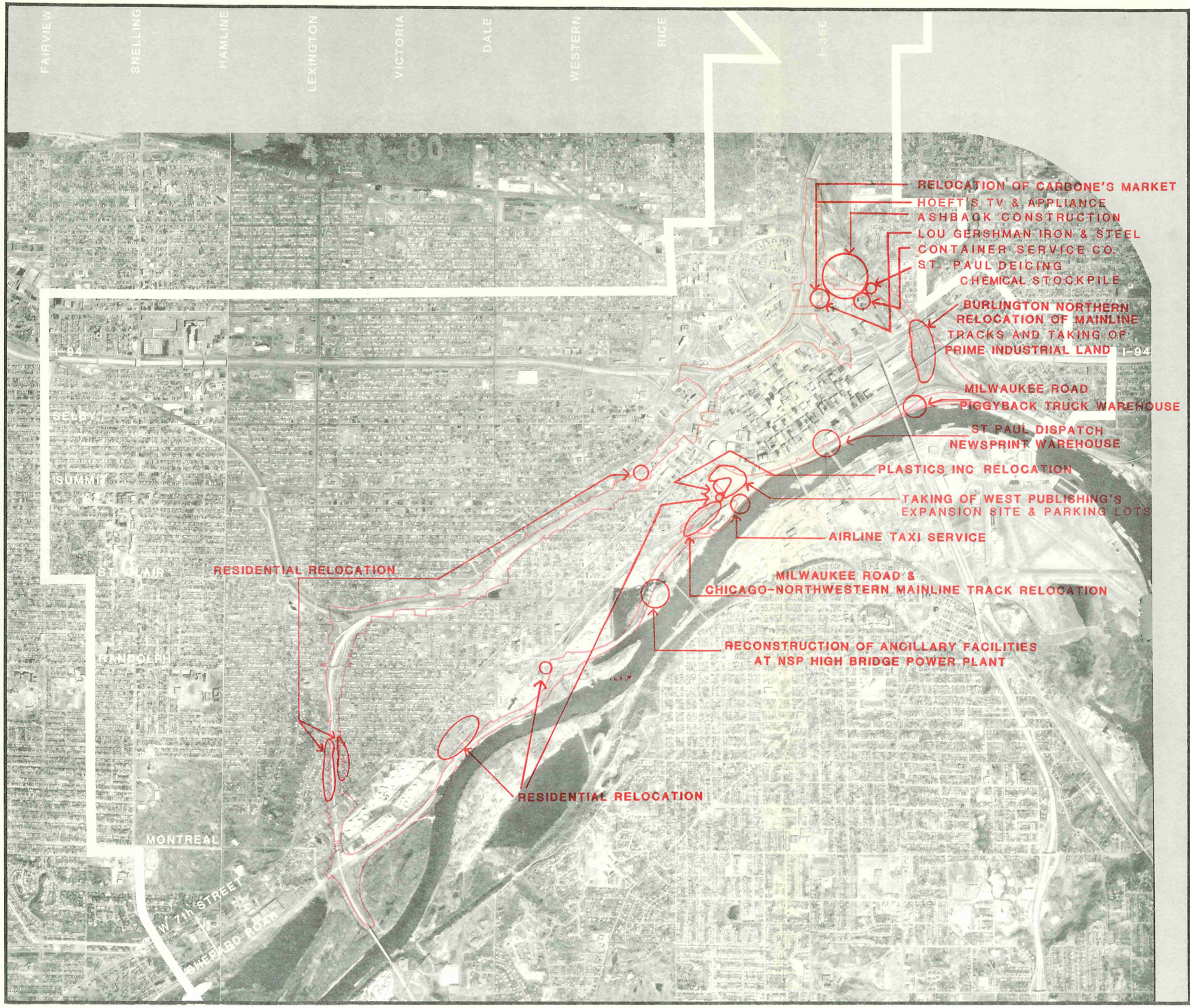
SOCIAL IMPACTS

FIGURE 23

RIGHT-OF-WAY AND RELOCATION IMPACT AREAS

SHEPARD ROAD CORRIDOR SHOWS REQUIRED RIGHT-OF-WAY.

PLEASANT AVENUE CORRIDOR SHOWS RIGHT-OF-WAY ALREADY ACQUIRED.



0 2000 4000 8000 Feet

135E

SOCIAL

Relocation*

Right-of-Way Required

The right-of-way needed for each of the proposed alternatives is shown in Figure 23. The number, type and total cost of properties taken and relocations required are indicated on the summary matrix.

Residential Property

A total of five houses will be displaced in the Pleasant Avenue corridor. This number is small because of the extensive work already done on this alignment prior to passage of the National Environmental Policy Act and the decision to write this EIS. These houses contain no minorities, and are not known to contain any handicapped or elderly. They are all owner-occupied single-family dwellings. Most of the properties are located in the southern-most third of the corridor. The housing stock is average to below average in quality. St. Paul's assessed valuation of the units ranges from $30,000 to $40,000. The total assessed value of the five houses is $170,700. The average real estate market value for these houses is $55,000. There is equivalent housing available within the same neighborhood without discrimination.

There are a total of twelve houses that would be displaced under Alternate B, the Shepard Road freeway. One family is a minority. The houses are not known to contain any handicapped or elderly. Eleven are owner-occupied while one is vacant. All are single-family dwellings. Nine of the houses to be taken are located between Bay Street and Otto along the right-of-way. The housing stock is below average to deteriorated. The average assessed value of the property and structure is $23,400. Real estate market value for these houses averages $35,000. This represents the low end of the housing market in this portion of St. Paul. However, comparable housing is available within the general area without discrimination. Relocation assistance will be provided by MnDOT District 9 Office of Right of Way. It consists of free counseling and provision of interest differential benefits, replacement housing payments and reimbursement of closing costs. This assistance is fully discussed in the section entitled "Mitigation."

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*Relocation impacts are identified in the special study, "Land Use" - Appendix D.

Commercial/Industrial Property

Specific businesses and facilities to be impacted are listed in Table 20 along with a description of the employees affected. Properties yet to be acquired were identified by comparing needed right-of-way with properties already purchased for transportation purposes.

Plastics Incorporated has by far the largest amount of employees affected. It would be displaced by Alternative B. Within their personnel are a large number of minorities and handicapped who are dependent upon transit service for commuting to and from their work. The City of St. Paul and representatives of Plastics Inc. have been discussing relocation for several years. Upgrading of the existing Chestnut intersection to an interchange has been contemplated by the city, regardless if Shepard Road is upgraded to a freeway. Being a wholesale manufacturing company, their locational needs are a proximity to major regional transportation, and their market area is wide.

Ashbach Construction is the only other displaced business with more than one minority employee. Ashbach Construction is presently mining a sand deposit on their property, with the intention of converting the land to industrial use once the sand is extracted. The mineral resource will be completely extracted prior to any I-35E construction in the area. As is the nature of most mining enterprises, it is a temporary use of the land. Consequently, their employees either move with the company, or are hired with the understanding that some day the resource will be exhausted. Because the City of St. Paul is almost entirely developed, it is improbable that the mining enterprise will relocate within the city limits. Perhaps some of the yard activities would remain within the city.

Other retail outlets such as Carbone's Market and Hoeft's TV-Appliance Co., being long established retailers in the area, have developed regular customers. Relocation within the same neighborhood may be desirable.

Taking of the NSP High Bridge expansion site could adversely affect St. Paul's district heating plan.

These relocation impacts and the displacement of these people are major, direct and unavoidable. The impacts in the Shepard Road freeway are categorically more severe. This is due to two reasons: (1) significant land use impacts (mainly residential) have already occurred in the Pleasant Avenue Corridor as the result of previous freeway construction activity and (2) major disruptions to railroad and other industrial properties would be required in the Shepard Road corridor.

As part of this study, all potentially displaced businesses were contacted as was the relocation assistance office of the City of St. Paul.

TABLE 20
Businesses and Facilities* to be Taken or Relocated

Business Facility	Alternatives	Impacts	Employees		
			Total	Minority	Handicapped
Airline Taxi Service	B	Relocated	3		
Plastics Inc.	B	Relocated	316	50	9
St. Paul Dispatch/ Pioneer Press Warehouse	B	Relocated	3		
Container Service Co.	B	Relocated	23		
Low Gershman Iron & Steel	B	Relocated	7		
Carbone's Market	B	Relocated	5		
Hoeft's TV-Appliance Co.	B	Relocated	7		
Ashbach Construction	B	Close	75	6	
Milwaukee Road Truck Terminal	J,K	Relocated	10		
NSP High Bridge Plant	B	Reconstruction of ancillary facilities			
St. Paul's Deicing Chemical Stockpile	B	Relocated			
Burlington Northern Inc.					
South Main Line (2,400 ft.)	B,J,K	Relocated			
Side Line (1,500 ft.)	J,K	Relocated			
Chicago Northwestern Bridge	B	Relocation			
Chicago Northwestern/Milwaukee Road Main Lines Combined					
(10,000 ft.)	B	Relocation			
(3,500 ft.)	J,K	Relocation			
NSP High Bridge Expansion Site	B	Taking			
West Publishing's Expansion Site	B	Taking			
Ramsey County	B	Taking of 10 parking spaces			
St. Paul Dispatch	B	Taking of 10 parking spaces			
Brooklyn Development Corp.	B	Taking of 20 parking spaces			
U.S. Post Office	B	Taking of 230 parking spaces			
Union Gospel Mission	B	Taking of 10 parking spaces			
Shell Oil Company	B	Taking of 5 parking spaces			
West Publishing	B	Taking of 1005 parking spaces			
Great Northern Railroad	J,K	Taking of 70 parking spaces			

*The taking of parklands, recreation space and historic and archeologic sites is addressed in the 4(f) section of the EIS.

Changes in Property Value

During highway construction, local residents, businesses, and industrial plants may suffer costs, lost trade, and inconvenience due to access limitations and detours.

The dust, noise, dirt, vibrations, and congestion created by machinery and trucks serving the construction areas may temporarily lower local enviornmental quality. Property values adjacent to construction sites can be temporarily depressed as a direct result of construction-related activities.*

Location theorists, realtors, and land economists have long recognized that land values are established by the real estate market through the complex interaction of a broad range of variables, some of which serve to enhance the value of a given land parcel while others act as value detractors. Among the factors which can influence property values are the availability of land, accessibility, visibility (i.e., advertising exposure), aesthetic quality of adjacent properties, noise, air pollution, tax rates, zoning regulations, and topographic features. Other important variables include the general economic health of the community; the quality of structures on the lot; the availability and quality of community services and facilities; the availability and cost of credit; as well as certain qualitative phenomena that may be considered "accidents of history". In short, there are a multiplicity of factors which interact to determine the demand for, and price of land. The net effect of these variables will be largely dependent upon the specific combination of attributes or characteristics of the land parcel and its surroundings as well as the nature of the activity actually occupying the land or intending to utilize it.

For the lack of foundation in literature, it is neither possible nor appropriate to quantitatively evaluate the potential property value impacts of the various I-35E alternatives. Although many studies have been conducted on the subject of highway effects on adjacent land values, damage functions which relate roadway characteristics to changes in land values have yet to be developed.

Although it is not possible to directly quantify the property value implications associated with each of the twelve alternatives being considered, it can be concluded that residential property values directly adjacent to the right-of-way can be depressed due to noise and aesthetic intrusion.* These impacts can be mitigated to a limited degree by noise barriers and corridor landscaping.

In other instances, property values will improve in the areas likely to develop due to improved access and mobility provided by the build alternatives. These benefits far outweigh the number of dwellings adversely affected by noise and aesthetics.

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* See special study "Neighborhood Project Response, Social Impacts" - Appendix F.

Impacts on Potentially Sensitive Groups

Besides the impacts on ethnic or racial minority, handicapped, and transit-dependent employees discussed in the relocation section, impacts on sensitive groups are expected to be minimal. Relocation of the displaced households could be somewhat difficult because the properties to be taken are at the low end of real estate values in the area.

Because both corridors exist along natural and neighborhood seams (see Figure 14) and because bridge work over the Pleasant Avenue corridor is essentially complete, construction in either corridor is unlikely to disrupt community cohesion.

Existing bus and para-transit routes are based on the present conditions which are nearly identical to the build conditions except that the mainlines and connector ramps are missing. Access to transit for the elderly and handicapped will either stay the same or improve.

Impacts on Public Services*

Isolation of Existing Service Areas by the Corridor

It is clear from Figure 15 that each corridor is located along physiographic boundaries and public service boundaries. This is an adventageous location in that service isolation outside of the corridor is minimized. All build alternatives are considered to have no adverse impact on school boundaries, or police, fire, ambulance or neighborhood isolation. The no-build alternative would create additional burden on all of these services by introducing a new residential population that would have to be assimilated into the existing community and services. Service boundaries are likely to continue to be defined by the topography of the bluff line (which parallels the Pleasant Avenue corridor to the north).

Access to health facilities will generally follow the transportation impacts. Alternatives A, A', C, D, E, F, G, H, J and K will provide improved access to hospitals and nursing homes, especially for northern Dakota County and some St. Paul neighborhoods. The no-build alternate and Alternative B will provide no improvement in health access.

Service Isolation Within the Corridor

The response time for fire protection and ambulance service within the right-of-way is of greater concern. The St. Paul Fire Department has had difficulty in getting to accidents or fires in the I-94 right-of-way because of its limited access and depressed road level. The most

* Public service impacts are discussed in Appendix F - "Neighborhood Project Response, Social Impacts."

significant problem area is in the common section where I-94 is below grade, beneath the streets of downtown St. Paul. This section has a high occurrence of traffic accidents. When accidents occur in this area, a severe traffic jam can develop; cars cannot get off the highway easily and emergency vehicles cannot get onto it without going a mile east or west to the nearest entrance. Often the traffic obstructs firetruck and ambulance access. The steep concrete and earthen walls on either side of the highway block access from other directions. As a result, firemen have resorted to climbing down ropes from the overpasses to get to the accidents and firehoses have been let down from the bridges. In addition, trucks carrying flammable gases that are heavier than air are permitted on I-94. This creates the potential for a serious accident to occur, with limited ability to respond.

All of the direct connection Pleasant Avenue alternatives (A, A', C, E, and G) will contribute to this peak hour problem by adding traffic volume, and introducing a weaving movement between eastbound I-94 and northbound I-35E. The result of added volumes and weaving movements will be more frequent accidents and greater emergency access difficulty. The indirect connection alternatives (D, E, F, J and K) will not introduce new traffic to this area. In addition, these alternatives would also provide some storage area that would be of limited utility. But the indirect connections would add traffic to Eleventh and Twelfth Streets (the frontage roads), adding congestion, and adversely affecting access to some of the hospitals and the main office of the St. Paul Police Department. All of the parkway alternatives (C, D, E, F, G and H) will also reduce the hazard by prohibiting vehicles carrying flammables or hazardous material from entering the Common Section via northbound I-35E. Although the Shepard Road freeway will not contribute to these problems, it will create some new elevated sections with problems similar to those presently experienced in the I-94 Common Section.

Public Service During Construction

The construction phase of both corridors will disrupt community services to a greater extent than the operational phase. This construction impact will be at a minimum in the Pleasant Avenue corridor because most bridge work is completed, and the corridor does not presently carry traffic. The greatest disruption would occur in the Shepard Road freeway (Alternative B).

Mitigation

Mitigation measures for right-of-way acquisition include the replacement "in kind" of properties taken, relocation counseling and financial assistance. Relocation assistance for displaced households is provided by MnDOT District 9 Office of Right of Way. This service is usually provided at their district office, but they can also provide a field office in the neighborhood of the project. Under the Federal Uniform Relocation and Assistance Act of 1970, a variety of services and assistance is provided to assure an equitable relocation. First, the property to be acquired is appraised for fair market value by an

appraiser. This service is paid for by MnDOT. Dislocated people are then given priority to purchase FHA and VA repossessed homes and public housing. The replacement housing program is designed to assure that the new home is "decent, safe and sanitary." It provides payments as high as $15,000 greater than the market value of the displaced house, if additional expenditure is necessary to guarantee decent, safe and sanitary conditions. If more than $15,000 is required, it is provided in a program called "Housing of Last Resort." The interest differential between the homeowners' old mortgage and their new one is also compensated with relocation assistance. Finally, closing costs and moving fees are paid under the authority of this Act.

Relocation for business and industry within the St. Paul city limits could be encouraged through the provision of new sites and/or available adaptable structures. The City of St. Paul provides relocation information, and maintains a listing and limited ownership of available industrial/commercial property. If a company being relocated requests assistance, the city works with them to find a comparable site. The Small Business Administration has special programs for assistance. MnDOT will provide up to $300 for an independent appraisal and will compensate for time spent finding a new location and for moving expenses. Based upon a review of available land and buildings, it appears likely that all displaced facilities could remain in the city should they choose to do so.

Relocation of employers could be based in part on employee transportation needs. Alternative parking could be provided when it is critical to continuing efficient functioning of adjoining land uses.

Adverse property value impacts resulting from construction activities could be mitigated by minimizing the total time of construction, suppression of dust and noise, and with aesthetic landscape treatment.

Unavoidable Adverse Impacts

The relocation impacts cannot be avoided. The service access problem within the corridor cannot be entirely eliminated. As stated earlier, an indirect connection or parkway alternative will not aggravate the impact, but would cause increased difficulty in accessing the police station and some hospitals. Elevated portions of Alternative B cannot be avoided, and would cause difficulties for emergency access to the mainlines. Service disruption during construction is considered minor, but unavoidable.

TABLE 21
ECONOMICS

ALTERNATE	I	A	A[1]	C	D	E	F	G	H	B	J	K
LOCATION	NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY		FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION		DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY				W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD

SUMMARY MATRIX

ECONOMICS

Direct Regional Construction-Related Income	0	$27,622,100	$26,466,200	$27,551,000	$16,587,100	$27,551,000	$16,587,100	$27,551,000	$16,587,100	$97,871,504	$21,716,200	$21,716,200
Construction Employment												
Direct (person-years)	0	704	675	702	422	702	422	702	422	2495	553	553
Total (person-years)	0	3402	3260	3391	2040	3391	2040	3391	2040	12,051	2672	2672
Average Annual Development Potential (1980-1990/1990-2000)												
Office (Net Sq.Ft.)	65,000/ 60,000	115,000/ 100,000	115,000/ 100,000	115,000/ 100,000	115,000/ 100,000	115,000/ 100,000	115,000/ 100,000	115,000/ 100,000	115,000/ 100,000	115,000/ 100,000	115,000/ 100,000	115,000/ 100,000
Hotel (Rooms)	70/27	70/35	70/35	70/35	70/35	70/35	70/35	70/35	70/35	70/35	70/35	70/35
Residential (Units)	130/160	225/235	225/235	225/235	225/235	225/235	225/235	225/235	225/235	225/235	225/235	225/235
Retail (in Millions) (1979 Constant Dollars)	$1.65/ $1.65	$4.94/ $4.94	$4.94/ $4.94	$4.94/ $4.94	$4.94/ $4.94	$4.94/ $4.94	$4.94/ $4.94	$4.94/ $4.94	$4.94/ $4.94	$4.94/ $4.94	$4.94/ $4.94	$4.94/ $4.94
Fiscal Impact on St. Paul (Net Municipal Revenues)	$300,000	$530,000	$530,000	$530,000	$530,000	$530,000	$530,000	$530,000	$530,000	$530,000	$530,000	$530,000

ECONOMIC IMPACTS

ECONOMICS*

Construction Costs and Employment

Economic impacts due to construction for each alternative are presented in Table 22. Based upon statistics compiled by the Federal Highway Administration, total construction costs (excluding right-of-way acquisition) have been disaggregated into the three major cost categories: wages; equipment, overhead and profit; and materials and supplies (see table footnotes for citation). Wages represent approximately one-fourth of total construction costs and materials and supplies represent between 40 and 50 percent of total construction costs.

Some construction expenditures will not accrue to the regional economy because portions of the labor force, materials and supplies will be imported from outside the region. These costs have been adjusted to demonstrate direct regional income, based on information provided by the Minnesota Department of Transportation. The income likely to accrue to the region for the different build alternatives ranges from an estimate of $16.6 million for the parkway alternatives, to approximately $100 million for the Shepard Road freeway alternative.

The estimated direct employment impact of the alternatives could be substantial. (See Table 22.) Employment would range from 420 person years for an indirect parkway, to 2500 person years for the Shepard Road freeway.

In addition to the direct, on-site employment impacts of the build alternatives the projects also would stimulate indirect employment growth in the region. The Federal Highway Administration has estimated that the number of off-site employment opportunities created by construction projects is equivalent to the on-site employment, based on data presented in the "Socio-Economic Impact Assessment Manual" by the Illinois Department of Transportation. In addition, there is an induced employment effect created by the income growth and expenditures resulting from the construction by a factor of three. In other words, on a national average, an estimated four jobs result from the creation of one additional on-site construction job. Since most of the labor will be drawn from the metropolitan area, this off-site and induced employment impact is likely to accrue primarily to the metropolitan region.

Tax Base Reduction

The proposals calling for development in the Pleasant Avenue corridor will require only limited land acquistion since most of the property

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*Information for this section is derived from "Central Business District Economic Viability and Development Impact" - Appendix L.

TABLE 22
DIRECT ECONOMIC IMPACTS OF CONSTRUCTION*

Alternative	Estimated Construction Costs[1] Wages[2]	Equipment and Overhead[2]	Materials and Supplies[2]	Total[3]	Direct Regional Income Wages[4]	Equipment and Overhead[5]	Materials and Supplies[6]	Total
A	$14,798,400	$16,767,600	$28,105,100	$ 59,671,100	$11,054,400	$2,515,100	$14,052,500	$27,622,100
A-1	14,179,200	16,065,900	26,929,000	57,174,000	10,591,800	2,409,900	13,464,500	26,466,200
B	52,434,300	59,411,400	99,582,800	211,428,500	39,168,400	8,911,700	49,791,400	97,871,500
C	14,760,300	16,724,400	28,032,700	59,517,500	11,026,000	2,508,700	14,016,400	27,551,000
D	8,886,500	10,068,900	16,877,100	35,832,500	6,638,200	1,510,300	8,438,600	16,587,100
E	14,760,300	16,724,400	28,032,700	59,517,500	11,026,000	2,508,700	14,016,400	27,511,000
F	8,886,500	10,068,900	16,877,100	35,832,500	6,638,200	1,510,300	8,438,600	16,587,100
G	14,760,300	16,724,400	28,032,700	59,517,500	11,026,000	2,508,700	14,016,400	27,511,000
H	8,886,500	10,068,900	16,877,100	35,832,500	6,638,200	1,510,300	8,438,600	16,587,100
I	0	0	0	0	0	0	0	0
J	11,634,400	13,182,500	22,095,900	46,912,800	8,690,900	1,977,400	11,048,000	21,716,200
K	11,634,400	13,182,500	22,095,900	46,912,800	8,690,900	1,977,400	11,048,000	21,716,200

Alternative	Estimated Construction-Generated Employment On-Site (person-years)[7]	Off-Site (person-years)[7]	Induced (person-years)[8]	Total Total
A	704	704	1,994	3,402
A-1	675	675	1,910	3,260
B	2,495	2,495	7,061	12,051
C	702	702	1,987	3,391
D	422	422	1,196	2,040
E	702	702	1,987	3,391
F	422	422	1,196	2,040
G	702	702	1,987	3,391
H	422	422	1,196	2,040
I	-	-	-	-
J	553	553	1,566	2,672
K	553	553	1,566	2,672

(1) Excludes right-of-way acquisition and is rounded to nearest $100.

(2) Cost distribution based on U.S. Department of Transportation, Federal Highway Administration, "Highway Statistics, 1973" and adjusted for relative wage and material cost increases. Distribution factors were: Wages, 25 percent; Equipment, etc., 28 percent; and Materials and Supplies, 47 percent.

(3) Source: Minnesota Department of Transportation, October, 1980.

(4) Assumes 90 percent of labor is obtained from region, based on estimate by Minnesota DOT.

(5) Assumes 15 percent of equipment is obtained from region, based on estimate by Minnesota DOT.

(6) Assumes 50 percent of materials are obtained from region, based on estimate by Minnesota DOT.

(7) Assumes 11.8 person-years of employment per million dollars of construction costs. This factor is based on figures contained in "The Environment Assessment Notebook Series," by the U.S. Department of Transportation, 1975, and has been adjusted for inflation.

(8) Assumes 33.4 person-years of employment per million dollars of construction costs.

*Source: Illinois Department of Transportation, "Socio-Economic Impact Assessment Manual," 1980 Revisions.

already has been acquired. It is estimated that additional acquisition will reduce the estimated market value of taxable property in the city by about $180,000. Since most of the property is residential, the estimated tax revenues accruing from the property at a mill rate of $120 per $1,000 of assessed value would be about $2,500 per year.

Alternates J and K which call for construction of an east St. Paul CBD bypass would not reduce the property tax base further. This is because the proposed improvements would be located within a railroad right-of-way, on tax-free land either owned by the city or the railroad.

Acquisition of property for the Shepard Road freeway would reduce the existing tax base (estimated market value) of the city by approximately $6,000,000, or reduce annual tax revenues by about $260,000. Much of this property is currently used for industrial purposes, so land acquistion would not only reduce the tax base, but may also reduce employment opportunities in St. Paul if businesses choose not to relocate in St. Paul.

Under the no-build alternate, the property within the Pleasant Avenue corridor would become available for private development. If fully developed according to the proposed land-use plan, the total estimated assessed value of this development could approach $23,000,000. This land would also be available for development under Alternate B, the Shepard Road freeway proposal.

Changes in Development Potential

In order to determine the aggregate impact of the I-35E alternates on tax revenues, it is necessary to consider the scale of development likely to occur under the alternate transportation improvements and the no-build option. Any of the build alternates is likely to stimulate continued commercial development in St. Paul, particularly in the retail and office sectors. The no-build alternate, on the other hand, would tend to constrain development potentials in these sectors. Table 23 summarizes these economic development impacts.

No substantial disparity in hotel development potential is anticipated under the no-build options. Hotel demand is most closely linked to Civic Center expansion, which is a separate issue from I-35E extension. The I-35E build alternates are likely to stimulate only marginally greater demand for hotels because of improved access to the airport.

Residential development is likely to occur under both the build and no-build scenarios. Under the no-build and Shepard Road freeway alternates, the property within the Pleasant Avenue corridor could be privately developed. Ultimately, the proposed no-build plan calls for development of nearly 1,800 dwelling units. Under the build alternates, increased commercial development implies employment growth downtown. This will increase the demand for in-town housing and is likely to stimulate residential development in or on the fringe of the CBD.

TABLE 23
ESTIMATED ANNUAL DEVELOPMENT POTENTIALS--NO-BUILD AND BUILD ALTERNATIVES (1980-2000)

Type of Development	1980-1990 No-Build Alternate	1980-1990 Build Alternate	1990-2000 No-Build Alternate	1990-2000 Build Alternate
Office (Net Sq.Ft.)				
Range	45,000-90,000	90,000-135,000	40,000-80,000	80,000-125,000
Average	65,000	115,000	60,000	100,000
Hotel (Rooms)[1]				
Range	40-100[1]	40-100[1]	25-30	30-40
Average	-	-	27	35
Residential (Units)				
Range	90-175	175-280	120-200	200-270
Average	130	225	160	235
Retail (in Millions) (1979 Constant Dollars)[2]	$1.65	$4.94	$1.65	$4.94

(1) Higher range reflects convention hotel facility whose development is dependent upon future plans for the St. Paul Civic Center.

(2) No-Build Alternate assumes a 1.0 percent share of the increase in metropolitan region sales. Build Alternate assumes CBD stabilizes and maintains a 3.0 percent share of the increase in metropolitan region sales in downtown merchandise categories (i.e., excluding automotive and hardware). In 1972, the CBD represented 2.9 percent of metropolitan region sales in these categories. Data for 1977 CBD sales were not available.

Source: Barton-Aschman Associates, Inc.

The build alternates also are projected to shift residential development in northern Dakota County toward St. Paul. Without the improvement, comparable levels of residential development may occur in the county, but the development would align along other recent highway improvements which are oriented toward Minneapolis.

In terms of retail dollars, all build alternatives will leverage annual retail development potential by 300% through the year 2000.

Net Fiscal Impacts

Since no substantial variation in residential development can be projected under the build and no-build alternates, the fiscal impact analysis focuses on differences in commercial development (including retail, office, and hotel) likely to occur under the build and no-build options. The fiscal impact analysis, compares property tax revenues generated by projected commercial development, to city costs required to serve that development. Projected commercial development under the build alternates should produce a revenue surplus (municipal revenues less expenditures) in excess of $530,000 by 1990. Under the no-build option, net municipal revenues would only be about $260,000. The difference between these revenues is less than $300,000 and represents less than one percent of total property tax revenues collected by the city each year.

Although the direct fiscal impact of the I-35E alternates may be negligible in light of the total budget, under the no-build alternate, property values may tend to erode as a larger share of the metropolitan market is attracted to competing areas, reducing incomes and, in turn, estimated assessed value. Therefore, not only would expansion of the nonresidential tax base be limited, but the value of the existing base could begin to decline. No previous studies or methodologies permit quantification of this potential impact, but the possibility warrants consideration.

Completion of I-35E is likely to stimulate considerable residential growth in Eagan. Since industrial growth is also projected to occur in Eagan, this new economic base would somewhat balance residential development and should prevent excessive fiscal burdens on this community. Adequate infrastructure also is available throughout the community, so no substantial "up front" capital investment would be required to service accelerated residential development.

Irreversible Commitment of Resources

The labor and money invested in constructing any of the build alternatives is irretrievable.

TABLE 24
VIBRATION

ALTERNATE	I	A	A^1	C	D	E	F	G	H	B	J	K
LOCATION	NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY		FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION		DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY				W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD

SUMMARY MATRIX

Structural Damage	None	None	None	None	None	None	None	None	None	None	None	None
Visual Clarity Required During Surgery	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Irritation During Construction	None	United Hospitals	United Hospitals	United Hospitals	United Hospitals	United Hospitals	United Hospitals	United Hospitals	United Hospitals	Wright-Prendergast and Breed-Blakely-Stewart Houses	United Hospitals	United Hospitals

VIBRATION IMPACT

VIBRATION

The movement of vehicles (especially large trucks and construction equipment), pile driving, and blasting send vibrations into the ground, which in turn, can shake nearby structures causing adverse impacts.

Although vibration impacts are caused by complicated interactions of many factors, their significance can be measured by damage threshold criteria and comparison to present vibrational conditions. By measuring ground vibration at greater and greater distances from the source, the area of impact can be identified, either as that area where damage thresholds are exceeded, or that area where vibration is above background level. When compared to proposed corridors, impacts on nearby structures and activities can be assessed. Such a study was conducted for this project. A detailed account can be found in the special study entitled "Vibration."

Structural Damage

In the case of all alternatives, no adverse structural impacts are to be expected during construction or operation. Sensitive structures would have to be within a few feet of the facility to be adversely impacted.

Visual Clarity Required During Surgery

All hospitals near the corridors were analyzed for possible adverse impacts relating to visual clarity during surgery and microsurgery. None of the potential generators of vibration during construction or operation are likely to adversely affect surgical procedures. Predicted vibrations are two orders of magnitude below the sensitivity threshold and one order of magnitude below existing background vibrations in the hospitals. A possible exception would be heavy blasting of rock during excavation for road grades. Such activities can be effectively controlled by mitigation, and no significant impacts of this nature are expected.

Irritation

During construction, and remembering that the data represent the worst-case vibrational conditions anticipated without mitigation (excepting blasting), some complaints should be expected from the heavy equipment operations from time to time at distances less than 200 feet or so from the area of maximum disturbance. These disturbances will be temporary, and if human receptors are not present, no significant effect is anticipated.

A possible exception to this is the United Hospital area. Under worst-case conditions and without mitigation, the hospital may experience disturbing levels of vibration from time to time during construction. Vibrations from roadway use is not likely to cause complaints.

Along the Shepard Road corridor, approximately the same conditions can be expected with regard to complaint, except that the Wright-

Pendergast and Breed-Blakely-Stewart Houses may experience disturbing vibration conditions during construction from heavy equipment operations.

Mitigation

The vibrations induced by blasting can be effectively controlled. The effects of a large blast can be broken down to a rapid series of small detonations. This is equivalent to reducing one big vibration to a series of nonadditive small vibrations. Methods are available for preestimating the maximum amount of charge to be detonated at any one time to preclude exceeding vibration levels at a given distance. The time of blasting can also be controlled to preclude interference with especially sensitive activities. Prescheduling the blast and notifying neighbors can reduce the "startle" effect.

Disturbances from the heavy equipment that will be required during construction, while of a temporary nature, will most likely have to be tolerated by those people closest to the actual construction since use of the equipment will be necessary for completion of the project. Vibrations can be monitored during construction to guide mitigation efforts on the basis of site specific data.

TABLE 25
ENERGY IMPACTS[a]

ALTERNATE	I	A	A[1]	C	D	E	F	G	H	B	J	K
LOCATION	NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY		FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION		DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY				W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD
Direct Energy	3745.3	3719.7	3719.0	3638.9	3697.2	3643.4	3701.8	3621.4	3680.1	3687.7	3710.8	3716.7
Indirect Energy (total)	2816.4	2859.3	2858.5	2815.8	2815.6	2814.2	2814.0	2804.1	2803.9	2863.7	2862.1	2830.0
Roadway Construction[b]	0	13.3	12.7	13.1	7.5	13.1	7.5	13.1	7.5	43.8	10.6	10.6
Roadway Maintenance	0	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.9	0.9	0.9
Vehicle Construction	859.2	851.3	851.3	836.2	838.5	836.2	838.5	836.2	838.5	842.1	840.9	840.9
Vehicle Maintenance	1957.2	1994.0	1994.0	1966.0	1969.1	1964.4	1967.5	1954.3	1957.4	1976.9	1973.7	1977.6
TOTAL ENERGY	6561.7	6579.0	6577.5	6454.7	6512.8	6457.6	6515.8	6425.5	6484.0	6551.4	6536.9	6546.7
TOTAL ENERGY PER 1000 VMT[c]	1.90	1.88	1.88	1.88	1.88	1.88	1.89	1.87	1.88	1.89	1.89	1.89

a) Year 2000, in thousands of barrels of crude oil per year.
b) The energy cost of upgrading the "common section" of I-94 and I-35 is 8.3 thousands of barrels of oil.
c) Measure of intensity in barrels of oil per thousand vehicle-miles of travel (bbl. per 1000 VMT).

ENERGY IMPACTS

ENERGY*

The material presented in this summary follows the guidelines contained in the June 23, 1980 memorandum (HED-05) from the Regional Administrator of the Federal Highway Administration (FHWA). In keeping with these guidelines, this energy summary report addresses "the significant direct and indirect energy impacts of the project alternatives." Direct energy is the energy required to operate and use the facility. Indirect energy, on the other hand, is the energy required to construct and maintain the facility, the energy that results from induced land use changes or mode splits, and the energy required to produce new cars or maintain cars in the fleet as their use is accelerated or slowed by alternatives.

The methodology used for estimating the energy impacts closely follows the techniques outlined in the National Cooperative Highway Research Program (NCHRP) Project 20-7, "Energy and Transportation Systems."

Direct and Indirect Energy Impacts

Table 25 presents a summary of energy impacts for the design year 2000. This table does not include the indirect energy that results from induced land use changes or mode splits. These will be examined later.

In terms of total energy, the maximum fuel consumption (within the study area) is experienced by the Pleasant Avenue freeway (Alternate A), with 6,579,000 barrels of oil per year. However, when consumption is measured by intensity of use (i.e., barrels of oil per thousand vehicle-miles of travel, bbl per 1000 VMT) then the No-Build Alternate (Alternate I) experiences the highest expenditure of fuel per distance traveled among the alternatives (1.90 bbl per 1000 VMT). Having said this, it must be pointed out that the difference in total fuel consumption within the study area between alternatives is very small. To illustrate, Alternate G (parkway with direct connection and no trucks on Short Line) exhibits the lowest total energy use as well as the lowest consumption per vehicle-miles of travel (6,425,500 barrels of oil per year and 1.87 barrels of oil per 1000 VMT respectively). Comparison of minimum and maximum energy expenditure (Alternates G and A, respectively) reveals a difference of 153,500 barrels of oil per year, which is equivalent to a 2.4 percent difference. Comparison of minimum and maximum fuel use intensity (alternates G and I, respectively) shows a difference of 1.6 percent.

Given the level of accuracy of the data used to arrive at energy use, it must be concluded that all alternates consume essentially the same amount of energy.

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* This discussion is based on "Energy Impact" - Appendix S.

Table 26 compares total energy (direct and indirect) consumption for each alternate over the life of the project. These figures assume a 30-year life and 1990 as the estimated year of completion.

Comparison of maximum and minimum total energy consumption for the life of the project (Alternates A and I, respectively) shows once again that there is essentially no differences among the alternates. Alternate I (No-Build) consumes 196,124,200 equivalent barrels of crude oil, while Alternate A (Pleasant Avenue freeway) consumes 196,641,300 equivalent barrels of crude oil. The difference between maximum and minimum fuel consumption represents a difference of 2.1 percent. If instead of total energy, one looks at direct energy (i.e., fuel consumed) the difference is 3.4 percent.

Impacts of High Occupancy Vehicle (HOV) Lanes

The Metropolitan Council has tested the impact on travel of including HOV lanes in the Pleasant Avenue corridor and in the Shepard Road corridor. Since, as a regional policy, transit use to the CBD is to be encouraged, the input parameters used in the Metropolitan Council's models for testing HOV lanes favored transit and car pools.

Comparison of morning peak-hour and directional assignment with and without HOV lanes shows that the maximum reduction in vehicular travel that could be expected with the HOV treatment is 830 vehicles per hour in the Pleasant Avenue corridor. A smaller reduction is obtained in the Shepard Road corridor.

Even though transit patronage is high when HOV lanes are assumed, the effect on total vehicular movement is not sufficient to reduce the basic number of four traffic lanes required in the corridor. Conversely, if HOV lanes are to be accommodated, a six-lane section would be required. Thus, the HOV lane concept appears feasible only in the freeway Alternates A (Pleasant Avenue corridor) and B (Shepard Road corridor).

In determining the energy impacts of providing HOV lanes, these factors are taken into account: decreased auto vehicle-miles, increased transit vehicle-miles, roadway construction and maintenance energy cost, decreased vehicle-related energy costs.

A significant portion of the increased roadway construction and maintenance cost results from the addition of two HOV lanes south of West Seventh (Alternate A) and Shepard Road (Alternate B). The resulting energy impacts of HOV lanes represent net energy savings, and are shown in Table 27.

TABLE 26
ENERGY CONSUMPTION OVER LIFE OF PROJECT[a]

ALTERNATE	I	A	A[1]	C	D	E	F	G	H	B	J	K
LOCATION	NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY		FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION		DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY				W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD

IMPACT

Direct Energy	111,942.9	111,177.7	111,156.8	108,762.7	110,505.2	108,897.2	110,642.7	108,239.6	109,994.1	110,221.3	110,911.7	111,088.0
Indirect Energy	84,481.3	85,463.6	85,439.7	84,163.4	84,157.4	84,115.6	84,109.6	83,813.7	83,807.7	85,595.1	84,471.3	84,587.8
TOTAL ENERGY	196,124.2	196,641.3	196,596.5	192,926.1	194,662.6	193,012.8	194,752.3	192,053.3	193,801.8	195,816.4	195,383.0	195,675.8

a) In thousands of barrels of crude oil.
b) The energy cost of upgrading the "common section" of I-94 and I-35, 8.3 thousands of barrels of oil, is not included.

TABLE 27
ENERGY IMPACT OF HOV LANES ON ALTERNATES A AND B[(a)]

IMPACT	ALTERNATE A YR 2000	ALTERNATE A LIFE	ALTERNATE B YR 2000	ALTERNATE B LIFE
Direct Energy Savings	29.4	882.0	25.1	753.0
Indirect Energy Savings	3.3	99.0	3.6	108.0
Total Energy Savings	32.7	981.0	28.7	861.0

[(a)]Energy measured in equivalent barrels of crude oil (in thousands).

Comparison of net energy savings (Table 27) and total energy without HOV lanes (Tables 25 and 26) indicates that HOV lanes cause a reduction of slightly less than one-half of one percent. This decrease in energy use is not significant.

Energy Impact of Light Rail Transit

The Metropolitan Council has concluded that the south-southwest corridor in St. Paul is not a viable LRT corridor. This conclusion was based on three evaluation criteria: (1) market by travelshed, (2) market by subregion and (3) congestion forecasted in the corridor on the metro highway system.

Given that LRT does not appear feasible in the corridors under consideration, and given the lack of significant decrease in energy use with HOV lanes, it appears that further analysis is not warranted at this point.

Impacts of Transportation System Management Measures

Transportation System Management (TSM) actions involve a wide range of transportation improvements in the areas of traffic engineering, transit improvements, parking strategies, and pricing schemes, for the purpose of improving air quality, conserving energy, and increasing the efficiency of the overall transportation system.

Given the magnitude of total energy consumption, and the lack of significant differences among the alternatives examined, it is not likely that TSM measures would have any significant energy reduction impact. (A significant impact would require a reduction in energy consumption of more than half-a-million barrels of oil per year.)

Unavoidable Adverse Impacts

The direct energy impacts estimated above are unavoidable given present technology and anticipated travel behavior. Provision of HOV lanes and implementation of TSM measures are not likely to significantly decrease energy use.

Irretrievable Commitment of Resources

The energy expenditure for construction, operation and maintenance of any alternative is irretrievable.

AESTHETICS

Views of the Road

The "view of the road," as the phrase implies, is any vista which is partially or wholly comprised of the roadway corridor. Views of the road vary in dimension and clarity in accordance with distance and screening. The vantage point, or position of view, can also vary widely.

Pleasant Avenue Corridor

Based on the views of the Pleasant Avenue corridor described in Figure 24, several points may be inferred:

1. The relation of the roadway elevation to the surrounding ground plane and landscape is strategic. In general, an elevated or at-grade roadway will be more visible than one which is depressed.

2. Existing features have a direct effect on views. The existing bluff and vegetation may screen or block views, whereas a perpendicular street orients the view towards the corridor.

3. Cross-section design is the most influential aesthetic factor. Due to the design characteristics, a typical freeway design will be more visible than a landscaped parkway-type design with its visual buffer.

Shepard Road Corridor

Visual intrusion with respect to views of the Shepard Road corridor would result from major Shepard Road/Warner Road modifications (see Figure 25). These modifications include proposed interchanges, deviation from existing alignment and encroachment upon the river. The Lexington Bridge extension, Otto and Randolph interchanges, and the realignment near the NSP Highbridge Plant are examples. The most extensive intrusion would clearly occur to the Irvine Park Historic District. These specific examples either consume existing open space or intensify use. Encroachment upon the river east of Chestnut below the CBD bluffline would be visually intrusive to river users.

Views from the Road

Views from the road are those views which the driver or passenger sees while traveling within a roadway corridor. Vantage points (position of view) vary greatly according to the height of the vehicle, the traveling speed and the elevation of the roadway. Vistas are equally variable. Views may be short or long, and directed to elements within or outside the roadway corridor. View angles and widths are determined by vantage and by sight screens or barriers.

Pleasant Avenue Corridor

The factor which poses the greatest implications for Pleasant Avenue's views from the road is the type of roadway constructed. A four-lane freeway design section may allow open views due to its form. However, when high driving speeds, a variable center barrier/median (3-6 feet in height) and potential noise walls are considered, views diminish in dimension and clarity. A median parkway design has other potential effects. The parkway's landscaped right-of-way and median would screen views from the road as a soft buffer. The lower design speed would reinforce the landscape's visual qualities. Views within the corridor may be more dominant than those outside the corridor.

Shepard Road Corridor

The most critical factor influencing views from the road in the Shepard Road corridor is the design of the roadway in relation to the river. Views are contingent upon their height in relation to the surroundings, the type of median barrier used and the visibility allowed by the river side guardrail. Also, most of the southbound lane is squeezed against the bluff which obstructs potential views of the river. In general, realignment of Shepard Road toward the river or terracing the lanes allows more views from the roadway, while the location of the roadway away from the river constrains views from the road.

Mitigation

The purpose of visual impact mitigation is to lessen or moderate the intrusion resulting from the proposed roadway. Throughout both corridors, Pleasant Avenue and Shepard Road, significant benefit can be realized through the implementation of mitigation measures.

Pleasant Avenue

Freeway landscaping would help soften the appearance of the roadway and may also improve views from the roadway. It is recommended as a minimal mitigating measure to help reduce the anticipated negative aesthetic impacts.

The parkway alternatives (planted median-types) offer significant aesthetic improvements over the freeway alternatives. Reducing traffic and eliminating heavy trucks will reduce both the sight and sound generated by the roadway. Therefore, wherever a parkway is proposed to replace the freeway, the negative visual impacts (views "of the road" and "from the road") will be substantially reduced within the corridor. However, this truck traffic will be redirected to other streets. Planted medians, narrower roadway width and increased right-of-way landscaping associated with the parkways will help buffer the aesthetic impact of the traffic.

Detailed mitigation of visual intrusion of the Pleasant Avenue alternatives is mostly directed toward the adjacent residential neighborhoods, with the most severe impacts occurring with Alternative A, the

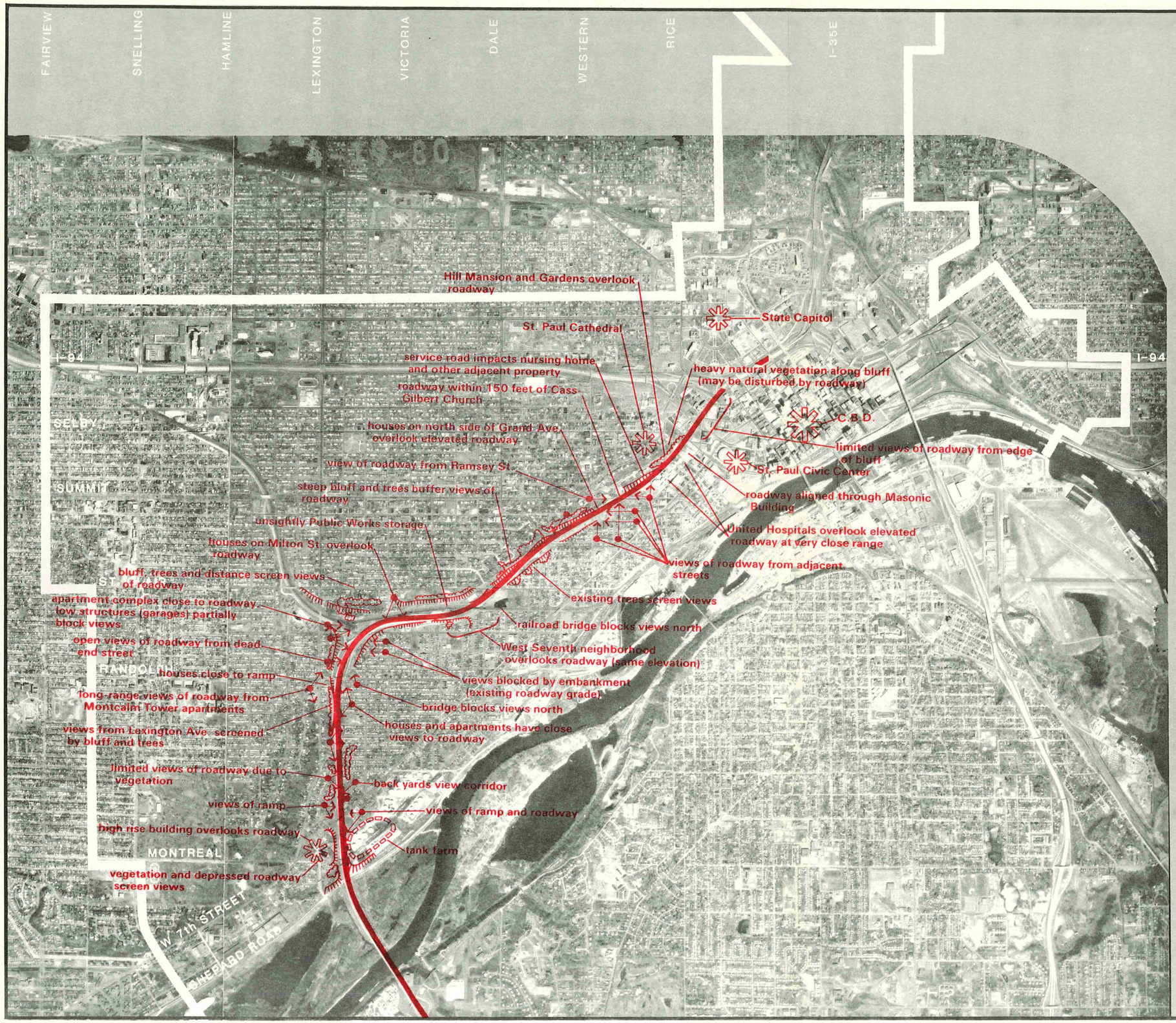


FIGURE 24

VIEWS OF THE ROAD

PLEASANT AVENUE CORRIDOR

VIEW
VANTAGE POINT

LANDMARK

VISUALLY DISRUPTIVE LAND USE

VEGETATION MASS

SLOPE
CREST

0 2000 4000 8000 Feet

N

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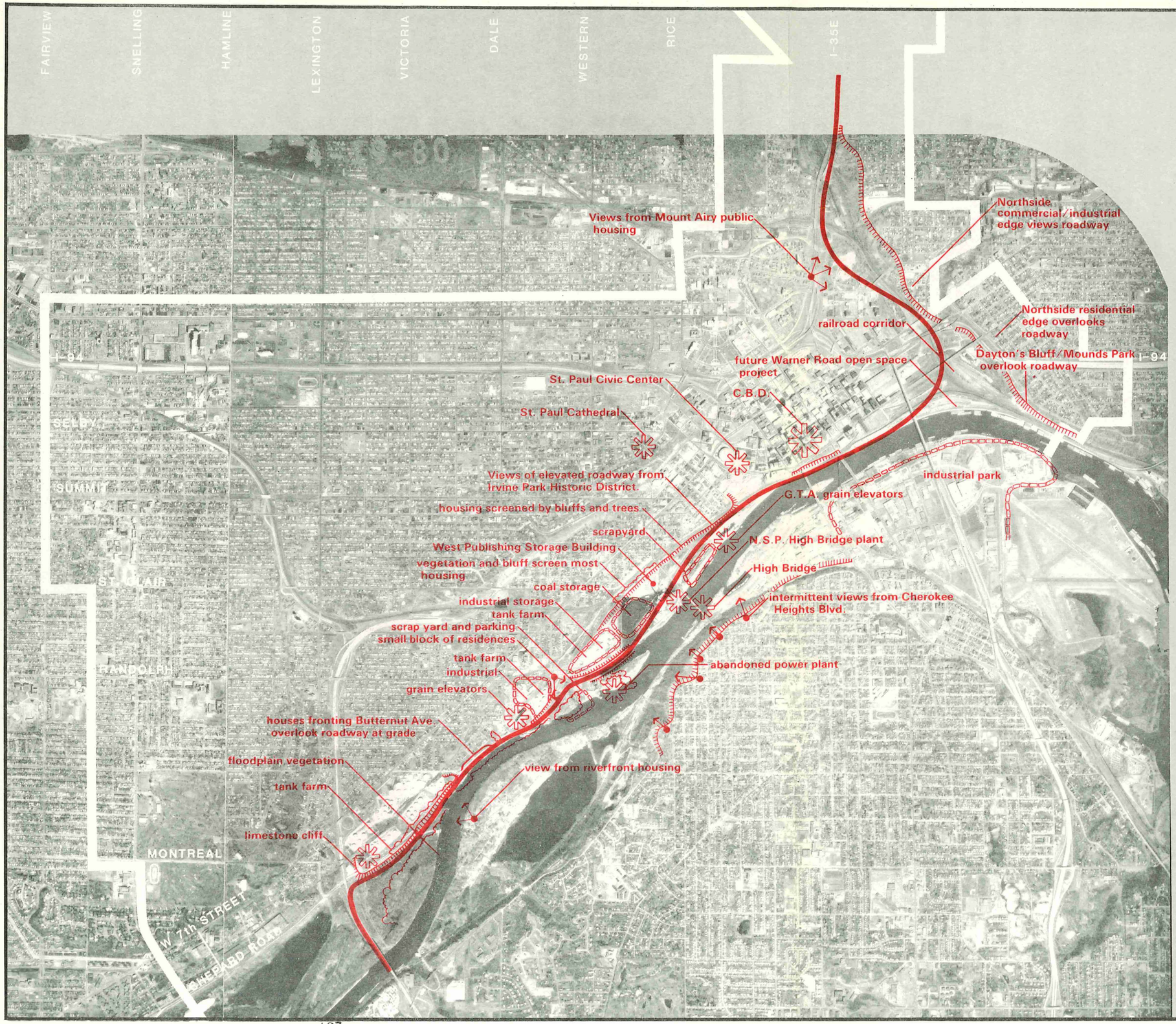


FIGURE 25

VIEWS OF THE ROAD

SHEPARD ROAD CORRIDOR

VIEW
VANTAGE POINT

LANDMARK

VISUALLY DISRUPTIVE LAND USE

VEGETATION MASS

SLOPE
CREST

0 2000 4000 8000 Feet

I35E

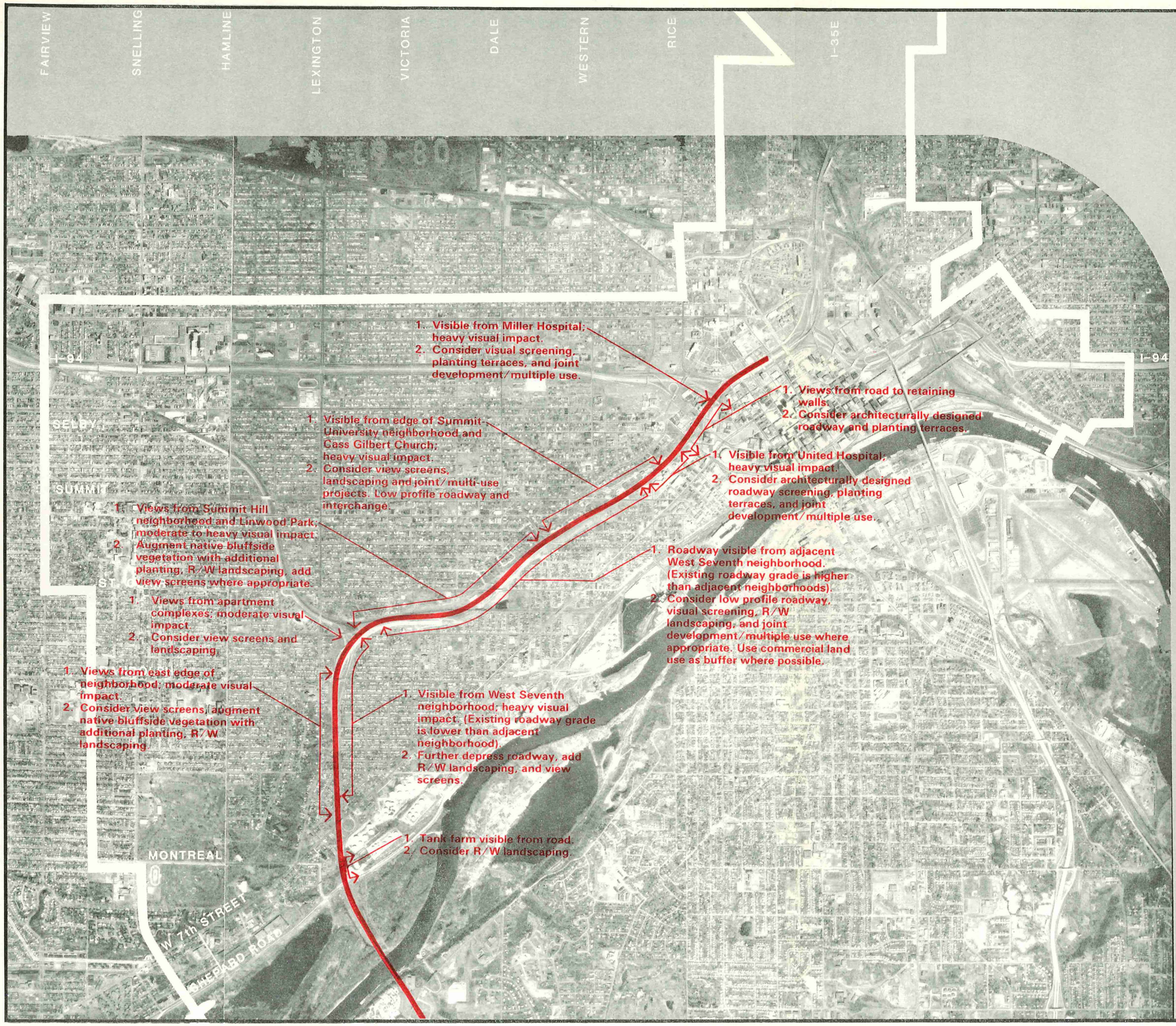


FIGURE 26

MITIGATION

PLEASANT AVENUE CORRIDOR

MITIGATION PROCEDURE

STEP 1. ASSESSMENT OF VISUAL INTRUSION

STEP 2. RECOMMENDATION OF APPROPRIATE MITIGATION MEASURES

0 2000 4000 8000 Feet

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FAIRVIEW
SNELLING
HAMLINE
LEXINGTON
VICTORIA
DALE
WESTERN
RICE
I-35E
I-94
SELBY
SUMMIT
ST. CLAIR
RANDOLPH
MONTREAL
W. 7TH STREET
SHEPARD ROAD

1. Visible from Mount Airy Homes; minimal impact.
2. Consider R/W landscaping.

1. Unattractive views from road to industrial areas.
2. Consider R/W landscaping and site screening.

1. Visible from C.B.D.; moderate visual impact. Unattractive view from the road to the north.
2. Clean up and landscape where possible.

1. View of elevated roadway from Irvine Park Historic District; heavy visual impact.
2. Consider visual barrier to block view up to elevated structure, compliment with landscaping.

1. Undesirable views to industrial areas (coal storage, tank farm, other outdoor storage).
2. Consider screening, open space development.

1. Visible from residences; moderate visual impact.
2. Consider lower interchange grade, and R/W landscaping.

1. Visible from Butternut Ave. Residences; moderate visual impact.
2. Consider visual screens and landscaping.

1. Visible from Crosby Farm Open Space Project; heavy to minimal visual impact.
2. Consider joint park/roadway development and aesthetically designed roadway structures.

1. Visible from adjacent residences; minimal impact.
2. Consider R/W landscaping.

1. Visible from Mounds Park and Mounds Blvd. residences; moderate impact.
2. Consider landscaping and maximizing open space.

1. Visible from future Warner Rd. open space project; heavy visual impact.
2. Consider aesthetically pleasing design of roadway structures.

1. Visible from river, Harriet Isl., Navy Isl., and so. river bank; minimal visual impact.
2. Roadway should maintain low profile.

1. Unattractive views from road to industrial areas.
2. Consider landscaping and screening.

1. Visible from commercial/industrial development; moderate visual impact.
2. Consider commercial multi-use.

1. Visible from edge of Cherokee Heights neighborhood and parkway.
2. Consider wide green-belt, R/W, and encourage low profile roadway.

1. Occasionally visible from river.
2. Roadway should not encroach further into river. Consider joint roadway/open space development.

1. Views from road to unsightly junkyard and abandoned bldgs.
2. Consider R/W landscaping, screening, and open space development.

1. Views from river and opposite riverbank; minimal visual impact.
2. Show no further encroachment of river corridor; consider additional landscaping.

FIGURE 27

MITIGATION

SHEPARD ROAD CORRIDOR

MITIGATION PROCEDURE

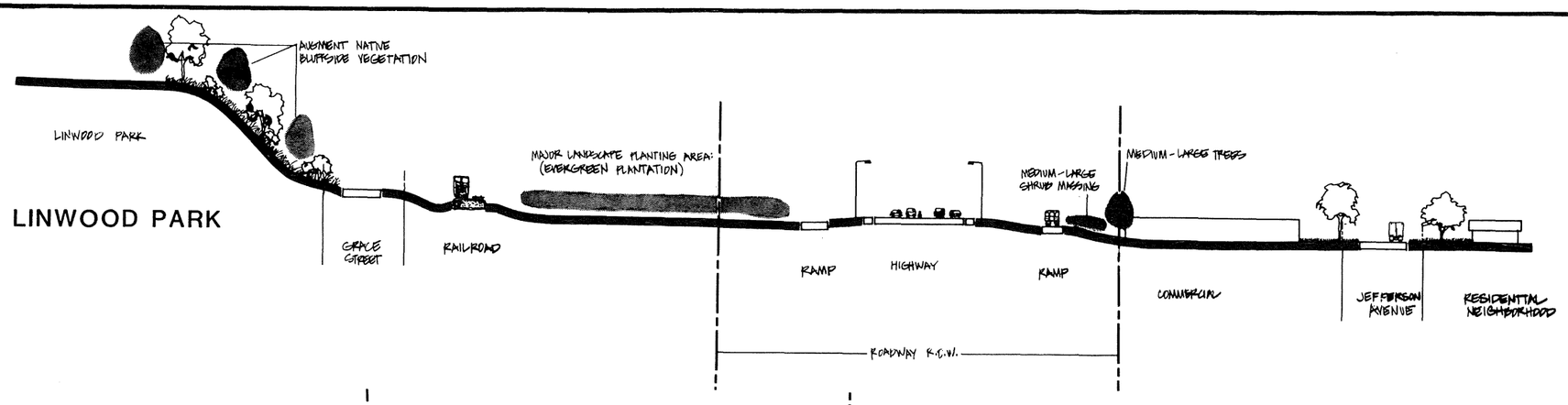
STEP 1. ASSESSMENT OF VISUAL INTRUSION

STEP 2. RECOMMENDATION OF APPROPRIATE MITIGATION MEASURES

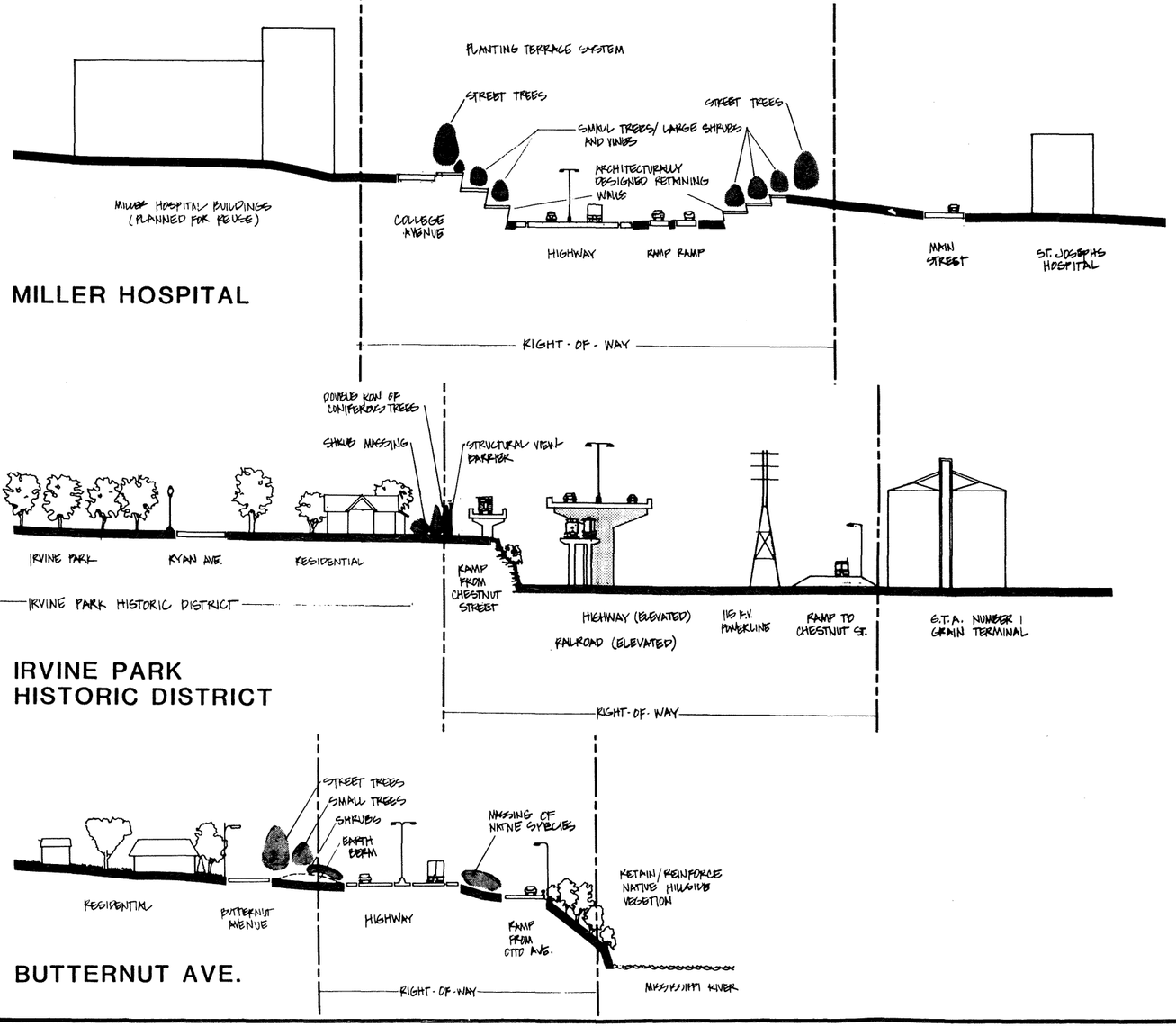
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LINWOOD PARK



MILLER HOSPITAL

IRVINE PARK HISTORIC DISTRICT

BUTTERNUT AVE.

FIGURE 28

SELECTED LANDSCAPE MITIGATION CONCEPTS

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six-lane freeway. (Approaches to mitigation are presented in Figure 26.)

Shepard Road

From the existing Interstate 35E Mississippi crossing to Otto Avenue, the heaviest visual impact will be on the Crosby Farm Open Space. The roadway would cross the open space on an elevated causeway structure, causing heavy visual impact. Joint development/multiple use could utilize the land below the causeway or within some other portion of the open space for the benefit of the users.

Between Otto Avenue and Randolph Avenue the potential visual impact is less, since the proposed roadway will be similar in character with existing Shepard Road. The minimal to moderate impact that would occur could be lessened by landscaping, screening, minimizing roadway height and maximizing open space.

Between Randolph Avenue and the southwest corner of downtown St. Paul, a portion of the alignment deviates from Shepard Road, where it is proposed to run between the hillside and the grain elevator/power plant area. Minimal to moderate visual impact would result from vantages on both sides of the river. Landscaping, screening and open space acquisition should be considered throughout this portion. View barriers and landscaping should be used to lessen the extensive impact to the Irvine Park neighborhood. The same measures should be considered to minimize negative views of industrial/commercial areas from the road. Figure 27 illustrates Shepard Road mitigation potential.

Selected Landscape Mitigation Concepts

The Pleasant Avenue corridor, near Linwood Park, would be graded to a slightly depressed section (see Figure 28). Landscaping would help screen views of the road from the residential neighborhood. The inherent screening capability of the depressed section could be augmented by an earthen berm with landscaping. Massings of small native trees on the berm would serve as a transition to large trees planted in rows along right-of-way line or frontage road. The hillside vegetation should be supplemented by additional native plantings enhancing the natural buffer.

Right-of-way and slope constraints occur in the United Hospital area with the Pleasant Avenue corridor (see Figure 28). Planting terraces with architecturally treated walls would allow the grades to be stepped back thereby reducing the confined corridor feeling. Vines, shrubs and trees could be used to soften the retaining structures.

Shepard Road, in the vicinity of the Butternut Avenue neighborhood, would be aligned near the edge of the bluff between the residential neighborhood and the river (see Figure 28). Sufficient space exists between the corridor alignment and Butternut Avenue to construct earth berms (the height of the berm influenced by the width of the space). The addition of shrubs, small trees and street trees will serve to screen unattractive views of the road.

Near the Irvine Park Historic District the Shepard Road corridor would be aligned between the bluffline and the GTA grain terminals (Figure 28). Due to the significant visual intrusion of the roadway, an opaque, structural view barrier should be considered. The barrier should be sited to block views of the southbound entrance ramp and main line. Shrub massing and a double row of coniferous trees would complement the barrier and reinforce the buffer.

Unavoidable Adverse Impacts

Many of the negative aesthetic impacts can be avoided or mitigated to some degree. However, it is expected that unavoidable adverse impacts will remain in the area of: Crosby Park for both corridors; Irvine Park and the river gourge for Alternative B (Shepard Road freeway); as well as the United Hospital area, the Ramsey Hill area and various portions of the West Seventh neighborhood for Pleasant Avenue alternatives.

TABLE 28
HISTORIC PROPERTIES

ALTERNATE	I	A	A[1]	C	D	E	F	G	H	B	J	K
LOCATION	NO BUILD	PLEASANT								SHEPARD	PLEASANT/SHEPARD	
FACILITY		FREEWAY		PARKWAY						FREEWAY	PARKWAY	
CONNECTION		DIRECT		DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	DIRECT	INDIRECT	
PARKWAY				W7TH - CBD		SHORT LINE - CBD		I-494 - CBD			W7TH-CBD	SHORT LINE - CBD
Section 4(f) Properties	None	German Presbyterian Church	Same as A	Same as A	Same as A	Same as A	Same as A	Same as A	Same as A	1) Union Depot 2) Robert Street Bridge 3) Chapel of St. Paul 4) Irvine Park: A) Wright-Prendergast Residence B) Horn House 5) Butternut Avenue 6) Lift Bridge 7) N.P. Freight House	Same as A	Same as A
Section 106 Properties												
Direct Impacts	None	1) German Presbyterian Church 2) Selby Ave. Tunnel 3) James Hill Mansion	Same as A	1) German Presbyterian Church 2) James Hill Mansion	Same as C	Same as C	Same as C	Same as C	Same as C	Same as Section 4(f) Properties for Alternate B	Same as C	Same as C
Indirect Impacts	None	1) Historic Hill District 2) Quinlan Care Home 3) How Residence	Same as A	Same as A	Same as A	Same as A	Same as A	Same as A	Same as A	1) Irvine Park 2) Panama Flats 3) Myrick House 4) Wabasha Bridge 5) Smith Bridge 6) MN Boat Club 7) GTA Terminal	Same as A	Same as A
Sites of Local Interest	None	1) St. Paul Masonic Temple	Same as A	Same as A	Same as A	Same as A	Same as A	Same as A	Same as A	1) Emmert House 2) 276 Chestnut 3) Phalen's Cabin 4) Upper Landing 5) Lower Landing 6) Chestnut Ave. Ind. Dist.	Same as A	Same as A

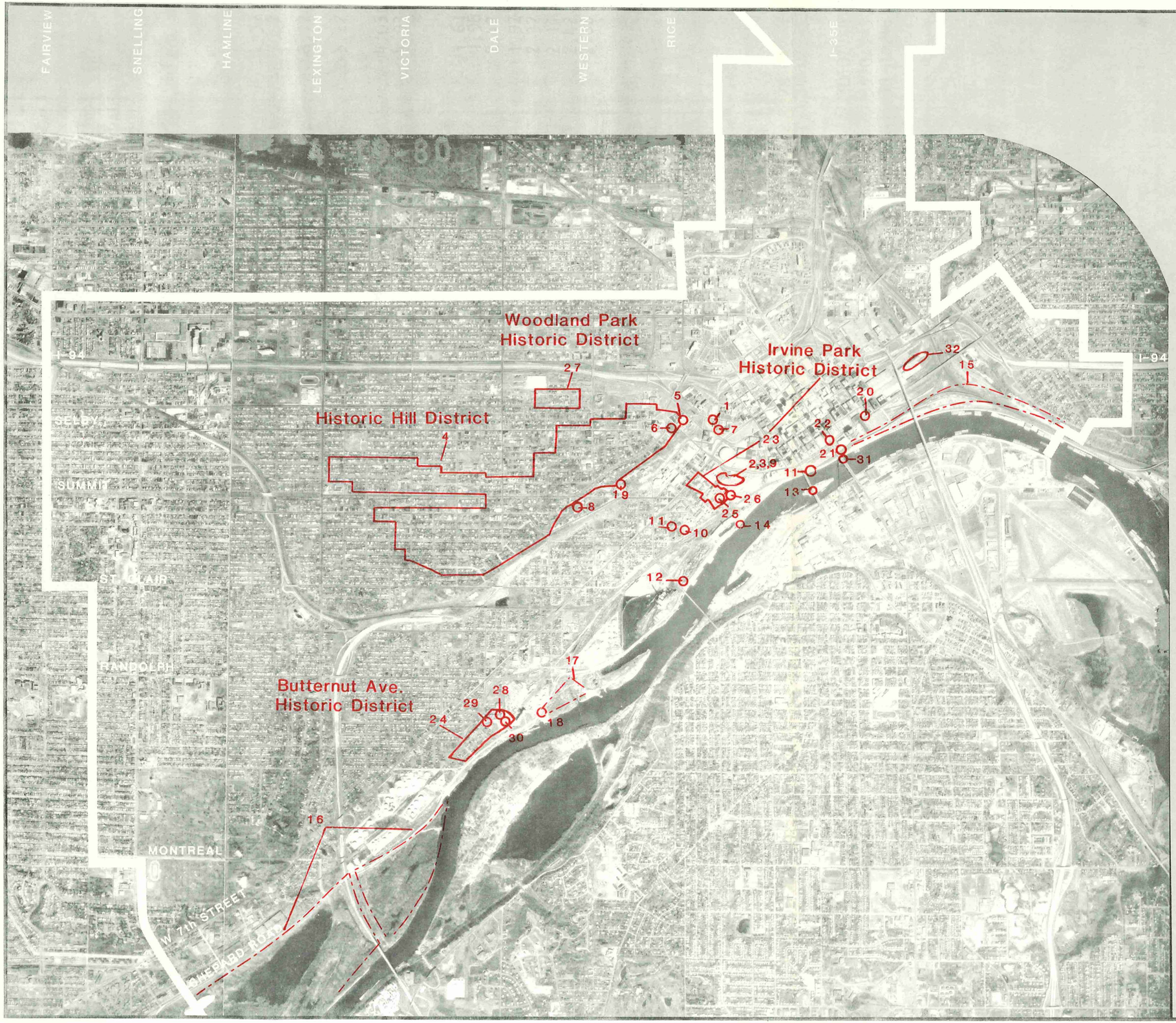


FIGURE 29
REGULATED LANDS– HISTORIC AND RECREATIONAL PROPERTIES

1. ST. PAUL MASONIC TEMPLE
2. FREDRICK EMMERT HOUSE
3. RESIDENCE , 276 CHESTNUT
4. HISTORIC HILL DISTRICT
5. SELBY AVENUE TUNNEL
6. JAMES J. HILL MANSION
7. QUINLAN CARE HOME
8. HOW RESIDENCE
9. PANAMA FLATS
10. NATHAN MYRICK RESIDENCE
11. WABASHA STREET BRIDGE
12. SMITH AVENUE HIGH BRIDGE
13. MINNESOTA BOAT CLUB BOATHOUSE
14. GTA NO. 1 TERMINAL
15. WARNER ROAD OVERLOOK
16. CROSBY FARM REGIONAL PARK
17. CROSBY FARM PARK ADDITION
18. FOUNTAIN CAVE HISTORIC MARKER SITE
19. GERMAN PRESBYTERIAN CHURCH
20. ST. PAUL UNION DEPOT
21. ROBERT STREET BRIDGE
22. CHAPEL OF ST. PAUL
23. IRVINE PARK HISTORIC DISTRICT
24. BUTTERNUT AVENUE HISTORIC DISTRICT
25. WRIGHT PRENDERGAST HOUSE
26. HENRY HORN HOUSE
27. WOODLAND PARK HISTORIC DISTRICT
28. FREDRICK BANHOLZER ESTATE
29. RESIDENCE 681 STEWART
30. NORTH MISSISSIPPI BREWERY SITE
31. CHICAGO GREAT WESTERN LIFT BRIDGE
32. NORTHERN PACIFIC FREIGHT HOUSE

0 2000 4000 8000 Feet

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SITES OF LOCAL HISTORIC INTEREST*

An inventory of historic sites within the Primary Impact Area has been conducted. Properties having potential historic significance which could potentially be impacted by construction of I-35E were identified. Figure 29 illustrates the location of these sites in relationship to I-35E alternate project corridors. Such properties will be addressed in three sections of this document. Historic sites eligible for Section 106 review and historic properties protected by Section 4(f) of the DOT Act of 1966 will be analyzed respectively in Sections V and VI to follow. This section will address properties not eligible for special review, but which are of local historic interest.

Materials contained within this document were developed in coordination with the Minnesota Historic Preservation office, MnDOT, FHWA, and the City of St. Paul. Correspondence from SHPO, listing sites of concern with regard to the proposed I-35E project development was incorporated within this analysis. The SHPO has concurred with the determinations documented herein.

St. Paul Masonic Temple
130 North Smith Street

Description

The St. Paul Masonic Temple was built in 1908 for the Masonic Temple Association as a meeting place and headquarters for the order. (The location of the Masonic Temple is shown on Figure 29.) The building was designed by the St. Paul architectural firm, Buchner & Orth, in the Second Renaissance Revival style. Portions of the building were heavily damaged by fire in May 1981.

This structure does not exhibit sufficient outstanding architectural or historical significance as to be eligible for inclusion on the National Register. A better example of this architectural style is the St. Paul/Hill Reference Library located at Fourth and Market. The library is listed on the National Register and meets all of the design characteristics typical of the style.

The temple property was acquired by the City of St. Paul in 1972 in order to complete the Fifth and Sixth Street connection to Interstate Highway 94. In 1978, an extensive evaluation of the Masonic Temple conducted by the City Architect and the Department of Planning and Economic Development concluded that reuse of the building would be economically infeasible and would duplicate other facilities currently located in the downtown.

*Information on historic impacts is derived from the "Historic Sites Assessment" and "Archeological Survey" - Appendices Q and E respectively.

Unavoidable Adverse Effects

The Masonic Temple would experience impacts under any of the Pleasant Avenue roadway alternatives. Right-of-way for the Fifth and Sixth Street connectors would take a portion of the Masonic Temple property requiring removal of the building.

Mitigation

Under any of the Pleasant Avenue corridor alternatives, a thorough HAB survey of the Masonic Temple should be considered before demolition of the building occurs.

If Alternate B is chosen as the preferred alternative, design options for moving the location of the interchange eastward could be considered.

Fredrick Emmert House
272 Chestnut Street
Residence, 276 Chestnut

Description

These two 2½-story residences are constructed of wood, clapboard in a simple rectilinear design. (See Figure 29 for the location of these sites.) The Emmert house was approximately built in 1901 and the residence at 276 Chestnut in 1903. Both houses show excellent integrity of their original appearance. However, because neither show significant architectural or historical importance, they are considered not likely eligible for inclusion on the National Register. These properties are currently being studied by the St. Paul Heritage Preservation Commission for inclusion in a local historic district.

Unavoidable Adverse Effects

Under the Shepard Road freeway, Alternate B, removal of the Fredrick Emmert house would be necessitated for construction of the proposed Chestnut-Eagle interchange. The interchange would encroach upon the property at 276 Chestnut and could potentially require removal of this building also.

Mitigation

If Alternate B is chosen as the preferred alternative, design options for moving the location of the interchange eastward could be considered.

Archeological Sites

Several locations along the Mississippi River in the proposed right-of-way are related to the early exploration and settlement of St. Paul. These sites include the Fountain Cave, Chapel of St. Paul, Lower Landing, Upper Landing, Phalen's Cabin, and the Chestnut Street

Industries District. Over the years, construction of bridges, railyards, levees and the existing Shepard Road have eliminated evidence of the historic and archeological features of most of these sites, and therefore they are not likely eligible for inclusion on the National Register. With the exception of the Chestnut Street Industries District, all of these sites are marked by historic plaques, which except for the Fountain Cave Marker are located in Kellogg Park.

If Alternate B is selected as the preferred alternative, a construction monitoring program should be undertaken at the location of the chapel site. Should historic or archeological features be disclosed by terrain modifications during construction, appropriate procedures for recovering data should be implemented. (Because the former two sites are located on publicly-owned land, they will be discussed in further detail in the 4(f) analysis found in Section VI of this document.)

Irreversible Commitment of Resources

Under project Alternates A, A', C-H, J and K, removal of the St. Paul Masonic Temple would constitute an irreversible commitment of resources. Under Alternate B, the removal of th Fredrick Emmert house and the potential taking of the residence at 276 Chestnut Street would constitute an irreversible commitment of local resources.

V. SITES ELIGIBLE FOR SECTION 106 REVIEW

INTRODUCTION

Section 106 of the National Historic Preservation Act of 1966, as amended, and Executive Order 11593 "Protection and Enhancement of the Cultural Environment" requires that impacts of federally-assisted projects be examined for all historic districts, sites, buildings, structures, or objects, and archaeological sites listed or eligible for inclusion in the National Register of Historic Places. The Act also requires that federal agencies afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on undertakings that effect such properties. The ACHP has established procedures for the "Protection of Historic and Cultural Properties" (36 CFR, part 800). This section includes information necessary for compliance with the Section 106 process and the procedures of the ACHP with regard to the potential impacts of the I-35E project alternatives on historic properties. This section contains a "determination of effect" required by the ACHP. All sites which are potentially eligible for 106 review as described above will be analyzed below, with the exception of those properties which are protected by both Section 106 and Section 4(f) of the DOT Act of 1966. To avoid duplication in the EIS, such properties will be addressed under the 4(f) analysis in Section VI of this document. In any case 106 and 4(f) procedures will be fully followed.

IDENTIFICATION OF HISTORIC SITES

An inventory of the I-35E Primary Impact Area was conducted to identify all properties having potential historic significance which could potentially be affected by any of the I-35E roadway alternatives. The following sites were identified:

1. Historic Hill District

   a. Selby Avenue Tunnel
      Selby Avenue and Kellogg Boulevard

   b. James J. Hill Mansion
      (Garden Walls)
      240 Summit Avenue

2. Quinlan Care Home
   223 West Fifth Street

3. How Residence
   455 Grand Avenue

4. Panama Flats
   226-234 Exchange

5. Nathan Myrick Residence
   103-105 Wilken Street

6. Wabasha Street Bridge
   Wabasha Street over the Mississippi River

7. Smith Avenue High Bridge
   Smith Avenue - one-half mile south of the St. Paul Central Business District

8. Minnesota Boat Club Boathouse
   Wabasha Street on Navy Island

9. GTA No. 1 Grain Terminal

Figure 29 illustrates the location of these sites in relationship to I-35E alternate project corridors.

PRELIMINARY DETERMINATION OF EFFECT

At this drafting of the Environmental Impact Statement, neither a formal determination of eligibility nor application of the "Criteria of Effect" and "Criteria of Adverse Effect" (36 CRF 800.3) has yet been completed. The following documentation of eligibility and impacts has been compiled in consultation with the SHPO and FHWA. Coordination with the Regional FHWA office, the Department of the Interior and the ACHP will be documented in the Final EIS. It should be noted that the mitigation measures suggested herein are tentative. Adoption of mitigation measures will be accomplished through the 106 process as decided by the ACHP, SHPO, and FHWA.

Historic Hill District: Selby Avenue Tunnel, James Hill Mansion

Description

The Historic Hill District comprising approximately 75 blocks, is designated on the National Register of Historic Places. Historically, development of the district progressed westward from the northeast portion to the southwest. The present land use is predominantly residential with the exception of the Grand Avenue commercial spine.

The Selby Avenue Tunnel is located within the boundaries of the Historic Hill District. It was built in 1906 for transportation use as part of the early Minneapolis/St. Paul street car system. The tunnel is 1500 feet in length and rises from the base of the Hill District heading west at a 7% grade under Selby Avenue. The approach walls of the east portal are 23 feet apart and vary in height, with a maximum of 15 feet. The walls are constructed of reinforced concrete with wrought ironwork along the top. The tunnel is no longer in use, although some machinery may still be in place. Except for a portion of the property transferred to MnDOT by a commissioner's order, the tunnel property remains a transportation easement for the City of St. Paul. The property held by MnDOT was transferred prior to its designation of historic significance.

The James J. Hill mansion was designed by Peabody and Sterns of Boston in Richardsonian Romanesque style. It was built between 1888

and 1891 and is the largest residential structure built on Summit Avenue. The mansion once served as the residence of James J. Hill, a railroad developer in St. Paul. Today, it is a national historic landmark and portions of the building serve as offices for the Minnesota Historical Society (MHS). The James Hill house is currently owned by MHS. Back lot portions of the property were purchased by MnDOT in 1968 for right-of-way purposes prior to the district's designation on the National Register.

The portion of the original Hill estate that would be directly affected* by I-35E roadway construction includes the foundation and basement walls of the carriage house. Record drawings of this structure indicate that it housed a conservatory, a boiler, an engine room, and carriages. The structure also incorporated a large retaining wall that helped stabilize the slope on which the Hill estate is located. The walls, in existence today, are 32 feet in height from the top of the wall to the bottom of the footing, with a width of ten feet six inches at the base.

Potential Adverse Effects

Three locations within the Historic Hill District are directly impacted by Pleasant Avenue alternates. Properties that would be physically disturbed include the Selby Tunnel site, back lots of the Hill property, and the German Presbyterian Church. The latter property is discussed in Section VI of this document.

Roadway alignments indicate that under freeway alternates A and A' a southbound on-ramp and frontage road would use approximately 150 square feet of district property, requiring the removal of the first 75 feet of the Selby Avenue Tunnel approach walls (see Figure 30a). This encroachment would occur on MnDOT owned property and would not require any additional acquisition of land. Use of the tunnel property would most likely eliminate any chance for re-opening the tunnel for historic interpretation, as has been done on part of the Minneapolis line. The west portal, which is the main tunnel entrance, would not be affected by any of the alternatives, and access to the tunnel site could still be attained by a connection through the Historic Hill District from the west.

Construction of any of the Pleasant Avenue alternatives would use property at the base of the James Hill mansion requiring the removal of the previously described foundation walls and portions of a former garden (see Figure 30b). Under the worst case, freeway Alternate A, a parcel of land 200 x 60 feet, would be involved. The land used would be contained within the right-of-way limits previously acquired by MnDOT. No additional encroachment upon the James Hill estate would be required.

*In the context of historical evaluation, direct historical impacts are limited to those properties which will be partially or totally taken for right-of-way or for construction easement. Indirect historical impacts include such things as visual intrusion, air quality degradation, vibration, and noise.

Under any of the Pleasant Avenue alternates, the Historic Hill District would be indirectly impacted by noise, aesthetics and freeway lighting. Approximately 75 homes built along the bluff line on the southern boundary of the district would be affected. The aesthetic impacts of the parkway alternates would be less than the Pleasant Avenue freeway alternates. Noise impacts would be lower under parkway alternates D, F and H than any other Pleasant Avenue alternate.

Alternatives That Would Avoid Adverse Effects

All impacts to the Historic Hill District and associated historic sites could be avoided if Alternate B or the No-Build Alternate were chosen as the preferred alternative. In the case of the Selby Avenue Tunnel, selection of any alternative other than A or A' would avoid direct physical impacts to the property.

Measures to Minimize Harm

Mitigation measures for properties within the Historic Hill District involve the following.

At the Selby Avenue Tunnel site, a thorough HAER survey of the affected property, including photographs and record drawings, could be conducted prior to construction of I-35E.

Mitigation at the James J. Hill Estate could include:

1. A thorough HAER survey of the remaining structure, prior to dismantling.

2. Excavation and recording of all surface and subsurface archeological features according to professional standards.

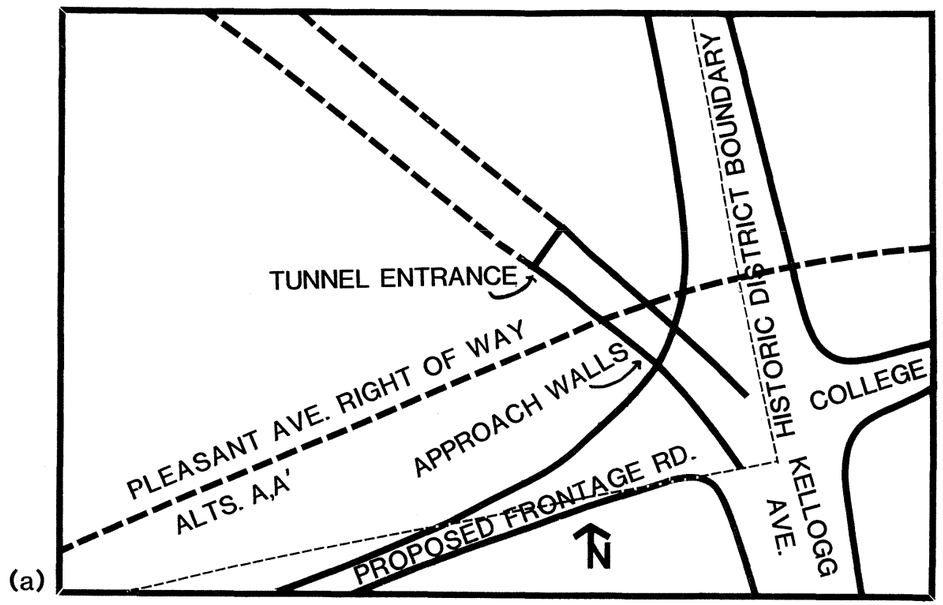
3. Reuse of the removed sandstone blocks that form the foundation/retaining wall as a facing material for any new retaining walls required to stabilize the slope.

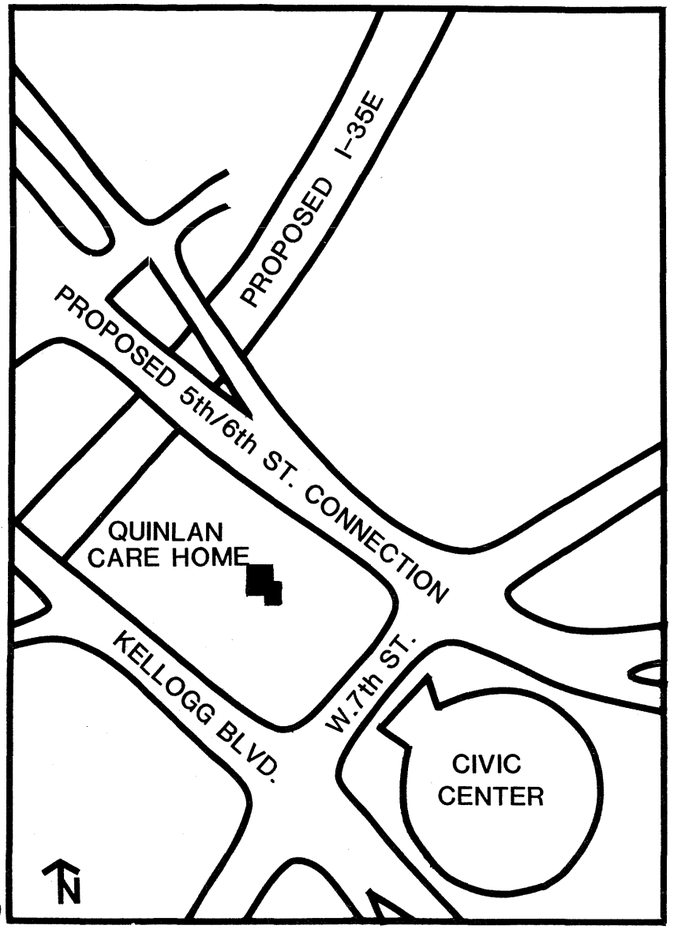
Quinlan Care Home

Description

The Quinlan Care Home is a two and one-half story, red brick, double-unit dwelling built by the George Washington Armstrong family in 1886. It was designed by architect E.P. Bassford, supervising architect of St. Paul U.S. government buildings. The home, built in the Victorian Era styles of Queen Anne and Richardsonian Romanesque, was recognized by highly decorative surface treatment, irregular plan and bold structural massing.

The Quinlan Care Home is potentially eligible for inclusion on the National Register, one of few architecturally and historically worthy residences located within the St. Paul central business district. It is presently in a good state of preservation.





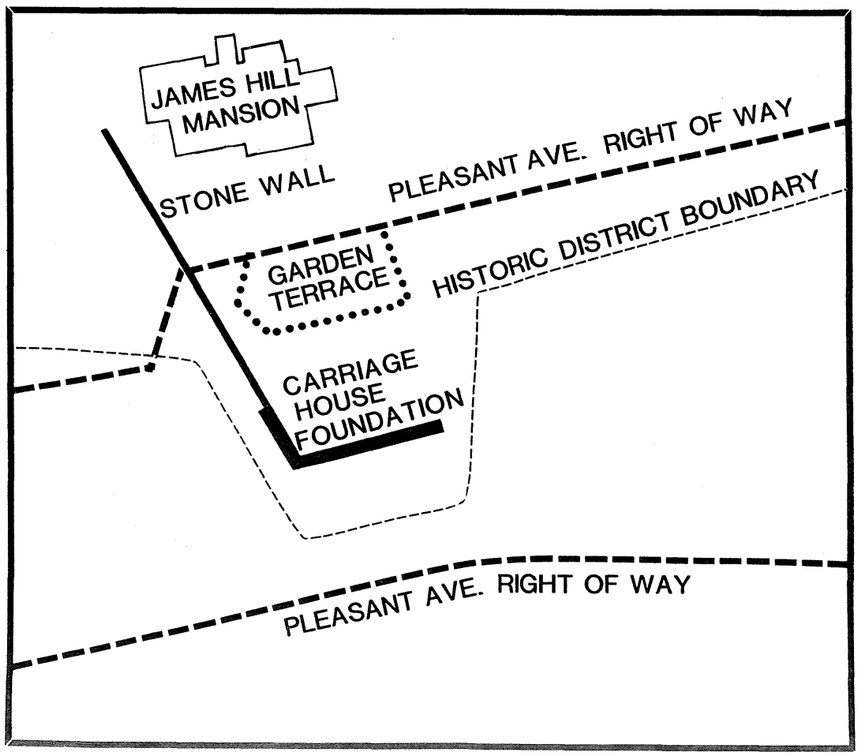


FIGURE 30

SECTION 106 PROPERTIES

(a) SELBY AVE. TUNNEL

(b) JAMES J. HILL PROPERTY

(c) QUINLAN CARE HOME

I35E

Potential Adverse Impacts

The Quinlan Care Home would experience noise and aesthetic impacts under any of the Pleasant Avenue alternates. In addition, the site would be encircled by either highway or major arterials serving as connectors to the highway under all Pleasant Avenue alternates (see Figure 30c).

Alternatives That Would Avoid Adverse Effects

Selection of I-35E project Alternates B or I would avoid impacts to the Quinlan Care Home.

Measures to Minimize Harm

Under any of the Pleasant Avenue parkway alternates, noise levels would be lower than under Alternates A or A'. If a freeway in the Pleasant Avenue corridor is chosen as the preferred alternative, the feasibility of constructing noise barriers to reduce noise during roadway operation would be explored.

How Residence

Description

The How residence, built in 1904, was designed by St. Paul architect Louis F. Lockwood for David How, a then prominent attorney. The design of the house is a mixture of classical and Tudor style. Its dominant features are brick and stone detailing, a rectangular plan and a large, two-story front porch. The house was renovated in 1970 and is in a good state of preservation.

Integral elements of the home's design are a detached two stall garage and surrounding fencework. The garage is reminiscent of the Prairie style and is perhaps the most successfully designed structure of the property. The extensive wrought iron and stone fencing surrounding the property is in excellent physical condition.

The How residence is potentially eligible for inclusion on the National Register and is located within the State Register boundary of the Historic Hill District.

Potential Adverse Effects

Impacts to the How residence would include noise, aesthetics, freeway lighting and traffic under any of the Pleasant Avenue alternates. Selection of one of the parkway alternates would have a lesser impact than would Alternates A or A'.

Alternatives That Would Avoid Adverse Effects

Selection of I-35E project Alternatives B or I as the preferred alternatives would avoid impacts to the How residence.

Measures to Minimize Harm

Under any of the Pleasant Avenue parkway alternates, noise levels would be lower than under Alternates A or A'. If a freeway in the Pleasant Avenue corridor is chosen as the preferred alternative, the feasibility of constructing noise barriers to reduce noise during roadway operation would be explored.

Panama Flats

Description

Panama Flats was built in 1886 by William Stoddard, from whom it received its historic name of the Stoddard Block. It is a three and one-half story, red brick rowhouse designed by Frank and George Orffin in the Queen Anne style. The building exhibits numerous bayed wall projections; horse shoe, high arch, and squared window openings; irregular roof line; patterned brick work, and a walk-out balcony. Renovation of the building has recently begun.

Panama Flats is eligible for inclusion on the National Register. A recent correspondence from the SHPO shows concurrence with this determination.

Potential Adverse Effects

Under the Shepard Road freeway alternative, Panama Flats would experience impacts of noise, aesthetics, and freeway lighting. Impacts would be generated by construction of the proposed Chestnut-Eagle interchange located next to the building. Increased traffic on Chestnut Street due to travelers using the interchange would cause impacts during operation of the roadway.

Alternatives That Would Avoid Adverse Effects

Selection of any of the I-35E project alternatives other than B would avoid impacts to this property.

Measures to Minimize Harm

If Alternate B is selected as the preferred alternative, the feasibility of constructing noise barriers to mitigate freeway noise should be explored.

Nathan Myrick Residence

Description

The Nathan Myrick residence was built in 1886 for Nathan Myrick, founder of LaCrosse, Wisconsin, and a St. Paul pioneer. The building is constructed of brick in Queen Anne style. It was recently renovated and is in an excellent state of preservation. A small home at 107 Wilken is attached to the south wall of the residence.

The Nathan Myrick residence is potentially eligible for inclusion on the National Register.

Potential Adverse Effects

Located on top of the bluff adjacent to Shepard Road, the Nathan Myrick residence would experience impacts of noise, aesthetic, and freeway lighting under Alternate B similar to those described for the Irvine Park Historic District. Impacts would be generated by an elevated roadway which passes in front of the house to merge with the I-35E mainline.

Alternatives That Would Avoid Adverse Effects

The selection of any I-35E project alternative other than B would avoid impacts to this property.

Measures to Minimize Harm

It appears that mitigation of impacts in this area would not be feasible due to the bluff lines. Construction of sound barriers would generate adverse visual effects.

Wabasha Street Bridge

Description

The Wabasha Street Bridge, Ramsey County number 6524, was constructed in 1889 and remodeled in 1955. The structure features a 1,200 foot long and 41.5 foot wide metal deck truss.

The bridge is one of the earlier surviving examples of its type carrying traffic over the Mississippi River into St. Paul. It is considered potentially eligible for inclusion on the National Register.

Potential Adverse Effects

The Wabasha Bridge could potentially be affected by project Alternate B. The I-35E roadway would pass under the bridge between bents which provide support for the structure. Proposed layouts and profiles indicate that location of the roadway would allow for adequate vertical clearance of the bridge. In addition, neither the roadway nor relocation of railroad tracks found in the project corridor would encroach upon the piers. However, construction of the roadway might prove hazardous to the integrity of the support bents.

Alternatives That Would Avoid Adverse Effects

Selection of any of the I35E project alternatives other than B would avoid impacts to this structure.

Measures to Minimize Harm

If Alternate B is selected, support bents in the construction area would be isolated by protective fencing in order to prevent any accidental collisions by construction equipment.

Smith Avenue High Bridge

Description

The Smith Avenue High Bridge was built in 1889 and is the longest 19th century bridge found in the area. Of five bridges that spanned the Mississippi River in St. Paul in 1902, the High Bridge is considered the highest attainment of engineering skill.

The main component of the structure is an iron, Warren Truss with subdivided panels, featuring an ornamental wrought iron railing across the top. The bridge spans 2270 feet and is supported by piers of iron and Mankato limestone. The bridge stands 190 feet above the river at the southern edge and 80 feet at the north. Coordination with MnDOT indicates that the life span of the structure is short-term. The bridge has suffered severe, irreversible deterioration due to use, weather conditions and age. Geometrical deficiencies limit use of the bridge to light weight vehicles, 6000 pounds and under. For these reasons, the bridge has been scheduled for replacement.

The High Bridge is eligible for inclusion on the National Register. The Minnesota Historical Society feels that this structure has become one of the most visual landmarks for the City of St. Paul.

Potential Adverse Effects

The High Bridge would be affected by I-35E project Alternate B. Roadway alignments indicate that the mainline of I-35E would pass beneath the bridge between bents that provide support for the truss. Construction of the roadway could prove hazardous to the integrity of the support bents.

Alternatives That Would Avoid Adverse Effects

Selection of any of the I-35E project alternatives other than B would avoid impacts to this structure.

Measures to Minimize Harm

If Alternate B is selected, support bents in the construction area would be isolated by protective fencing in order to prevent any accidental collisions by construction equipment.

The Minnesota Boat Club Boathouse

Description

The Minnesota Boat Club Boathouse was designed by H. G. Carsley and built in 1910 by the George Grant Construction Company. It preceded two earlier structures which had served as clubhouses.

The present building, of Spanish design, consists of two stories and a hip roof with 3-foot eaves. The structure measures 67 feet wide by 86 feet long and 23 feet to the eaves. The footings (2 feet by 7 feet), first and second floor bases (8-inch), and 28 16-inch diameter columns supporting the second floor are all of steel reinforced concrete.

The first and second floor walls are constructed of tile bricks (10-inch). Damage to portions of the east and south first floor walls during the 1965 flood necessitated replacement of this brick with concrete block (12-inch).

The ground floor of the building is presently used for storing Boat Club boats. A maintenance area for damaged equipment and a men's and women's locker room are also located on this floor. The upper level, which previously served as a meeting, dining and recreation center for club members, is currently being restored for use as office space by an architectural firm. The building shows good integrity. The Boat Club is significant because it is the oldest athletic organization in Minnesota, established in 1870.

Potential Adverse Effects

The Boat Club would potentially suffer adverse visual impacts to the north due to construction of the Shepard Road freeway alternative. The freeway would be constructed at a grade approximately 30 feet above the existing Shepard Road.

Alternatives That Would Avoid Adverse Effects

The selection of any of the project alternatives other than B would avoid impact to the Boat Club.

Measures to Minimize Harm

No feasible measures to mitigate visual impacts have been identified.

GTA Number 1 Grain Terminal

Description

The GTA grain terminal consists of essentially three historic components, a river loading mechanism, grain elevator and a bank of reinforced concrete, storage bins located directly above and adjacent to Shepard Road. These structures were constructed in 1916 by Equity Cooperative Exchange. The historical significance of this site lies in that it represents the first terminal to be built. It is considered

potentially eligible for inclusion on the National Register. Also located on the site is a larger bank of storage tanks which stand to the northwest of those discussed above. These were built at a later date and are not considered historically significant.

Potential Adverse Effects

The only potential impact to this property would be due to the relocation of Milwaukee Road and Chicago Northwestern mainline railroad trackage required under project Alternate B. The mainline track in the vicinity of the terminal would be relocated along Shepard Road passing beneath the grain elevator. No physical impact to the structure would be incurred. However, due to the presence of the railroad, truck loading procedures might be subject to change.

Alternatives That Would Avoid Adverse Effects

Selection of any of the project alternatives other than B would avoid potential impacts at this site.

VI. PRELIMINARY 4(f) DOCUMENT

INTRODUCTION

Section 4(f) of the Department of Transportation Act of 1966 declares a national policy that special effort be made to preserve the natural beauty of the countryside, public park and recreation lands, wildlife and waterfowl refuges, and historic sites. Section 4(f) permits the Secretary of Transportation to approve a project requiring the use of such publicly-owned lands of national, state, or local significance or privately-owned lands of national historic significance only where it can be shown that:

1. There is no feasible and prudent alternative to the use of such land; and

2. Such project includes all possible planning to minimize harm to the Section 4(f) land resulting from such use.

Purpose of Statement

This section contains the information and supporting documentation ultimately required by the Secretary of Transportation for his decision regarding the use of those properties protected by Section 4(f) for the proposed completion of Interstate Highway 35E in the City of St. Paul. (For documentation of the project's purpose and need, see Section I of the Draft EIS.)

There are twelve alternatives being considered in relation to the so-called "St. Paul I-35E Link," including: ten parkway/freeway variations in the Pleasant Avenue corridor, a freeway alternate along the existing Shepard Road alignment, and a no-build option. (Refer to Section II of the DEIS for a detailed description of the proposed alternatives.)

The purpose of this statement is to identify all potential 4(f) properties and analyze potential impacts caused thereto by the construction of any of the proposed I-35E alternatives.

PARK AND RECREATION LANDS

An inventory of park and recreation lands has identified two potential 4(f) properties in the Primary Impact Area.

1. Proposed Warner Road Overlook, located between the Mississippi River and Warner Road, from Sibley Street to Reserve Street.

2. Crosby Farm Regional Park and Proposed Crosby Farm Park Addition, located respectively: between the Mississippi River and existing Shepard Road, from Snelling to Bay Street; between the Mississippi River and existing Shepard Road at the Randolph/Shepard intersection.

Figure 29 illustrates the location of these sites in relationship to I-35E alternate project corridors.

Proposed Warner Road Overlook

The proposed Warner Road Overlook will be directly affected by Alternate B and the East CBD Bypass which is incorporated in Alternates J and K. The proposed overlook site will encompass 30 acres. Alternate B will require use of 100% of the site while Alternates J and K will take approximately 23 acres, 73% of the property. However, this site does not presently qualify for 4(f) designation for reasons cited below.

1. The property is currently in private ownership. It is in possession of the Milwaukee Railroad Company and is used for railroad piggyback operations. Acquisition of the proposed overlook has been authorized by the Federal Highway Administration (FHWA) as part of the Great River Road Project. However, no land has been acquired by the City of St. Paul as yet.

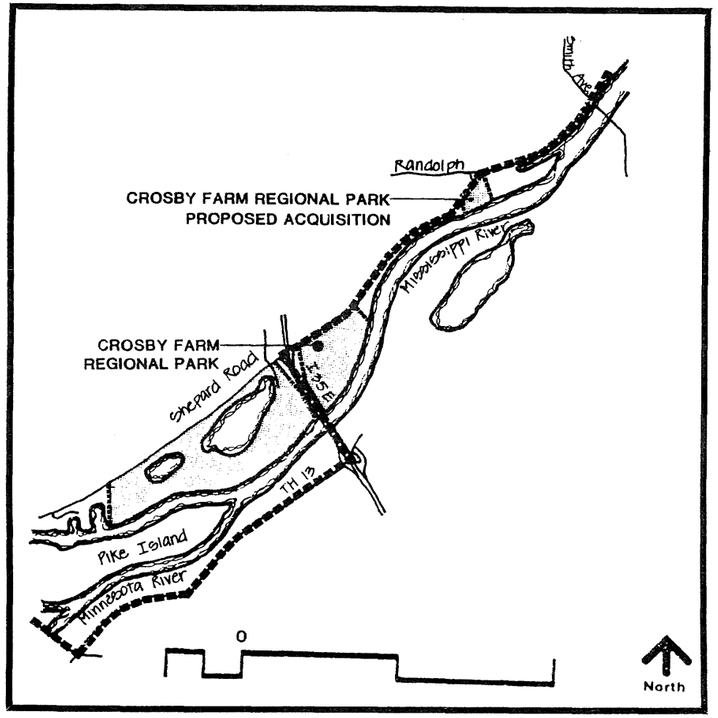
2. The property's proposed use is a roadway rest area and as such is considered a roadway amenity rather than a proposed park. According to the Minnesota Department of Transportation, Great River Road Route Selection and Development Guide, the site will include a safety rest area, parking and a detached bicycle and pedestrian path. A roadside area will provide access to Lambert's Landing, a site where early settlers arrived by steamboat.

3. A substantial portion of the proposed Warner Road Overlook is reserved for new roadway construction as an integral activity of the site. Also cited in MnDOT's Development Guide, "Great River Road participation will include land acquisition and relocation of the adjacent piggyback operation. Warner Road will be set back from the river, creating a long, narrow open space along the river's edge. The road will be widened to a four-lane divided parkway." Preliminary analysis concludes that detailed design of either freeway Alternate B or Alternates J and K can reflect current alternate development plans for the site.

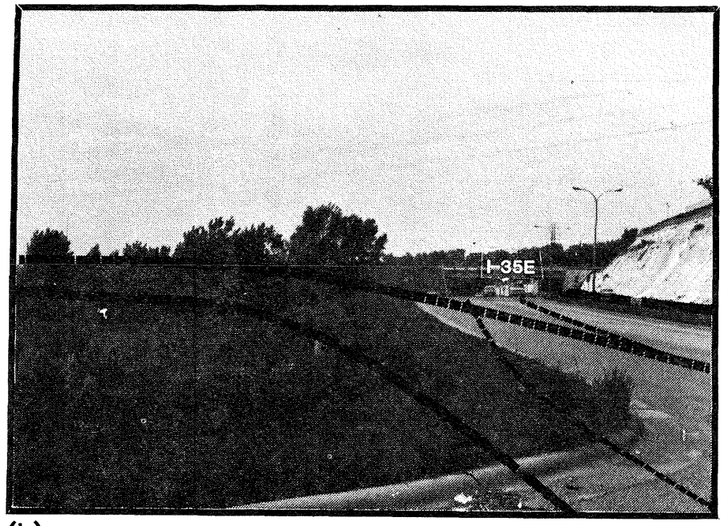
Crosby Farm Regional Park and Proposed Park Addition

Crosby Farm Regional Park and the proposed park addition, including a proposed trail system along Shepard Road and the Fountain Cave Historic Site will be treated together as one 4(f) property (see Figure 31a). This treatment has been chosen for the following reasons.

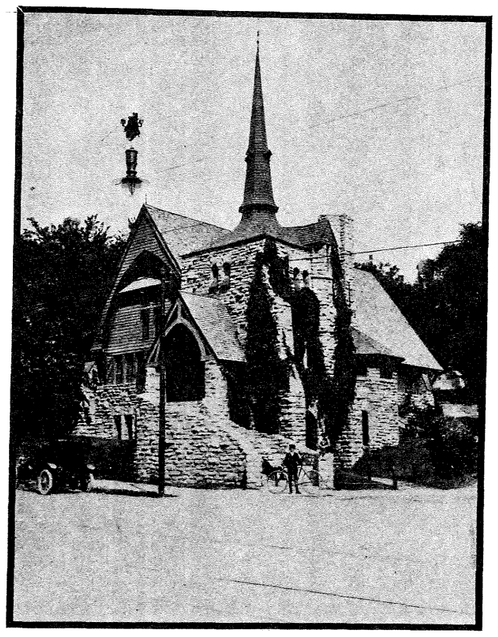
1. Although its existing use is an automobile salvage yard, the proposed park addition is partially in public ownership, owned by the City of St. Paul Port Authority. Moreover, insomuch as development of the proposed park addition reflects upon the existing Crosby Farm Regional Park, the addition shall be considered as part of the 4(f) analysis for the existing site.



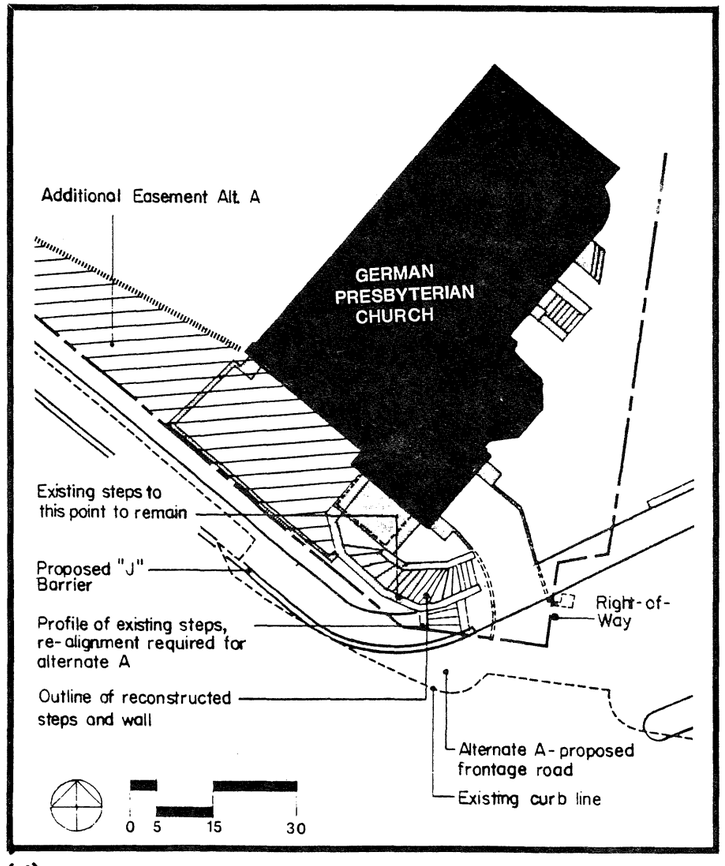
(a)



(b)



(c)



(d)

FIGURE 31

4(f) PROPERTIES

(a) CROSBY PARK AND PROPOSED ADDITION

(b) CROSBY FARM REGIONAL PARK

(c) GERMAN PRESBYTERIAN CHURCH

(d) GERMAN PRESBYTERIAN CHURCH

I35E

2. Included within the city's development plan for the Crosby Farm Park Addition is a proposed bicycle and pedestrian trail system along Shepard Road which would link the park addition to the existing park. In addition, current development schemes of the City Parks and Recreation Department indicate that the Fountain Cave Marker Site will be included in this development of the proposed Crosby Farm Park addition. As such, these components will be addressed in the 4(f) analysis.

Property Description

The Crosby Farm Regional Park is comprised of 596 acres of Mississippi bottom lands. The proposed addition to the park will consist of another 8.5 acres of riverfront property. The proposed trail system will be contained within the existing Shepard Road right-of-way. Crosby Farm Park is part of the metropolitan regional park system. It has been established as such because it possesses a diversity of natural resources. The park is a good example of a typical floodplain forest. It is also unique because of the presence of two inland lakes, one of which (Crosby Lake) has been classified as a type 4 Inland Deep Fresh Marsh by the Fish and Wildlife Service. The park's combination of floodplain forest, upland forest, freshwater marsh, field, and open water provides high quality wildlife habitat for a variety of species. Also found within the park is a paleontological feature containing strata of Ordovician fossils. All of the above components establish the park's importance as a regional recreational area.

The proposed Crosby Park addition has potential as a recreational resource due to its riverfront location. However, its existing use precludes any current recreational use.

The Fountain Cave Historic Marker, located on the south side of Shepard Road, is available for historic interpretation by travelers on Shepard Road. The cave itself has been partially backfilled for construction of the existing Shepard Road, and as such is not likely eligible for inclusion on the National Register.

Activities and Use

The existing park is split into two parcels by the presence of the Lexington Avenue Bridge. Most activity within the park takes place on the west side of Lexington Avenue. The park is designed for passive, day use. Trails and picnic grounds are provided for hiking and picnicking. Cross-country skiing is popular in the wintertime. Nature interpretation and study are the most common uses of the park. Parkland on the east side of the Lexington Avenue Bridge is reserved for wildlife during periods of overcrowding, although park visitors are allowed to use this area.

The proposed park addition is planned to accommodate similar activities and use as the existing park. The conceptual plan for the addition depicts an internal trail system which leads park users to picnic areas. In addition, the proposed pathway connecting the

addition to the existing park will allow for hiking, jogging and bicycling, with an opportunity for historical interpretation provided at the Fountain Cave Marker. In order to prevent excessive erosion of the bluff and cave entrance, the cave itself will not be developed for interpretive use.

Relationship to Similarly Used Lands

The Crosby Farm Regional Park is categorized in the Metropolitan Council's Open Space Plan as one of 17 regional parks within the metropolitan area. Because of its location on the Mississippi River, the park is included in several river-oriented, open space plans. Crosby Farm is located in an Urban Open Space District as designated by the Minnesota Critical Areas Act. Lands in this district are to be managed to conserve and protect existing and potential recreational resources. The development of the Crosby Farm Park addition and proposed trail system is recognized as part of the federally-designated Great River Road Project. The Great River Road plan calls for the construction of the bicycle/pedestrian trail system as a roadway amenity. However, the trails could be constructed independently of this program. The trail system would provide linkage to other parklands along the river, including Fort Snelling State Park, Lillydale Regional Park in Dakota County, and Indian Mounds Regional Park in St. Paul. The development program for the Great River Road in St. Paul is reflected in the city's River Corridor Plan which states "The Mississippi River Corridor open space system will be a continuous publicly-owned and maintained river-oriented park. It will unite all major open space elements and provide a variety of river experiences."

Access

Vehicular access to the existing Crosby Farm Park is located at the park's northern boundary off of Mississippi Boulevard, west of Lexington Avenue. This is the only existing entrance to the park and will be maintained as such. Pedestrian access to the eastern portion of the park is provided by a pathway under the Lexington Avenue Bridge.

The planned location for vehicular access to the proposed Crosby Park Addition is at the Randolph/Shepard intersection. Pedestrians and bikers may also enter the park from the east or west on the proposed trail system.

Access to the Fountain Cave Historic Marker presently exists as a roadway turnoff on the south side of Shepard Road.

Location and Amount of Taking

Approximately three acres of the Crosby Farm Regional Park would be required for right-of-way for the implementation of I-35E project Alternate B. This amounts to less than one percent of the park's total acreage. The potential taking would occur on the northern boundary of the park along the river bluff as the roadway alignment turns east from Lexington Avenue onto Shepard Road (see Figure 31b).

Approximately four acres (43%) of the proposed Crosby Farm Park addition would be taken under implementation of Alternate B. In addition, right-of-way for this roadway alternate would encroach upon the trail system proposed along the south side of existing Shepard Road and would take the property on which the Fountain Cave Historic Marker is located.

Access to the existing Crosby Farm Park will not be affected by project Alternate B. However, there is potential for the pathway connecting the east and west side of the park to be disturbed. Access to the proposed park addition would be severed by Alternate B.

Section 6(f) Requirements

6(f) involvement occurs when an impacted property has used Land and Water Conservation funds (LAWCON) in its development and requires replacement in kind of the property taken. Because of the involvement of LAWCON funds in developing Crosby Farm Regional Park, under Alternate B, replacement would be negotiated as part of mitigation for this property. If the Shepard Road freeway is chosen as the preferred alternative, replacement schemes will be analyzed in further detail.

In addition, the Metropolitan Council's Open Space Policy 18 requires 6(f) type conversion in all cases involving regional recreational open space areas regardless of the funding source. If properties identified for the Crosby Farm Regional Park addition are acquired prior to the construction of Project Alternate B and are identified as regional in nature by the Metropolitan Council, 6(f) type conversion will also be required in this instance.

Physical Effects on Property

The taking of property in Crosby Farm Regional Park will affect the park's interpretive resources. The following impacts due to the construction and operation of Alternate B have been identified.

1. Potential removal of paleontological features contained in the river bluff strata.
2. Direct loss of floodplain forest vegetation.
3. Indirect impacts on less disturbed floodplain forest at the base of the bluff as the result of the removal of vegetation barriers. Vegetation at the base of the bluff will be susceptible to impacts of construction run-off and highway run-off and spray during operation.
4. Temporary soil erosion on the bluff after removal of vegetation.
5. Disturbance and displacement of wildlife by construction noise and increased human activity.
6. Potential disruption of wildlife movement and pedestrian access between the east and west side of the park.
7. Potential air quality impacts include fugitive dust during the construction period.
8. Disturbance to park visitors using the east side of the park due to increased noise levels during construction and operation of the freeway.

Ownership

The existing Crosby Farm Regional Park is owned and managed by the City of St. Paul. The majority of property in the proposed Crosby Park addition is held by the St. Paul Port Authority which has agreed to turn the property over to the City Parks and Recreation Department for recreational development. The city has yet to acquire approximately one to two acres of the proposed park site which is currently in private ownership.

The proposed trail system is planned to be constructed within the city-owned street right-of-way for the existing Shepard Road.

Alternatives to the Use of Parkland Property

Selection of any of the I-35E project alternatives other than Alternate B would avoid encroachment upon any of the subject recreational properties. Pleasant Avenue alternates A, A', C - H, J and K and the no-build option would not require the use of Crosby Farm Regional Park or associated properties.

Measures to Minimize Harm

If Alternate B is chosen as the preferred I-35E roadway alternative, measures to minimize impacts to the existing and proposed parklands would be adopted. The following have been identified as possible mitigation measures.

1. Replacement in kind of the property taken as discussed previously under Section 6(f) requirements.
2. Relocation of the Fountain Cave Historic Marker. Efforts to relocate the marker would be coordinated with the State Historic Preservation Office.
3. Any significant paleontological resources on Crosby Farm Park should be inventoried and curated.
4. Preservation of trees and shrubs including snags, beyond construction limits.
5. Immediate reparation of construction-related damage to trees and shrubs.
6. Use of selected plantings to benefit songbirds and other wildlife.
7. Use of salt-tolerant vegetation for seeding and replanting programs.
8. Restricted use of deicing salt.
9. Design and implementation of a spill contingency plan.
10. Minimization of land clearing and exposure of bare soil, mulching of bare soil, and utilization of sediment traps and berms.
11. Construction of earth berms, walls or other structures to reduce noise levels where appropriate. Care should be taken that such measures do not disrupt the aesthetic quality of the park environment.

HISTORIC SITES

An inventory of historic sites and analysis of impacts has been conducted under the provisions of Section 106 of the National Historic Preservation Act of 1966 and Executive Order 11593. Properties identified as eligible for Section 106 review which are also subject to 4(f) involvement will be documented here and are listed below.

1. German Presbyterian Church (Cass Gilbert)
   311 Ramsey Street

2. St. Paul Union Depot
   214 Fourth Street East

3. Robert Street Bridge
   Robert Street over the Mississippi River

4. Chapel of Saint Paul (Gaultier Chapel)
   Below Kellogg Boulevard at Robert Street

5. Irvine Park Historic District
   223 - 224 Walnut Street

6. Butternut Avenue Historic District
   Butternut Avenue between Otto and Bay Streets

7. Chicago Greatwestern Lift Bridge
   Robert Street over the Mississippi

8. Northern Pacific Freight House
   Fourth Street, immediately east of the Lafayette Freeway

Figure 29 illustrates the relationship of these sites to I-35E alternate project corridors.

At this drafting of the Environmental Impact Statement, neither a formal determination of eligibility nor application of the "Criteria of Effect" and "Criteria of Adverse Effect" (36 CRF 800.3) has yet been completed. The following documentation of eligibility and impacts has been compiled in consultation with SHPO and FHWA. Coordination with the regional FHWA office, the Department of the Interior and the ACHP will be documented in the Final EIS. In addition, it should be noted that the mitigation measures suggested herein are tentative. Adoption of mitigation measures will be accomplished through the 106 process as decided by the ACHP, SHPO, and FHWA.

Analysis of Individual Properties:

German Presbyterian Church (Cass Gilbert Church)

Property Description

The German Presbyterian Church is a National Register site by virtue of its location within the Historic Hill District, which is listed on the

National Register of Historic Places. The church, built in 1890, was designed by Cass Gilbert. Set into a sloping hillside, the design of the church is reminiscent of small mountain chapels in the Alps (see Figure 31c). The one and one-half story building is constructed of rough-faced dolostone. It is marked by a steeply gabled roof, and a combination of three design elements, including a square tower, slender chimney and octagonal bay. A sweeping stone stair leads to the street. The church is in an excellent state of preservation.

Activities and Use

A congregation of German-speaking emigrants established the church. The original congregation disbanded in 1916. Since then, the building has been used for a variety of institutional purposes. The church has recently undergone renovation and is currently used as office space.

Relationship to Similarly Used Land

The church has significance as part of the 75-block, residential Historic Hill District. The church is located in the southeastern portion of the district in what is known as the "Ramsey Hill" area. The building is noted as one of the architect's favorite designs.

Access

The church is currently accessible from Grand Avenue on the south, Ramsey Avenue on the northwest, and from Pleasant Avenue on the northeast. Limited parking is provided by a turnout on Ramsey Avenue in front of the church and an alley in back of the church on its north side. MnDOT purchased controlled access to the church in 1970 during the original acquisition of property in the Pleasant Avenue corridor. Under any of the Pleasant Avenue alternatives, vehicular access to the church would be prohibited. Access control is needed due to the proximity of the church to the proposed intersection. Pedestrian access will still be provided.

Location and Amount of Taking

Use of property belonging to the German Presbyterian Church will be required under all of the Pleasant Avenue alternatives, Alternatives A, A', C, D, E, F, G, H, J and K. Although the Minnesota Department of Transportation had purchased right-of-way in the vicinity of the church on Pleasant Avenue in the early 1970's, prior to designation of the Historic Hill District, coordination with MnDOT indicates that additional property will be required for construction easement and right-of-way. Alternate A, the six-lane freeway, has been identified as the worst-case taking and would require the use of 1760 square feet of church property for construction easement and an additional 300 square feet for right-of-way purposes (see Figure 31d). The remainder of the Pleasant Avenue alternates would require the use of approximately 168 square feet of church property for roadway construction easement.

The baseline elevation for the I-35E roadway and the proposed speed limit for Grand/Ramsey overpass generate the need for grade adjustment northward up the hill on Ramsey Avenue. Under Alternate A, this would require the existing grade adjacent to the south wall of the church and the wall forming the entry steps to the church to be increased by approximately 3'-0". This grade adjustment will require the taking of the bottom risers of the steps.

Under the remaining Pleasant Avenue alternates, a lower speed at the base of Ramsey Street is assumed. Elevations for the proposed overpass in this area could be lowered, thus reducing the adjustment of grade at the church walls to a minimum.

Other Physical Effects on Property

The church property would suffer visual impacts under construction of a Pleasant Avenue roadway. Taking of the bottom entrance steps and filling along the front wall of the church would disrupt the proportion and continuity of the building design. Refer to the section "Measures to Minimize Harm" for this property.

Ownership

The German Presbyterian Church is privately owned by a citizen of St. Paul.

Alternatives to the Use of 4(f) Property

Selection of Alternate B (Shepard Road freeway) or Alternative I (the no-build option) as the preferred alternative would avoid use of the church property.

Measures to Minimize Harm

Mitigation measures to alleviate impacts to this structure are shown on Figure 31d and involve the following:

1. Adjustment of grade adjacent to the structure and reorientation of the entrance wall as required by the removal of the bottom risers. Grade adjustment could be as great as 3'-0" against the foundation wall for the steps. Risers would be rebuilt out of like material.

2. Construction of a "J" type barrier between the wall and roadway to separate them and eliminate the need to touch the foundation for the steps by adjusting grade.

It should be noted that although the latter mitigation measure would allow the pedestrian view of the church to remain unaltered, the protective barrier would cause the view from the road to be partially blocked.

The mitigation measures outlined above apply for the six-lane freeway Alternative A. If the preferred alternative selected is any Pleasant

Avenue alternate other than A, the impacts to the structure will be of a lesser degree. Additional mitigation measures will be examined once selection of the preferred alternative has been made.

St. Paul Union Depot

Property Description

The St. Paul Union Depot is listed on the National Register of Historic Places. It is noted as both an architectural and historic landmark in St. Paul. The depot was designed by the Chicago architect Charles F. Frost and was built between 1917 and 1923. Constructed of Bedford stone, the 250,000 square foot terminal is monumental in scale and design, in the discipline of the Neo-classical, Beaux Arts style. The depot is composed of a lobby and passenger concourse, the latter of which will be directly affected by Alternate B. The concourse is a vaulted area, formerly spanning 17 sets of railroad tracks below. The interior of the concourse is primarily a plaster surface, of which the most distinctive characteristic is the shallow sculptural relief along the perimeter cornice line of the room. This depicts the history and evolution of transportation in the Upper Midwest area. Guastavino tile, a material once used widely in public buildings, is used as a surface material on the vaulted ribbed ceiling, which supports three large skylights. The original arrival and departure mahogany train stands, symbolic of the entire structure, have undergone very little alteration, despite years of intensive use.

Activities and Use

Prior to 1881 each railroad in St. Paul had its own depot. The inconvenience caused to passengers induced the railroads to enter into a cooperative project to build a union depot. The original depot, which occupied the same block as the present Union Depot concourse, lacked the capacity to meet the needs of increased passenger and freight traffic and was outdated by the mid 1880s. Hence, the present Union Depot was constructed.

At the time of its completion in 1923, the St. Paul Union Depot was a landmark of westward rail expansion and a symbol of the vast railroading empire established in St. Paul by James J. Hill. This National Register site signifies the importance that railroad transportation played in the early growth and expansion of St. Paul and the Northwest.

The depot no longer is used for transportation purposes. The tracks under the concourse have been paved for use as a parking lot, and the terminal is minimally used as a storage facility. Feasibility studies are currently underway to explore future alternative uses for the depot.

Relationship to Similarly Used Lands

Passenger rail service for the Twin Cities Metropolitan Area has been consolidated and is now provided at the Amtrak terminal located in the Midway area of Minneapolis.

Access

Access to the depot as well as parking is provided off of Fourth Street along the north entrance to the building.

Location and Amount of Taking

Under project Alternate B, a proposed exit ramp from Shepard Road to Sibley Street will result in a direct impact to the St. Paul Union Depot concourse. Roadway alignments indicate that the southernmost 15 feet of the structure would be removed. In coordination with MnDOT, it was concluded that an additional 15 feet could be expected to be taken as part of roadway construction easements, normally required by R.O.W. Access to this site will not be affected (see Figure 32a).

Ownership

The St. Paul Union Depot property is presently owned by the U.S. Postal Service.

Alternatives to the Use of 4(f) Property

Selection of any I-35E project alternate other than B would avoid use of the depot property.

Measures to Minimize Harm

If Alternate B is chosen as the preferred alternative, the following mitigation measures should be considered:

1. Document and carefully photograph the existing south wall of the concourse, using HABS criteria.

2. Disassemble the south wall, concrete vault that forms the last position ahead of the skylight.

3. Preserve any friezes along the continuous entablature.

4. Reconstruct the south wall and detail work.

5. Utilize any remaining decorative tile work, etc., as part of a display relative to the history associated with the building.

Figure 32b illustrates the proposed mitigation measures listed above.

Robert Street Bridge

Property Description

The Robert Street Bridge spans across the Mississippi River at Robert Street (see Figure 32c). The structure, designed by the engineering firm Toltz, King, Duvall and Anderson, was built in 1926. The bridge design is an Art Deco style, typical of the "Modern" movement. The main span consists of a reinforced concrete arch from which the deck

system of encased structural steel is suspended. River conditions required that the bridge height be at least 90 feet above the water surface in the navigable channel. The bridge is 1920 feet long, 56 feet wide from curb to curb with a twelve foot wide sidewalk on each side. The bridge is considered an outstanding architectural example of an early concrete arch bridge. It is potentially eligible for inclusion on the National Register.

Use

The bridge is used for transportation. It currently carries vehicular traffic across the Mississippi River. Sidewalks along the bridge allow for pedestrian travel as well.

Relationship to Similarly Used Land

The Robert Street Bridge is one of five bridges which traverses the Mississippi River into St. Paul. Of the five, the Lexington Avenue, Lafayette, and Robert Street bridges are the more important traffic carriers. The Robert Street Bridge is unique because of its architectural style.

Location and Amount of Taking

Construction of Alternate B would take a portion of the bridge. Roadway alignments indicate that at least two of the three arches north of the main span would have to be removed and reconstructed, seriously affecting the design integrity of the structure. The main span would not be affected. This impact is generated by the elevation of the roadway needed to match the proposed exit ramp at Sibley with the I-35E mainline. Not enough clearance exists under the two arches to miss the structure. Construction activity will be the only impact on this structure.

Ownership

The bridge is in public ownership as a transportation easement.

Alternatives to the Use of 4(f) Property

Selection of any of I-35E project alternatives other than B would avoid impacts to the Robert Street Bridge.

Measures to Minimize Harm

In order to attain the clearances required by federal highway standards at the northern two arches of the Robert Street Bridge, the I-35E mainline elevation would have to be lowered. If Alternate B is selected, feasibility studies should be undertaken to see if the adjustment could be achieved.

FIGURE 32

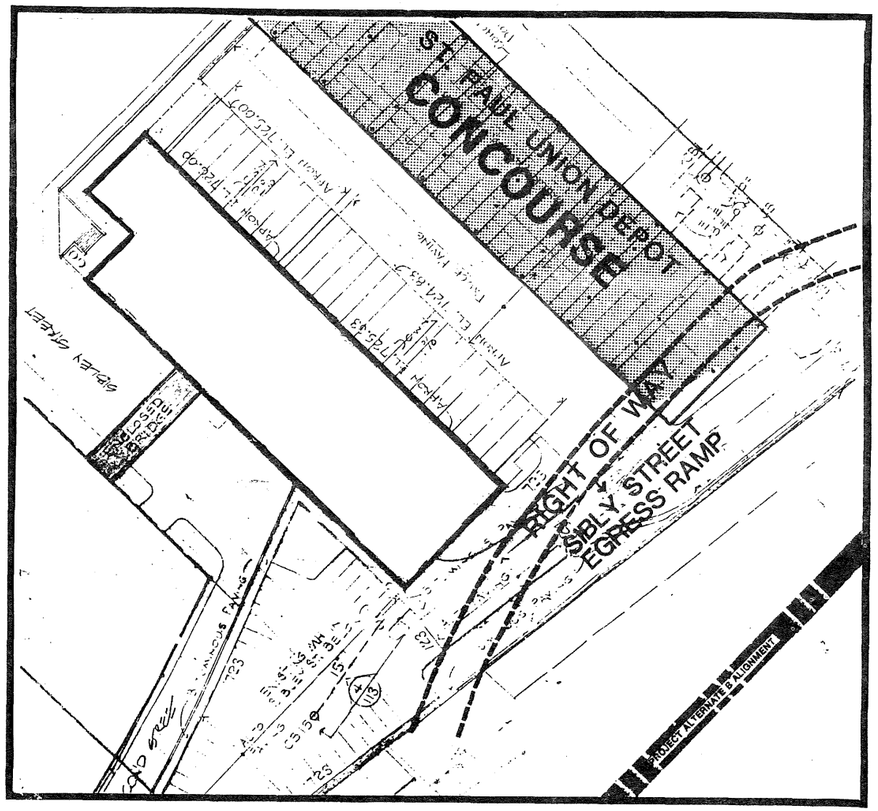
4 (f) PROPERTIES

(a) ST. PAUL UNION DEPOT

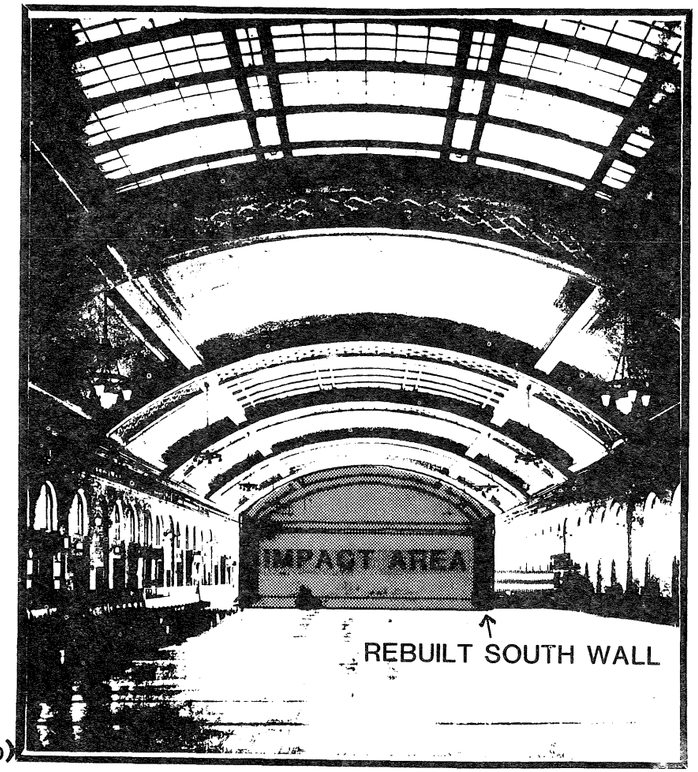
(b) ST. PAUL UNION DEPOT

(c) ROBERT STREET BRIDGE

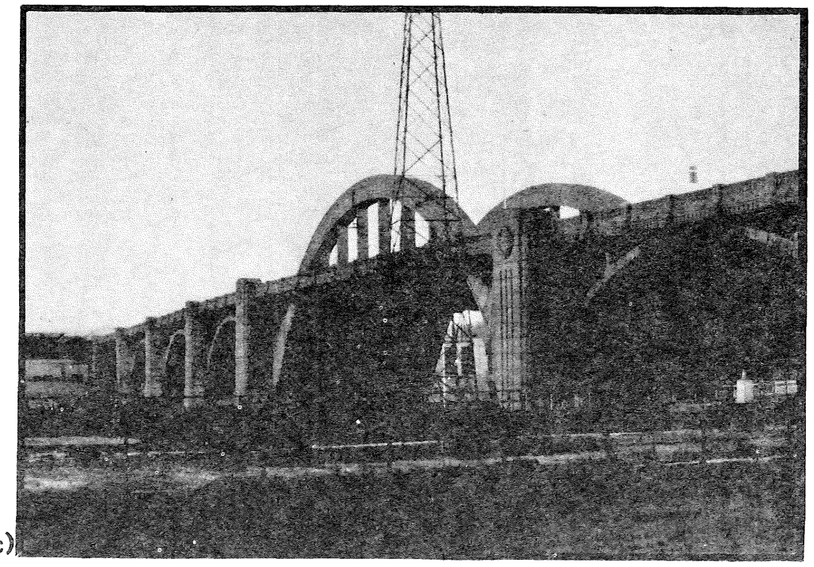
(d) CHAPEL OF ST. PAUL (SITE & MARKER)



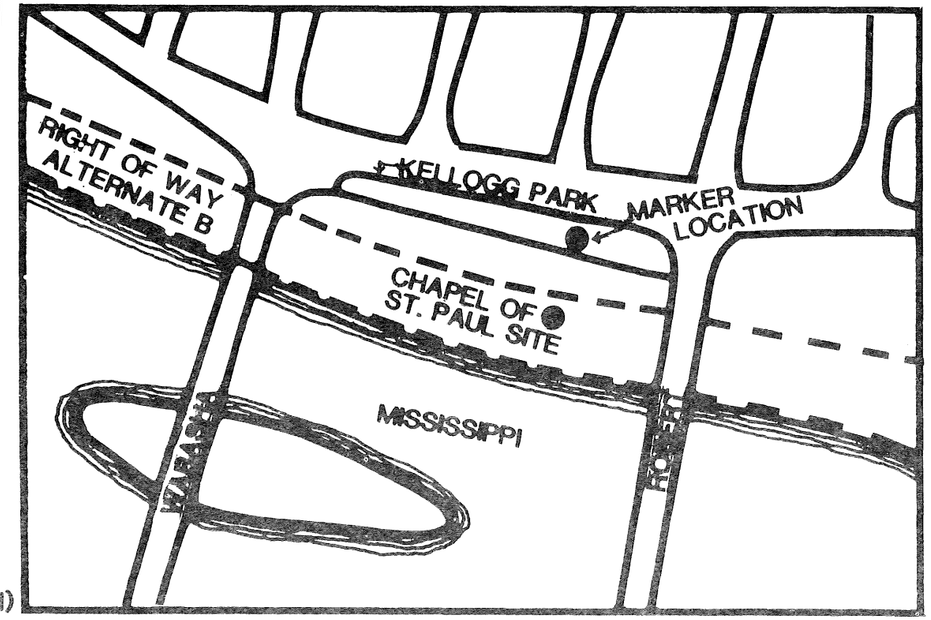
(a)



(b)



(c)



(d)

I35E

Chapel of St. Paul (Gaultier Chapel)

Property Description

The Chapel of St. Paul is listed on the Minnesota Register of Historic Sites. The site is designated by a marker located on the bluff in Kellogg Park. The actual site, located below the bluff on city block 33, lots 2, 3, and a fractional part of lot 1, is not subject to historic interpretation (see Figure 32d). Because of previous construction activity, all historic and archeological features of the former log structure have likely disappeared. Therefore, the site is not likely eligible for inclusion on the National Register.

Use

The Chapel of St. Paul was once used for religious worship. The marker is presently used for historic interpretation.

Relationship to Similarly Used Lands

The Chapel site, founded in 1849 by Father Gaultier, is one of six sites in the Shepard Road corridor which relate to the early exploration and settlement of St. Paul. The others include Fountain Cave, Upper Landing, Lower Landing, Phalen's Cabin, and Chestnut Street Industries District. Construction of bridges, railroads, a levee and the original Shepard Road have eliminated evidence of the historic and archeological features of most of these sites. With the exception of the Chestnut Street Industries District, all of these sites are marked by historic markers which, except for the Fountain Cave site, are located in Kellogg Park. The Chapel of St. Paul is the only site which is included on the State Register.

Access

The marker is accessible to pedestrians in Kellogg Park. The site itself is inaccessible due to present railroad and roadway uses.

Location and Amount of Taking

Project alignments indicate that encroachment upon the property comprising the site below the bluff would occur under implementation of Alternate B. The plaque which marks the site would remain unaffected.

Ownership

Both the chapel site and the historic marker are located on property owned by the City of St. Paul.

Alternatives to the Use of 4(f) Property

The selection of any I-35E project alternative other than B would avoid encroachment upon the chapel site.

Measures to Minimize Harm

If Alternate B is selected as the preferred alternative, a construction monitoring program should be undertaken at the location of the Chapel site. Should historic or archeological features be disclosed by terrain modifications during construction, appropriate procedures for recovering data should be implemented.

Irvine Park Historic District: Wright-Prendergast House, Henry Horn House

Property Description

Designated on the National Register as a Historic District, Irvine Park encompasses approximately 20 acres. It is comprised of 26 homes built around a park which was donated to the city in 1849. The park has been reconstructed in its original design with a Victorian Fountain, walkways and landscaping. Irvine Park Historic District represents the most cohesive group of pre-Civil War homes in Minnesota. It became one of the first residential neighborhoods in the city, nine years prior to Minnesota statehood in 1858. The Alexander Ramsey residence, belonging to the state's first territorial governor, is located in the district.

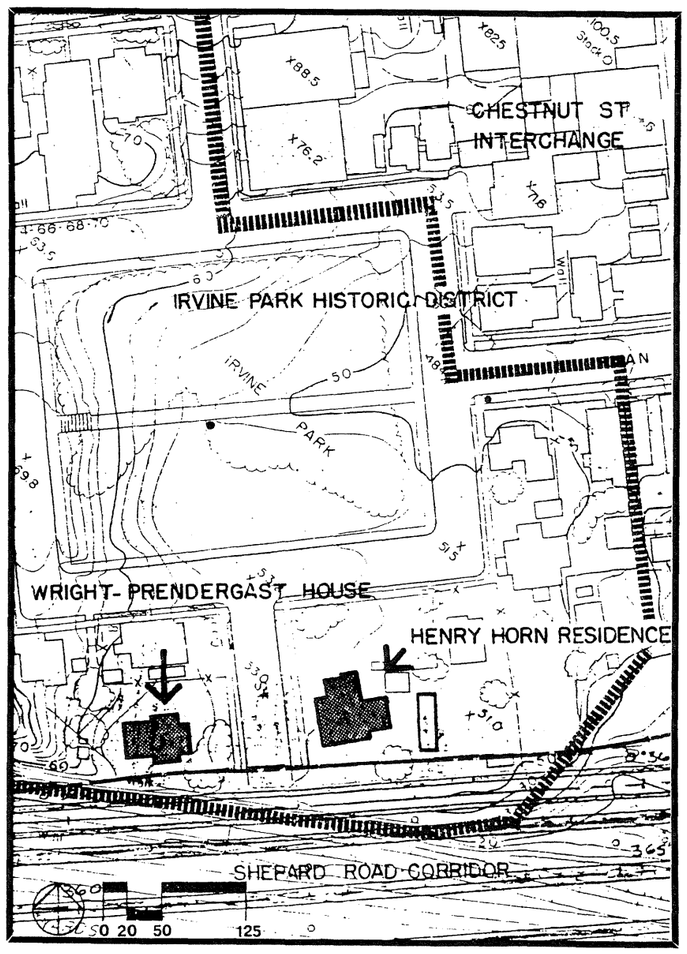
The property of two residences in the district, the Wright-Prendergast house and the Henry Horn house, could potentially be taken by construction of I-35E (see Figure 33a). Both properties are located on the southern edge of the historic district. The Wright-Prendergast house, built in 1851 and renovated in 1903, is in a good state of preservation. It is a wooden building characteristic of Greek Revival architecture. The Henry Horn house, also constructed of wood, was built in 1873. It is presently in fair condition.

Use

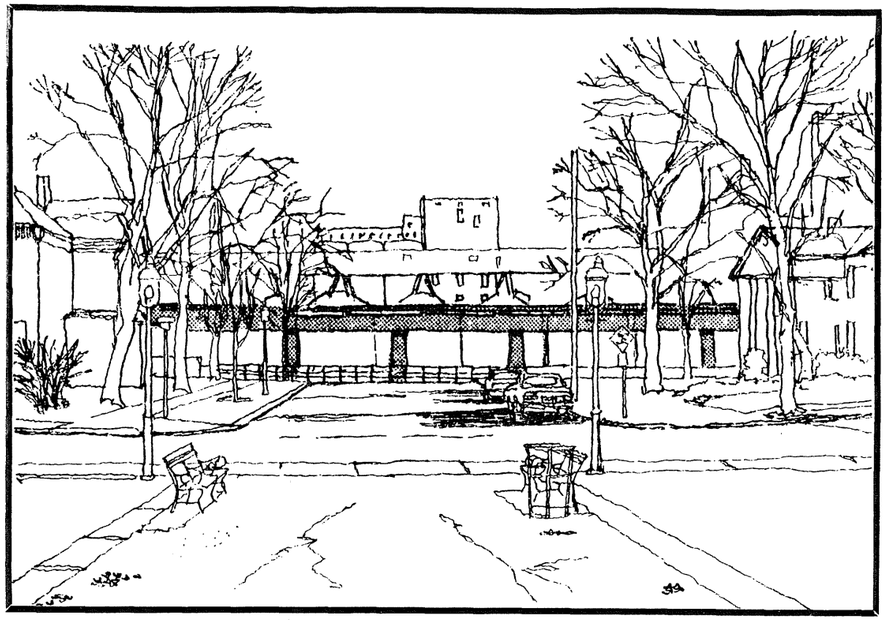
With the exception of Irvine Park, land use in the district is residential. Both the Wright-Prendergast and Henry Horn houses are private residences. The district is used for historic interpretation.

Relationship to Similarly Used Land

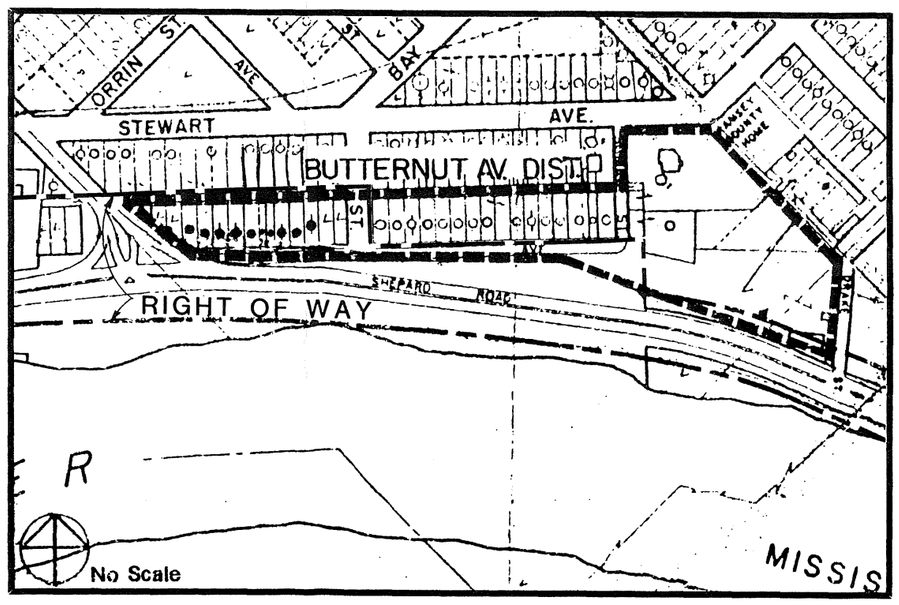
The Irvine Park Historic District is one of three National Register districts in the Primary Impact Area. The others are the Historic Hill District and Woodland Park Historic District. (The location of the Woodland Park Historic District is shown on Figure 29). In addition, a group of residences related to the former Banholzer Brewery in the Shepard Road corridor are proposed as eligible for inclusion as a National Historic District. Irvine Park is also addressed in the development guide for the Great River Road Project. A spur from the designated route on Shepard Road is proposed to provide access to the Historic District and to link it with other historic and recreational resources along the riverfront.



(a)



(b)



(c)

FIGURE 33

4(f) PROPERTIES

(a) IRVINE PARK HISTORIC DISTRICT

(b) VIEW FROM IRVINE PARK

(c) BUTTERNUT AVE. HISTORIC DISTRICT

135E

Access

The district is accessible from the north, east, or west on any of the streets which form its border. The two properties which may be directly affected by the proposed I-35E are accessible only from the north.

Location and Amount of Taking

Construction of the Shepard Road freeway alternate would physically take part of the historic district. Proposed layouts currently call for an elevated, westbound on-ramp to be constructed above the existing bluffline which forms the southern boundary of the district. This would require removal of approximately 250 feet of a retaining wall along the bluff. The wall varies in height, averaging approximately 30 feet.

Moreover, roadway alignments indicate that an irregular trapezoidal section of the district, roughly 390 x 70 feet at its greatest dimension would be taken for right-of-way at the location of the Wright-Prendergast and Henry Horn properties. Right-of-way limits would come within 10 feet of the Wright-Prendergast house, within 15 feet of the Henry Horn house, and within 5 feet of an ancillary structure on the east edge of the Henry Horn site. None of the buildings will be physically taken.

Other Physical Effects on Property

If Alternate B is selected, airborne pollution in the form of particulates (TSP) would be generated by construction equipment. Construction would also cause distracting levels of vibration to be experienced at the Wright-Prendergast and Henry Horn residences. Aesthetics, noise and freeway lighting from the elevated roadway at the district's southern boundary would adversely impact the unique residential and park environment. Figure 33b illustrates the view of elevated roadway from Irvine Park.

Ownership

The Wright-Prendergast and Henry Horn properties are both privately-owned residences.

Alternatives to the Use of 4(f) Land

Selection of any of the I-35E project alternates other than B would avoid encroachment upon property within the Irvine Park Historic District.

Measures to Minimize Harm

If Alternate B is selected, a possible measure to mitigate impacts to the Irvine Park District would be to lower the elevated portion of the roadway so that it lies below the existing bluffline.

Proposed Butternut Avenue Historic District

Property Description

The proposed Butternut Avenue Historic District containing homes located at 795 - 681 Butternut Avenue and 680 Stewart Avenue, and the north Mississippi Brewery cave site is considered potentially eligible for inclusion on the National Register.

Homes built along 795 - 695 Butternut represent a homogenous grouping of private dwellings built between the years 1884 and 1915. The homes are of similar size and scale, measuring 14 feet to 16 feet in width, 26 feet in length and one and one-half stories in height. Their overall proportions are created by a similar design of a simple rectangular plan, with an extended one-story porch and hipped roof. They express a plain vernacular building style, clad in wood clapboard or brick. They are spaced approximately 15 feet from each other and equally set back 20 feet from the road.

The integrity of the homes is relatively unaltered. They are in good condition and exist in their original location.

Two other homes within the district are of significantly larger scale and stature than those along 795 - 695 Butternut. The residence at 680 Butternut was built in 1889 by William Banholzer for his father Frederick Banholzer, owner of the North Mississippi Brewery. The home, built in a formal, vernacular, Georgian style, is in excellent condition.

The residence at 681 Stewart was built by William Banholzer in 1885 as his private residence. It is unique within the City of St. Paul as an example of a Victorian era, Second Empire style manor and is in excellent condition.

The foundation of structures which may have been associated with the North Mississippi Brewery (Banholzer Brewery) are located in the eastern portion of the proposed historic district. An insurance map dated 1884 indicates that the main brewery building was located on the river's edge. The building was taken for right-of-way of the existing Shepard Road. The cave system associated with the brewery is still in existence but has been partially backfilled as the result of construction of Shepard Road. An entrance to the cave system exists in the basement of the Frederick Banholzer residence.

Use

Land use in the proposed historic district is residential.

Relationship to Similarly Used Land

There are currently three National Register Historic Districts in the I-35E primary impact area. The homes located in the proposed Butternut Avenue District are significant because of their historic linkage to the North Mississippi Brewery. As noted previously, the

architectural style of the William Banholzer residence is a unique example in St. Paul.

Access

Most of the homes in the proposed district are accessible from Butternut Avenue; other portions of the district can be accessed by Drake Street, Sumac Street, or Stewart Avenue.

Location and Amount of Taking

Construction in the Shepard Road corridor would encroach upon the proposed Butternut Avenue Historic District, requiring the removal or relocation of ten homes located at 795-695 Butternut Avenue. Neither the Frederick Banholzer or the William Banholzer residence would be physically taken (see Figure 33c).

Other Physical Effects on Property

Other impacts to this district would be noise and aesthetics. Construction of any sound barrier as mitigation would create a visual barrier, isolating the district from a view of the river.

Ownership

The homes in the proposed historic district are privately owned.

Alternatives to the Use of 4(f) Land

The selection of any of the I-35E project alternates other than the Shepard Road freeway would avoid encroachment upon the proposed Butternut Avenue Historic District.

Measures to Minimize Harm

Meetings with MnDOT have indicated that the westbound ramp proposed in Alternate B which would affect this proposed district could be realigned so that the properties in question (homes along Butternut Avenue) would not have to be removed or relocated. A detailed description of ramp realignment will be provided if Alternate B is chosen as the preferred alternative.

Chicago Greatwestern Lift Bridge

Property Description

The Chicago Greatwestern aerial lift bridge is considered potentially eligible for inclusion on the National Register. It was built in 1925 by the Chicago Greatwestern Railroad Company, replacing an earlier swing bridge in that location. In 1927, due to changes in railyard topography associated with the construction of the St. Paul Union Depot, the north end of the bridge was raised 16 feet. The bridge is a steel beam span structure which carries a single track over the Mississippi River. It consists of eight spans, seven of which are

stationary and one, on the north side of the river, which lifts. The vertical lift truss spans 189 feet across a channel width of 146 feet, with a mean low clearance of 75 feet above water level.

Use

The bridge is actively used by the Chicago Northwestern Railroad Company and Soo Line which has operating rights on the bridge. This line of track serves as a major north-south railway connection passing through the Twin Cities.

Relationship to Similarly Used Land

The lift bridge is a rare bridge type to be found in Minnesota. Only a few others have been identified in the state. It is also considered a unique structure to be found on a railroad line.

Location and Amount of Taking

Proposed layouts indicate that one-half the length of the bridge on the north side of the river would be rendered unusable due to relocation of the connecting Chicago Northwestern mainline track required under construction of the Shepard Road freeway alternative.

Under Alternate B, it is proposed that a new bridge structure be constructed slightly upstream which would connect the relocated trackage with the southern half of the existing bridge.

Ownership

The bridge is part of the mainline railroad track owned by the Chicago Northwestern Railroad Company.

Alternatives to the Use of 4(f) Property

Selection of any of the project alternatives other than B would avoid a taking of the bridge site.

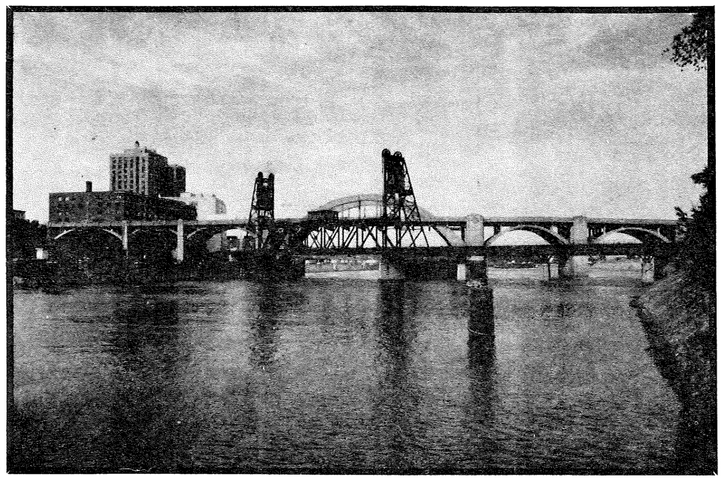
Measures to Minimize Harm

If Alternate B is selected as the preferred alternative, a thorough HAER survey of the affected portion of the bridge should be considered. In addition, the feasibility of reusing the vertical lift truss when constructing the proposed new bridge would be explored.

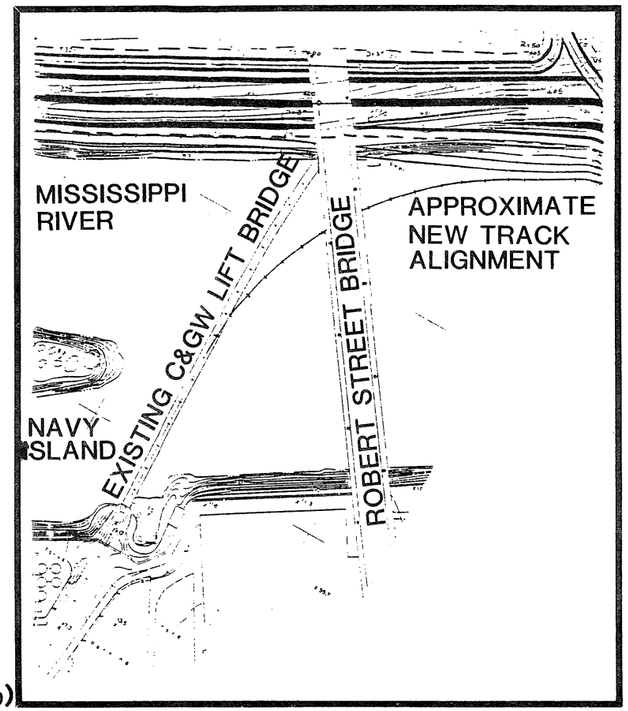
Northern Pacific Freight House

Property Description

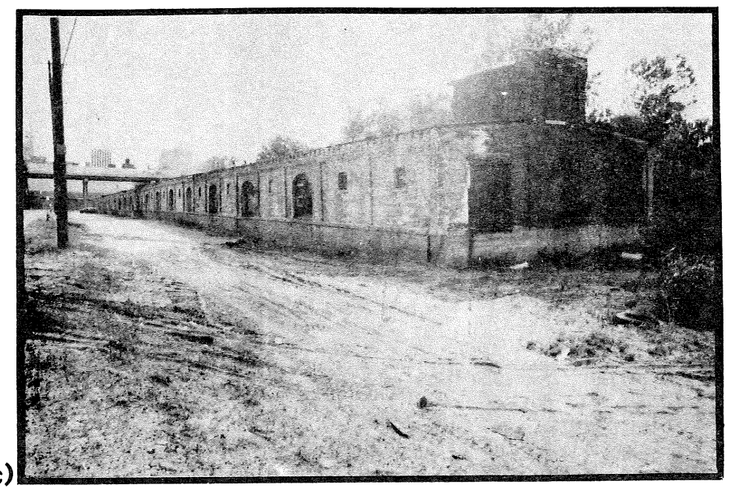
The Northern Pacific Freight House, considered potentially eligible for inclusion on the National Register, was constucted in 1903 or possibly earlier by the Minneapolis and St. Louis Railroad Company and was sold to the Northern Pacific Company in 1903. The freight house was



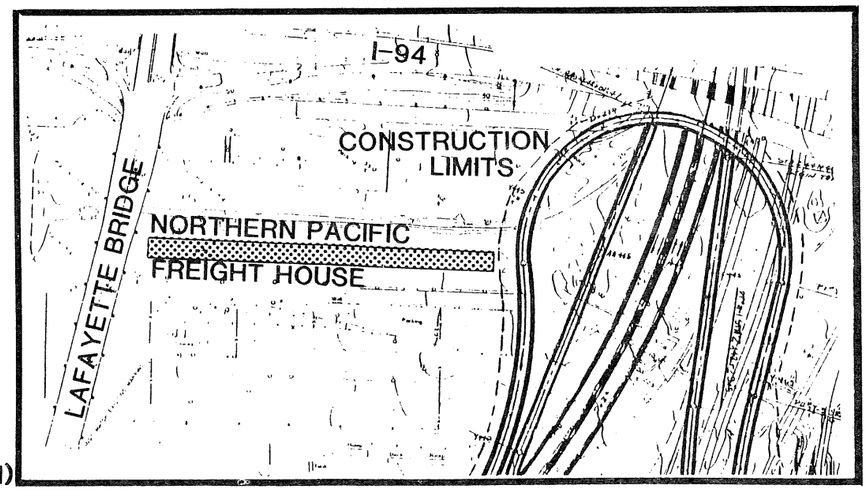
(a)



(b)



(c)



(d)

FIGURE 34

4(f) PROPERTIES

(a) CHICAGO GREAT WESTERN BRIDGE

(b) CHICAGO GREAT WESTERN BRIDGE

(c) NORTHERN PACIFIC FREIGHT HOUSE

(d) NORTHERN PACIFIC FREIGHT HOUSE

135E

built because of an expanding demand for freight service in that area of the city. When built, the dimensions of the building were 940 feet long by 40 feet wide. This simple brick building as it now stands is approximately 725 feet long. The west end of the freight house has recently been remodeled whereas the east end is severely deteriorated.

Use

The building is currently used as a record storage facility for the Burlington Northern Railroad Company. The west end of the building serves as office space for the record storage service and portions of the company's communications department.

Relationship to Similarly Used Lands

The freight house is a remaining example of a building type which was once common to the southwest section of St. Paul. It is significant in relation to its location in a district of early warehouses being studied by the Ramsey County Historical Society.

Access

The freight house may be accessed from the northeast on Fifth Street.

Location and Amount of Taking

Under Alternative B, a portion of the freight house property which presently serves as a parking lot (southeast of the building) would be taken. The encroachment would involve approximately 250 square feet of property. There would be no interference with the freight house itself. However, the roadway would pass within 10 feet of the building.

Other Physical Effects on Property

The close proximity of the proposed roadway to the freight house would create an adverse visual impact on the property. The view of this roadway would be added to existing views of the Third Avenue and Lafayette bridges.

Ownership

The freight house property is currently owned by the Burlington Northern Railroad Company.

Alternatives to the Use of 4(f) Land

Selection of any of the project alternatives other than B would avoid encroachment upon the freight house property.

Measures to Minimize Harm

The building and its roadway access will not be affected. The taking of that portion of the property needed for right-of-way is unavoidable.

Screening of the freeway is possible, should the property be developed to a use sensitive to visual impacts.

COORDINATION WITH JURISDICTIONAL AGENCIES

Materials contained within this document were developed in coordination with the Minnesota SHPO, MnDOT, FHWA and the City of St. Paul. Correspondence from SHPO, listing sites of concern with regard to proposed I-35E project development was incorporated within this analysis. The SHPO has concurred with the determinations documented in this statement.

VII. LIST OF PREPARERS

The following tables list preparers of the Draft Environmental Statement and the special studies which were the technical foundation for the EIS. For a more complete list of preparers of the special studies and expansions on their resumes, see the special studies listed in Appendices C-S.

PREPARERS AND EDITORS OF DRAFT EIS

NAME AND ROLE	EDUCATION			Air Quality	Noise	Historian/Archeology	Economics	Transportion Planning	Mechanical Engineering (Energy)	Hydrology	Geology	Geophysics	Land Use Planning	Socioeconomics	Civil Engineering	Landscape Architecture	Water Quality	Biology	Right-of-Way	Civil Rights
	Bachelor	Master	Ph.D.																	
DRAFT EIS PREPARATION																				
METROPOLITAN COUNCIL																				
Vic Ward	BS						12					12								
Ghaleb Abdul-Rahman	B. Arch	M. Arch						11				11								
Deane Wenger	BS	MS						25						25						
Ann Braden	BA	MURP						4				5								
Lawrence Dallam	BS	MS	Ph.D.					11						16						
MN DEPT. OF TRANSPORTATION																				
Al Hultine	U of M													35						
James Halvorson	BS & BCE			10					1.5											
James Aswegan					8															
Clement Kachelmyer	BCE					13								13						
Delbert Gerdes	BS	MS													13					
Joseph Thomas	BS									3										
Rudy Ford	BA	MS								23	23	23								
Herm Juffer	BS	M. Arch										21			21					
Gerald Larson	BA	MA	Ph.D.										7							
Lawrence Foote	BS	MS	Ph.D.														21			
Frank Pafko	BS															5	5			
Ronald Peterson	BS	MS															3			
FEDERAL HIGHWAY ADMIN.																				
James St. John	BS	MS						12						12						
Roger Larson	BS	MS						20						20						
James McCutcheon	BS	MS								27				27						
Wallace Oien	BS																	17	1	

*Number in matrix indicates the number of years each person has been working in the indicated field.

PREPARERS AND EDITORS OF DRAFT EIS

NAME AND ROLE	EDUCATION			Air Quality	Noise	Historian/Archeology	Economics	Transportation Planning	Mechanical Engineering (Energy)	Hydrology	Geology	Geophysics	Land Use Planning	Socioeconomics	Civil Engineering	Landscape Architecture	Water Quality	Biology	Right-of-Way	Civil Rights
	Bachelor	Master	Ph.D.																	
BARTON-ASCHMAN ASSOC.																				
Cynthia Ray	BA	MURP MSLA				3														
Jerry Edwards	BA	MA	Ph.D.				9													
Michael Costello	BS	MS							7	7										
Carl Ohrn	BS	MS					12					12								
Susan Blachman	BA											1								
Daniel Lutenegger	BS	MS														14	14			

* Number in the matrix indicates the number of years each person has been working in the indicated field.

PREPARERS OF SPECIAL STUDIES

NAME AND ROLE	EDUCATION			Air Quality	Noise	Historian/Archeology	Economics	Transportation Planning	Mechanical Engineering (Energy)	Hydrology	Geology	Geophysics	Land Use Planning	Socioeconomics	Civil Engineering	Landscape Architecture	Water Quality	Biology
	Bachelor	Master	Ph.D.															
William Olender	BS	MS	Ph.D.	6														
Robert Earsy	BS	MS			7													
Jeffrey Howry	BA	MA	Ph.D.			5												
Lorenzo Williams	B Arch					30												
Scott McDonald	BA	MRP					9											
Jerry Edwards	MA	BA	Ph.D.					9										
Ferrol Robinson	BME	MCE							11									
Dennis Palmer	BCE	MS								10								
Kelton Barr	BA	MS								4	4							
Stephan Alsup	BS	MPH MS	Ph.D.									13						
Ronald Matros	BA	MA											18					
Barbra Rovin	BA	MCRP												7				
Darrel Berkowitz (Layout)	BCE														18			
Louis Matis (Soils)	BS	MS													10			
William Short	BLA															8		
Dean Makotky	BA		Ph.D.														5	
Michael Molley	BS	MS																9

*Number in the matrix indicates the number of years each person has been working in the indicated field.

VIII. LIST OF AGENCIES, ORGANIZATIONS AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT

Copies of the following special studies and Draft EISs were sent to the following persons, agencies and organizations:

Person, Agency, Organization	Special Studies Sent
District Engineer Dept. of the Army St. Paul District, Corps of Engineers* 1135 U.S. Post Office & Customs House St. Paul, MN 55101	Wetlands, Fish & Wildlife Hydrogeology Hydrology/Hydraulics River Morphology/Flood Hazard Vibrations
S. W. Thoroughman Chief, Bridge Branch U.S. Coast Guard* Second Coast Guard District 1430 Olive Street St. Louis, MO 63103	Wetlands, Fish & Wildlife Hydrogeology Hydrology/Hydraulics River Morphology/Flood Hazard Vibrations
Sheila Minor, Regional Environmental Officer North Central Region U.S. Dept. of the Interior* 175 W. Jackson Blvd. Chicago, IL 60604	Wetlands, Fish & Wildlife Hydrogeology Water Quality Hydrology/Hydraulics River Morphology/Flood Hazard Historic Sites
Barbara Taylor, Chief Environmental Impact Review Staff Environmental Protection Agency 230 South Dearborn Chicago, IL 60604	Air Quality Soils Water Quality Noise River Morphology/Flood Hazard Energy Wetlands, Fish & Wildlife Historic Sites Land Use Traffic Economics Hydraulics/Hydrology Hydrogeology Aesthetics Social Impacts Vibration
Regional Director, Region 3 Fish and Wildlife Service* U.S. Dept. of the Interior Federal Building Fort Snelling Twin Cities, MN 55111	Wetlands, Fish & Wildlife Hydrogeology Water Quality Hydrology/Hydraulics River Morphology/Flood Hazard

* Indicates a cooperating agency as defined in 40 CFR 1500.

Person, Agency, Organization	Special Studies Sent
Frank D. Jones, Regional Director Lake Central Region National Park Service (HCRS) U.S. Dept. of the Interior Federal Building 200 E. Liberty Ann Arbor, MI 48107	Historic Sites
Upper Mississippi River Basin Commission* 7920 Cedar Avenue South Minneapolis, MN 55420	Wetlands, Fish & Wildlife Hydrogeology Water Quality Hydrology/Hydraulics River Morphology/Flood Hazard Land Use
Joseph Alexander, Commissioner Minnesota Dept. of Natural Resources* Centennial Office Building, 3rd Floor 658 Cedar Street St. Paul, MN 55155	Wetlands, Fish & Wildlife River Morphology/Flood Hazard
Mark Mason, Director Minnesota Energy Agency 150 E. Kellogg Blvd. Room 980 St. Paul, MN 55101	Energy
Executive Director Minnesota Pollution Control Agency* 1935 W. County Road B-2 Roseville, MN 55113	Soils Hydrogeology Water Quality Air Quality Noise
Russel W. Fridley, Director State Historical Preservation Office 690 Cedar Street St. Paul, MN 55101	Historic Sites

*Indicates a cooperating agency as defined in 40 CFR 1500.

IX. COMMENT AND COORDINATION

SCOPING PROCESS

In Phase I of this EIS study process, extensive efforts were made to solicit ideas on issues and concerns relating to the proposed I-35E corridor alternatives. Affected local units of government, and state, federal and metropolitan agencies were asked for their recommendations, positions, or policies regarding alternatives. The corridor selection process is outlined at the beginning of Section II.

Issues, Concerns and Special Studies

In addition to direct contact with affected units of government and agencies, a series of workshops/public information meetings were held in the summer of 1978. Special interest groups as well as the general citizenry contributed ideas on issues and concerns. These concerns were summarized and grouped accordingly to be addressed by the special studies prepared as part of the EIS. They are summarized below.

Air Quality Impacts Report

Air quality impacts on the young, sick and elderly.

Air quality impacts in the vicinities of "critical receptors," e.g. schools, hospitals and housing for the elderly.

Air quality impacts in downtown St. Paul.

Increased air pollution from through traffic.

Water Quality Report

Potential pollution of receiving bodies of water resulting from the construction, operation and maintenance of the proposed roadway.

Spills or hazardous materials from traffic using the roadway.

Preliminary Noise Analysis Report

Noise impacts from truck traffic, generally. Noise impacts from through traffic, generally. Noise impacts on especially sensitive sites, such as hospitals.

Wetlands, Fish and Wildlife Report

Potential taking of wildlife habitat (principally wetlands, but also floodplain and bluff woodlands, shrublands and shortgrass meadows) for proposed roadway.

Potential disruption of established wildlife corridor(s).

Potential deterioration in fish waters.

Potential decrease in rare and endangered species of wildlife.

Archeological Survey and Historic Sites Assessment Reports

That all historic sites of national, state or local significance located in the project corridors be identified and their sites delineated before final design and construction of the roadway facility begins.

Section 4(f) Statements

Harm to public parks, recreation areas, wildlife and waterfowl refuges or any historic sites of national, state or local significance as a result of the construction, operation and maintenance of the roadway.

Land Use Report

Right-of-way required. Dislocation of homes and business. Consistency with land use plans.

Soil Properties Report

Erosion potential. Geologic hazards.

Energy Impact Report

The impact on energy for various alternatives.

Traffic Impacts Report

Potential general traffic congestion within downtown St. Paul under certain project alternatives.

Maintaining adequate auto/truck accessibility to downtown St. Paul and the southwest portion of the City of St. Paul.

The potentially adverse regional redistribution of through traffic if I-35E is not completed.

Increasing use of local streets for through traffic in the southwest St. Paul neighborhoods.

Potential diversion of trucks to downtown St. Paul streets and on city arterials under certain project alternates.

The compatibility of the alternate routings to downtown St. Paul parking access routes.

Central Business District Economic Viability and Development Impact Report

Adequate access to major new development projects and existing development in downtown St. Paul.

General traffic congestion within the vicinity of downtown St. Paul that might adversely affect the downtown development potential.

Capability of downtown St. Paul to attract new retail, office, cultural and entertainment facilities.

Hydraulics/Hydrology, Hydrogeology, River Morphology/Flood Hazard Reports

Impact on stormwater drainage systems.

Raising of flood levels and increase in flood velocities resulting from new roadway structure in Mississippi River floodplain.

Urban Landscape/Aesthetic Analysis Report

Visual impact of roadway noise abatement measures.

Visual impact of roadway from top of Mississippi River bluff in Historic Hill District.

Design "compatibility" of roadway to adjacent land uses.

Views from roadway.

Neighborhoods Project Response - Social Impacts Report

Potential disruption of established public service delivery systems.

Potential moving away of established residents.

Potential decrease in property values potential.

Potential decrease in ready local access.

Potential decrease in neighborhood tranquility.

Potential Impacts - Construction and Operation Vibrations Report

Adverse impact on the operation of hospitals adjacent and near the proposed roadway (particular concern has been noted in regard to the location of the operating rooms of St. Luke's Hospital to the proposed roadway alignment in the Pleasant Avenue corridor).

Structual damage to historic structures in the vicinity of the proposed roadway.

Adverse impact to residents of nursing homes in the vicinity of the proposed roadway.

COORDINATION PROCESS

A series of information meetings and workshops were held in the summer of 1978 where the project was discussed and issues and concerns listed above were raised. In addition, the project management team consulted federal, state and metropolitan agencies and local units of government directly affected by issues related to the proposed I-35E. These agencies and officials were asked to identify:

1. Any adopted transportation goals and objectives.
2. A statement of recommendation regarding the location and function of the proposed I-35E facility, if one has been adopted.
3. A list of issues that have been identified as a result of past I-35E proposals.

The results of these contacts were used in the Phase I evaluation of potential I-35E corridors, and to determine what, if any, special studies were needed to address concerns raised.

A list of local units of government and various agencies contacted follows:

Local Units of Government

Dakota County
Ramsey County
Mendota Heights
Lilydale
Mendota
West St. Paul
Sunfish Lake
Eagen
Inver Grove Heights
South St. Paul

Agencies

Federal Highway Administration
U.S. Corps of Engineers
Minnesota Department of Transportation
Minnesota Environmental Quality Board
(through its Technical Representatives Group)
Minnesota Pollution Control Agency
Minnesota Department of Natural Resources
Minnesota State Planning Agency
Minnesota Health Department
Minnesota Pollution Control Agency
Minnesota Energy Agency
Minnesota Department of Agriculture
Minnesota Historical Society
Minnesota Historic Preservation Office
Ramsey County Historical Society
Metropolitan Council
Metropolitan Transit Commission

Further coordination during the drafting of the EIS was provided by the Project Management Team, which consists of representatives of FHWA, MnDOT, and the Metropolitan Council; and the coordinating group, which is made up of appointed representatives of affected communities. In addition, five public meetings were held in the fall of 1980 to discuss preliminary findings. The State Historical Society was also contacted to identify properties meriting analysis.

The following letters have been received as of the date of printing of this EIS.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

IN REPLY REFER TO:

St. Paul Field Office, Ecological Services
538 Federal Building and U.S. Court House
316 North Robert Street
St. Paul, Minnesota 55101

May 11, 1981

Mr. Ghaleb Abdul-Rahman
I-35 Project Manager
Metropolitan Council
300 Metro Square Building
St. Paul, Minnesota 55101

Dear Mr. Abdul-Rahman:

This responds to your request for U.S. Fish and Wildlife Service participation in the I-35E study as a cooperating agency. We will be glad to assist in the scoping process through review of early planning efforts and the provision of technical assistance. The special reports for the I-35E Environmental Impact Statement accompanying your letter have been reviewed and they provide an adequate documentation of fish and wildlife resources within the project area.

Please keep us informed as the study progresses. These comments have been prepared under the authority of and in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et. seq.) and are consistent with the intent of the National Environmental Policy Act of 1969 and Executive Orders 11988 and 11990 of May, 1977.

Sincerely,

Richard F. Berry

Richard F. Berry
Field Office Supervisor

DEPARTMENT OF THE ARMY
ST PAUL DISTRICT, CORPS OF ENGINEERS
1135 U. S POST OFFICE & CUSTOM HOUSE
ST PAUL, MINNESOTA 55101

REPLY TO
ATTENTION OF:
NCSED-ER

28 May 1981

Mr. Lawrence Dallam
Acting I-35E Project Manager
Metropolitan Council
300 Metro Square Building
St. Paul, Minnesota 55101

Dear Mr. Dallam:

We have received your 8 May 1981 request to comment on the preliminary draft environmental statement for I-35E in St. Paul.

Within the limits of time and information available, my staff has reviewed this preliminary draft, and our comments are inclosed. We will make a more thorough review when we receive the official draft statement. It would facilitate our review if you could provide us some of the other special reports: Water Quality, Social and Neighborhood Impacts, Historic Sites, Energy, and Land Use. In addition, we would like to examine the HEC-2 backwater profiles. Since several branches within the District will contribute comments, we would greatly appreciate receiving five to ten additional copies of the official draft. A

Thank you for this opportunity to review the preliminary draft and for consideration of our requests. We look forward to receipt of the official draft environmental statement and to continued close coordination with you.

Sincerely,

Chester G. Hallmark

CHESTER G. HALLMARK
Acting Chief, Engineering Division

1 Incl
As stated

A. Copies of these special studies and additional copies of the official draft will be provided. HEC-2 profiles will be provided.

ST. PAUL DISTRICT, CORPS OF ENGINEERS, COMMENTS ON
PRELIMINARY DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)
I-35E, ST. PAUL

1. Summary - We concur that placement of fill in wetlands adjacent to the Mississippi River, in association with Alternatives B, J, or K, would require a Department of the Army permit. B

2. Section III - The term "cultural" usually refers to historic, architectural, and archaeological resources. Perhaps Section III (C) should be retitled "Social Environment." C

3. Section IV - This document fails to adequately address cultural resources. The proposed project is a major undertaking which could have a significant impact on cultural resources. Cultural resources should be included as an integral part of project planning and should receive extensive coverage within Sections III and IV of this EIS. D

4. Page 66* - The total maximum effect of any 35E corridor in the Mississippi River floodplain plus the development by the city of St. Paul is .6 foot.

a. Any raise in water surface elevation at St. Paul is reflected upstream to Locks and Dam 1 and on the Minnesota River upstream of Chaska.

b. It does not appear that any of the proposed corridors will have a significant effect on the Mississippi River Water Surface Profile for the 100-year flood.

c. This project could significantly affect two of our flood control projects (at Chaska and St. Paul) at floods greater than the 100-year flood. However, no information was presented with regard to the effects of the proposed plan on floods greater than the 100-year flood. E

d. Any increase in stage would reduce the level of protection for the St. Paul project. Therefore, the wording of the sentence regarding the effect on project freeboard should be revised. The level of protection provided should have the required freeboard. (In this case, the reduction in the level of protection provided could be small.) F

5. Page 67* - Before implementation of a plan which would affect the St. Paul project, further coordination between the city of St. Paul, the Minnesota DNR, and the Corps of Engineers may be required. G

*Note: Page numbers do not correspond to published draft.

B. Based on further conversations with the Corps, it was determined that permits would be required for Alternate B under Section 404 (fill in public waters) and Section 10 (alteration to structures within the ordinary high water mark) due to river encroachment and bridge reconstruction. Alternates J and K will not need a 404 permit and are unlikely to require a Section 10 permit, depending on detailed design. Should Alternates B, J or K be selected, coordination with the Corps will be continued throughout design and construction.

C. It has been retitled.

D. Eleven cultural resources have been analyzed since the early draft. Two were added to the 4(f) analysis, and two were added to the Section 106 indirect impacts. The addition of these properties completes the cultural inventory and assessment.

E. Should Alternate B become the preferred alternative, floods in excess of 100-year frequency will be reviewed.

F. Wording has been revised in the published draft. See page 93.

G. Should Alternate B become the preferred alternative, further coordination will be initiated.

Minnesota Pollution Control Agency

May 22, 1981

Ghaleb Abdul-Rahman
Metropolitan Council
300 Metro Square Building
St. Paul, Minnesota 55101

Dear Mr. Abdul-Rahman:

The Minnesota Pollution Control Agency staff has reviewed the series of special studies prepared for the St. Paul link of I-35E.

Since this project is located in a fully developed area, the impacts of this project on water and air resources is masked by the existing impacts created by extensive urbanization. Noise levels will probably increase in the vicinity of the proposed highway. City streets are usually less noisy than major highways.

The following are comments from MPCA staff concerning the studies:

Air Quality

1. No violations of any criteria air pollutant are predicted under any of the eleven alternatives which involve construction of a new roadway.

At some of the receptors, the predicted carbon monoxide will be higher in the year 2000 if no new roadway is constructed.

Future air quality prediction is based upon a computerized dispersion model. It appears that the input parameters and critical receptors used in the model have been selected in an acceptable manner. The Division of Air Quality does not have the capability of doing an independent model verification at this time. Based on past experience with the model results and the reputation of the consulting firms involved, we are confident that the predicted carbon monoxide levels are as accurate and reliable as can be made at this time.

Phone:(612) 296-7293
1935 West County Road B2, Roseville, Minnesota 55113
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2. Fugitive dust emissions during the construction of any of the alternatives discussed is a definite concern of the Air Quality Division. As with any demolition and/or construction project, the potential exists for significant dust and possible asbestos fiber emission problems. Before any contracts are let for this project, the Division of Air Quality will require assurances that APC 6 and APC 17 will be met.

3. The issue of noise pollution was not addressed in this report. As is the case with every freeway in the Metropolitan area, a violation of current state noise standards can be expected if a freeway is constructed. The Division of Air Quality would like to have a noise impact analysis of the various alternatives before the final option is selected. **A**

Water Quality

1. The primary concern with this segment of I-35 is preventing accidental spills from reaching the Mississippi River. The EIS should address feasible methods for spill control, including specific designs, management techniques and an overall spill control plan. **B**

2. Since this segment of the Mississippi River receives a large quantity of urban and highway runoff, the EIS should examine feasible methods for treating this runoff. The probable method would use some type of detension basin. **C**

3. It does not appear that the project will have any appreciable impact on the ground water or hydrology in the area.

If you have any questions, feel free to contact me at any time.

Sincerely,

Douglas A. Hall
Environmental Review Coordinator
Office of Planning & Review

A. A noise report has since been provided. PCA comments are included in the next letter.

B. A new section on spills has been added to this draft. See pages 104 and 105. Upon selection of an alternative, a spills management plan will be prepared.

C. No violations of water quality standards are expected. Upon selection of an alternative, final design will consider treatments such as detention basins.

Minnesota Pollution Control Agency

June 4, 1981

Ghaleb Abdul-Rahman
Metropolitan Council
300 Metro Square Building
St. Paul, Minnesota 55101

Dear Mr. Abdul-Rahman:

Mike Costello of Barton-Aschman provided this Agency with a copy of the noise study for the St. Paul link of I-35E. Agency staff found the document well prepared and consistent with our policies and procedures.

Both state and federal guidelines were examined in the noise study with respect to each alternative. This Agency would support an effort by the Minnesota Department of Transportation to choose an alternative with the appropriate mitigative measures that would meet state noise standards.

Sincerely,

Douglas A. Hall
Environmental Review Coordinator
Office of Planning & Review

cc: Dave Kelso

Phone: 296-7293
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United States Department of the Interior

HERITAGE CONSERVATION AND RECREATION SERVICE
LAKE CENTRAL REGION
ANN ARBOR, MICHIGAN 48107

IN REPLY REFER TO:
1202-01 MN

May 15, 1981

Mr. Ghaleb Abdul-Rahman
Metropolitan Council of the Twin Cities Area
300 Metro Square Building
St. Paul, Minnesota 55101

Dear Mr. Abdul-Rahman:

This is in response to your letter of April 14 requesting our participation as a cooperating agency in the preparation of environmental documents for the St. Paul link of the I-35E project.

We have reviewed the material which you have provided us and we urge that the James J. Hill House property be included in the Section 4(f) documentation. The reason given in the Williams/O'Brien Associates' report for its non-inclusion is that the property was listed on the National Register of Historic Places after the Minnesota Department of Transportation acquired it. As the James J. Hill House property was listed on the National Register as a National Historic Landmark in 1961, the above reasoning is in error. We believe that more consideration needs to be given to the Hill House property and to alternatives to the destruction of parts of the Hill estate.

A

It is noted on page 200 of the Section 4(f) special study report that the proposed Warner Road Overlook site currently is in private ownership (its proposed use is as a highway rest area with parking, a detached bicycle and pedestrian path, and access to Lambert's Landing, a site where early settlers arrived by steamboat). Please note that the property would not come under Section 4(f) of the Department of Transportation Act unless it were in public ownership and (1) its recreation facilities were in existence or (2) it was receiving outdoor recreation use informally by the general public.

B

Concerning your invitation for our agency to become a "cooperating agency" for the I-35E project, we wish to decline this responsibility. We do know that, as the Minnesota Historical Society has appropriate comments concerning additional properties to be considered, the Society may be very helpful in formulating alternative proposals.

A. Although the James J. Hill house was designated a National Historic Landmark in 1961, we can find no boundary description of this landmark that dates before 1977. The May 5, 1977 edition of the Federal Register indicated that there was no specific boundary established prior to 1977. We also note that all references to this landmark from 1961 to the early 1970s are specific in their listing of the James J. Hill house rather than the James J. Hill mansion, estate, or property. Without an official boundary description that predates the acquisition by MnDOT, retroactive review under Section 4(f) is not deemed necessary.

The site is included in the Historic Hill District for which impacts have been identified on pages 215-218 of this EIS. The State Historic Preservation office has participated in the above discussion and found it to be consistent with their own information on the subject. It appears that adequate protection for this important historic resource will be afforded under the Section 106 review procedures required by the National Historic Preservation Act of 1966. It is FHWA's position that Section 4(f) does not apply to this property.

B. FHWA has determined that this site is not subject to 4(f) review for the reasons stated in the comment.

Thank you for the opportunity to comment on the special study reports. We hope to continue to assist in the review of the I-35E project, for which we have concerns for the historical and recreational resources of the project area. Please keep us informed.

These comments are provided as technical assistance and do not satisfy our obligation under the National Environmental Policy Act or the Department of Transportation Act with respect to any environmental impact statement or Section 4(f) statement which may be prepared.

Sincerely,

Raymond Essell

Raymond Essell, Acting Chief
Division of Planning Assistance

MINNESOTA HISTORICAL SOCIETY
FOUNDED IN 1849
690 Cedar Street, St. Paul, Minnesota 55101 • (612) 296-6126

3 June 1981

Mr. Ghaleb Abdul-Rahman
Metropolitan Council
300 Metro Square Building
St. Paul, MN 55101

Dear Mr. Abdul-Rahman:

RE: Review of the Historic Property Impact Section of the Draft I-35E Report.

MHS Referral File Number: I 203

Thank you for the opportunity to review and comment on the above project. It has been reviewed pursuant to responsibilities given the State Historic Preservation Officer by the National Historic Preservation Act of 1966 and the Procedures of the National Advisory Council on Historic Preservation (36CFR800).

Our review of the historic properties section of the draft I-35E report reveals that there are two major areas of concern. Our concern involves the impact on the James J. Hill property, and the treatment of the archaeologically sensitive areas that may be affected by the proposed alternatives.

With regard to the impact on the back lots of the James J. Hill property, we would like to emphasize that the Pleasant Avenue alternative would involve extensive direct impacts on the massive retaining wall and archaeological features that are associated with the National Landmark property of the James J. Hill estate. Because the site was designated a National Historic Landmark in 1961, we believe the necessity for a 4f should be further clarified. A

It is our opinion that the category of not likely eligible archaeological resources listed on page 15 of the Special Study Historic Sites Assessment Report for the Pleasant Avenue Corridor be included under sites of local interest that may be directly affected on Table 28. This would then be consistent with the listing of sites of local interest (archaeological sites numbered 3-6) that may be impacted by the Shepard Road corridor.

In this same vein, we believe that the railyards and Fountain Cave should be listed on Table 28 under sites of local interest under the Shepard Road alternative. We feel that they should be identified on the table because they are sites of possible archaeological significance similar to those presently listed. Table 28 would then be more consistent, even though B

A. It is FHWA's position that Section 4(f) does not apply to this property. For a further discussion of the status of this property, please see the response to the H.C.R.S. letter on page 273.

B. These points are well taken, and will be included in the Final EIS.

the properties are addressed in the body of the report.

Although we realize that proposed mitigation plans are tentative, we would like to offer a preliminary comment on alternatives for the archaeological properties (NLEG) that have not yet been extensively assessed. On page 213 of the draft EIS, it is mentioned that a monitoring program should be undertaken at the location of the chapel site. We recommend that all of the "not likely eligible" properties (not just the chapel) be included because there is a possibility of unknown archaeological features in most all of the archaeologically sensitive areas that were mentioned in the report. Although we are aware that specific mitigation plans for archaeological properties will be discussed in greater detail further along in the planning process, we would prefer that the statement regarding possible mitigation would include a program of testing and/or monitoring either before or during construction. This would provide a more accurate statement of the possible mitigation that will be discussed in the future. C

Beyond those items mentioned above, we concur with the findings of the report and appreciate the attention your office has given to cultural resources in your planning process.

Sincerely,

Dennis A. Gimmestad

for Russell W. Fridley
State Historic Preservation Officer

RWF/sl

cc: C. P. Kachelmyer
Department of Transportation
604 Transportation Building

Daniel Lutenegger
Barton-Aschman Associates, Inc.
1610 South Sixth Street
Minneapolis, MN 55415

C. This point will also be included in the Final EIS.

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
COMMANDER (obr)
SECOND COAST GUARD DISTRICT
1430 OLIVE STREET
ST. LOUIS, MO 63103

Tel. 314-425-4607
FTS 279-4607

16590
22 April 1981

Mr. Ghaleb Abdul-Rahman
Metropolitan Council of the
Twin Cities Area
300 Metro Square Building
St. Paul, MN 55101

Re: I-35E Project, St. Paul, Minnesota

Dear Mr. Abdul-Rahman:

Thank you for furnishing the reports of special studies for the referenced project.

We recognize that this project may have impact on existing bridges in the St. Paul area. Accordingly, we accept your invitation to be a cooperating agency. Your attention to keeping us informed of matters under our jurisdiction will be appreciated.

Sincerely,

S. W. THOROUGHMAN
Chief, Bridge Branch
Second Coast Guard District
By direction of the District Commander

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
Commander (obr)
Second Coast Guard Dist.
1430 Olive Street
St. Louis, MO 63103
Tel. (314) 425-4607
FTS 279-4607

16590/843.2 UMR

JUN 4 1981

Mr. Lawrence Dallam
Metropolitan Council of the Twin Cities Area
300 Metro Square Building
St. Paul, MN 55101

Re: I-35E Project, St. Paul, Minnesota; (draft) Environmental Impact Statemen.

Dear Mr. Dallam:

Thank you for your letter of 8 May 1981 forwarding a copy of the (draft) Draft Environmental Impact Statement concerning the referenced project.

Our review of the (draft) Draft Environmental Impact Statement indicates that the Shepard Road Alternative (Alternative B) would effect several bridges eligible for inclusion on the National Register of Historic Places making them protected properties under Section 4(f) of the Department of Transportation Act. Any plans to modify these structures would require prior approval and satisfactory completion of the Section 4(f) process before work begins. We would point out that the General Bridge Act of 1946 requires the submission and prior approval by the Commandant, U.S. Coast Guard of the plans for the alteration of any bridge over a navigable waterway of the United States. A separate application would be required for each bridge. Each application must be supported by sufficient information to permit a thorough assessment of any alteration to these bridges and their immediate approaches including the effects which might occur to the environment. Applications for bridge permits should be addressed to Commander, Second Coast Guard District, 1430 Olive Street, St. Louis, Missouri 63103, Atten: Bridge Branch.

The opportunity to comment on this proposed project is appreciated. Should you have questions contact Mr. John Accornero of this office at the above telephone number.

Sincerely,

M. J. HARTMAN
Captain, U. S. Coast Guard
Chief, Operations Division
By direction of the District Commander

X. INDEX

	Page
Access	21,144,147
Aesthetics	42,193
Air Quality (existing)	51
Air Quality (impacts)	120
Alternatives Description	26
Aquatic Habitat	53
Archeological Sites	212
Arterial Capacity	22
Associated Development	156
Bald Eagle	35
Bicycling	139
Butternut Avenue Historic District	248
Caves	77
C & G Lift Bridge	249
City Needs and Policies	8
Climate	43
Comments	266
Common Section	33
Community Services	61
Cooperating Agencies	iii,193
Coordination	254,267
Corridor Selection	25
Costs	37,42,175
Crosby Farm Park	228
Desire Lines	15
Development	156,177
Direct Connection	31
Direct Impact (definition)	71
Downtown	57
Dust	119
East CBD Bypass (definition)	31
Economic Development	22,41,156
Emmert, Fredrick (residence)	212
Employment	57,58,175
Encroachment (significance)	96
Energy	187
Erosion	79
Ethnic Character	61
Existing Travel Patterns	9
Federal Goals	7
Fiscal Impact	179
Floodplain (impacts)	39,92
Floodplain (hazard evaluation)	91
Floodplain (values)	94
Foundations	77
Fountain Cave	212
G.T.A. Number 1 Grain Terminal	225
Gaultier Chapel	243
Geologic Impacts	77
Geology (existing)	43
German Presbyterian Church	235
Gilbert, Cass - Church	235
Goods Movement	41,145
Great River Road	68
Groundwater	44,84,104
Habitat	53,109
Higgins Eye Mussel	114
High Occupancy Vehicles	188
Hiking	139
Hill District	216
Hill, James J. - Residence	216
Historic Properties	42,211-254
History of Project	1
Horn, Henry - Residence	244
How - Residence	221
Indirect Connection	31
Indirect Impact (definition)	71
Irvine Park Historic District	244
Issues and Concerns	267
Joint Development	159
Land Use (existing)	57
Land Use (plans)	67
Land Use (compatibility)	155
Level of Service	40,143
Light Rail	190
Location	1
Masonic Temple	211
Metropolitan Goals	8
Minnesota Boat Club Boathouse	225
Mississippi River Corridor Plan	68
Modal Interrelationships	23,146
Myrick, Nathan - Residence	222
Need	1
No-Build Definition	35
Noise Impacts	39,127
Northern Pacific Freight House	250

	Page
Panama Flats	222
Park Land	227
Parkway Definition	26
Peregrine Falcon	113
Phalen's Cabin	212
Population	58
Property Value	168
Public Services	169
Purpose	7
Quinlan Care Home	218
Racial Character	61
Recreation Properties	227
Regional Accessibility	40,147
Relocation	42,165
Right-of-Way	165
River Use	91
Robert Street Bridge	239
Runoff	83,101
Safety	144
St. Paul, Chapel of	243
St. Paul Masonic Temple	211
Scoping Process	261
Section 106	215
Selby Avenue Tunnel	216
Sewer System	45,83
Short Line	31
Significant Impacts	39
Slope Stability	77
Smith Avenue High Bridge	244
Soils	43
Special Studies (list)	iii
Spills	104
State Goals	8
System Linkage	9
Taxes	179
Termini	1
Terrestrial Habitat	53
Threatened and Endangered Species	113
Traffic Congestion	143
Traffic Volumes	9,137
Transportation Plan Consistency	8,147
Transportation System Management	36,137,190
Travel Patterns	9,17,18
Travel Time	140
Trip Forecasts	19
Truck Routes	13
Union Depot	238
Vegetation	53
Vehicle Miles Traveled	142
Vibration	183
View from the Road	193
View of the Road	193
Wabasha Street Bridge	223
Walking	139
Warner Road Overlook	228
Water Quality (existing)	44
Water Quality (predicted)	101
Watersheds	44
Wetlands (type)	111
Wetlands (impacts)	112
Wetlands (significance)	112
Wetlands (mitigation)	113
Wildlife	54
Wright-Prendergast - Residence	244

APPENDIX A - ALTERNATIVE LAYOUTS

Presented on the following pages are the layouts for the alternatives. Since the differences between alternatives is frequently small, the twelve alternatives have been grouped into five groups:

Pleasant Avenue Freeways (A, A')
Shepard Road Freeway (B)
Pleasant Avenue Parkways (C, D, E, F, G, H)
No-Build (I)
Pleasant Avenue Parkways with East CBD Bypass (J, K)

TRUCKS USE SHORT LINE.

FREEWAY IN PLEASANT AVE.

FIGURE A.1

ALIGNMENT FOR FREEWAY IN PLEASANT AVENUE:
ALTERNATES A (6 LANE) AND A¹ (4 LANE)

1000 0 2000 4000 ft

North

135E

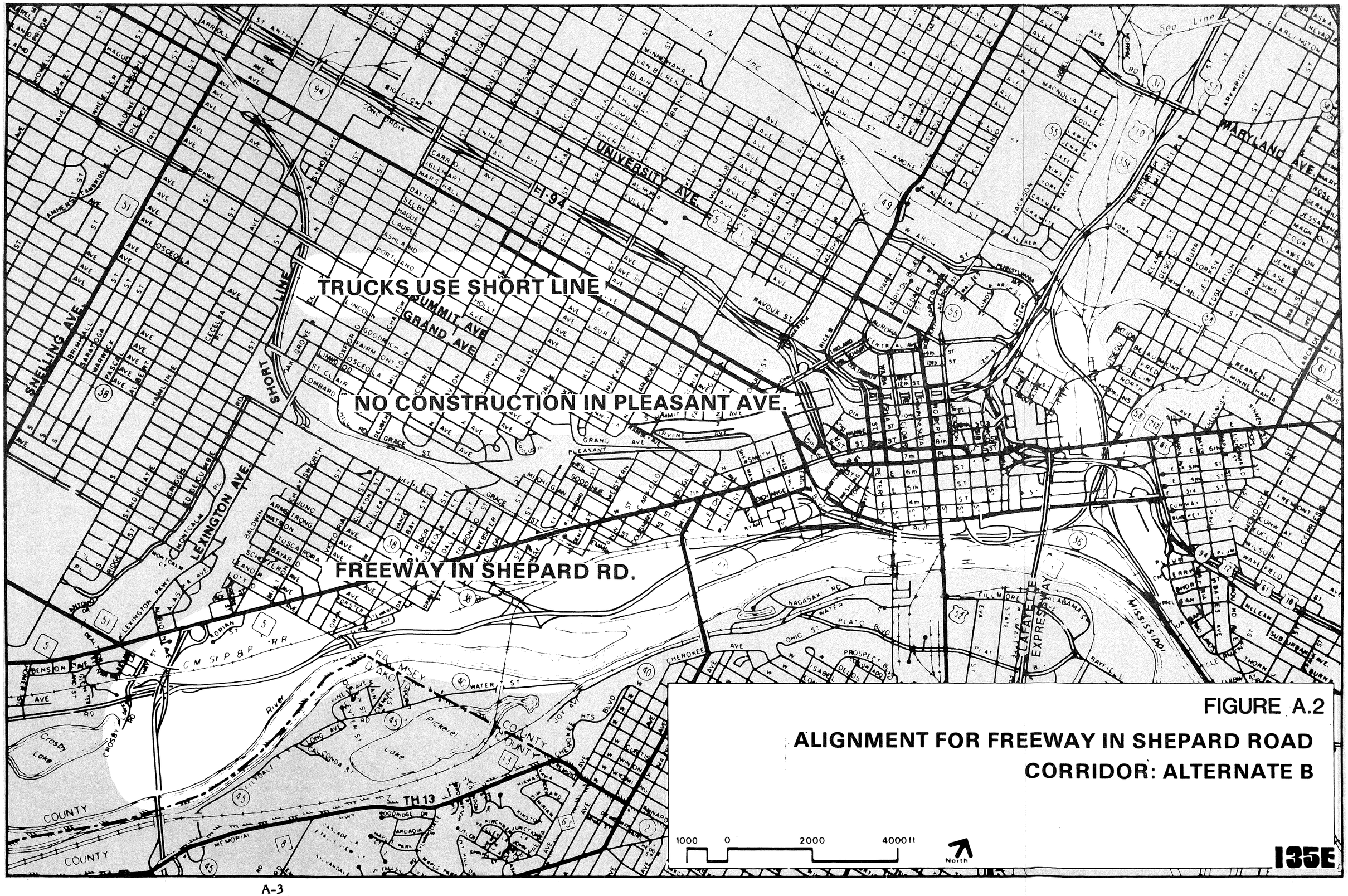


FIGURE A.2

ALIGNMENT FOR FREEWAY IN SHEPARD ROAD CORRIDOR: ALTERNATE B

135E

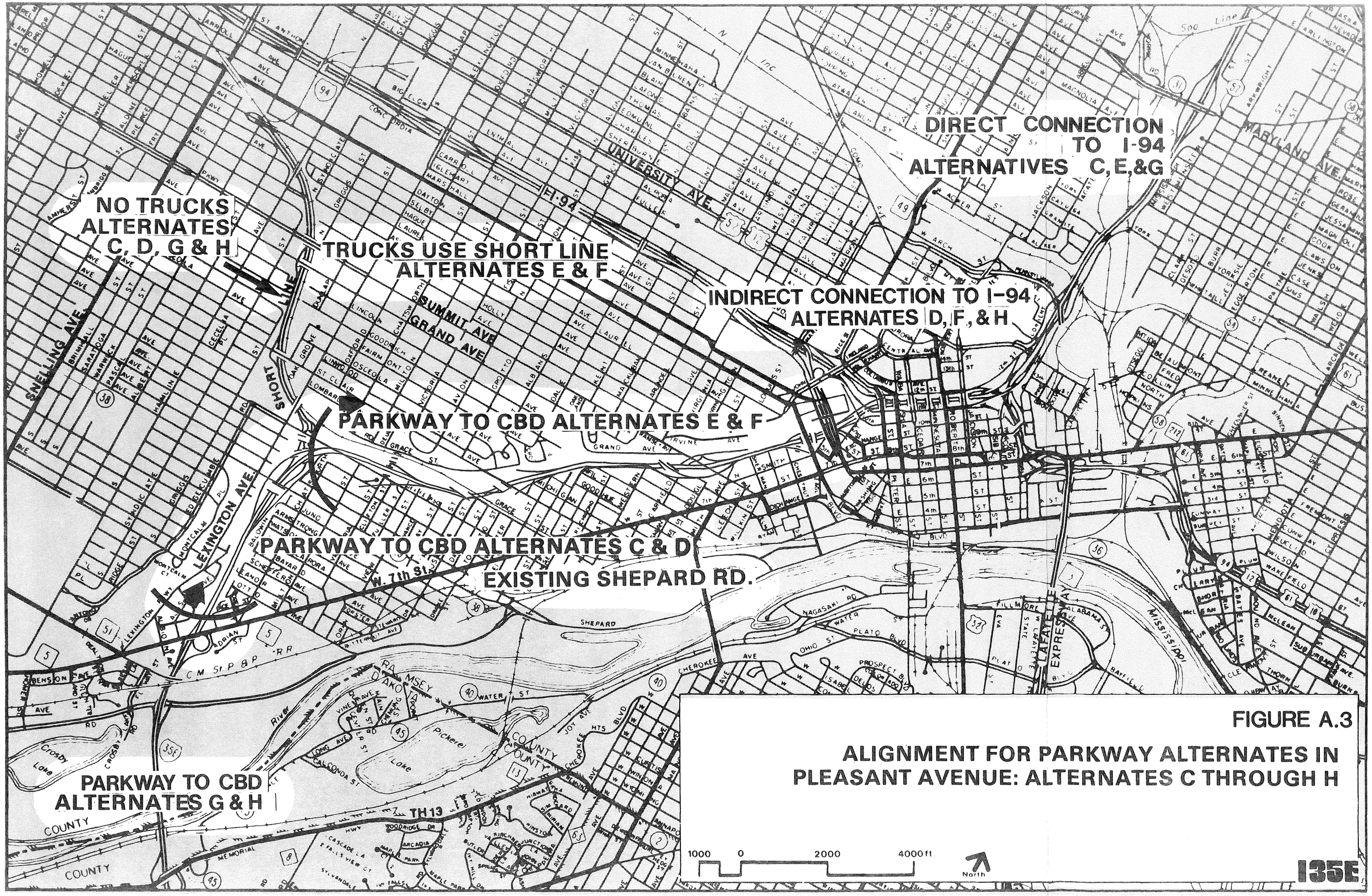


FIGURE A.3

ALIGNMENT FOR PARKWAY ALTERNATES IN PLEASANT AVENUE: ALTERNATES C THROUGH H

135E

TRUCKS USE SHORT LINE

NO CONSTRUCTION IN PLEASENT AVE.

EXISTING SHEPARD RD.

RESIDENTIAL
6 UNITS PER ACRE
12 UNITS PER ACRE
20 UNITS PER ACRE
70 UNITS PER ACRE

COMMERCIAL
PUBLIC OPEN SPACE

FIGURE A.4

NO BUILD ALTERNATE LAND USE PLAN

135E

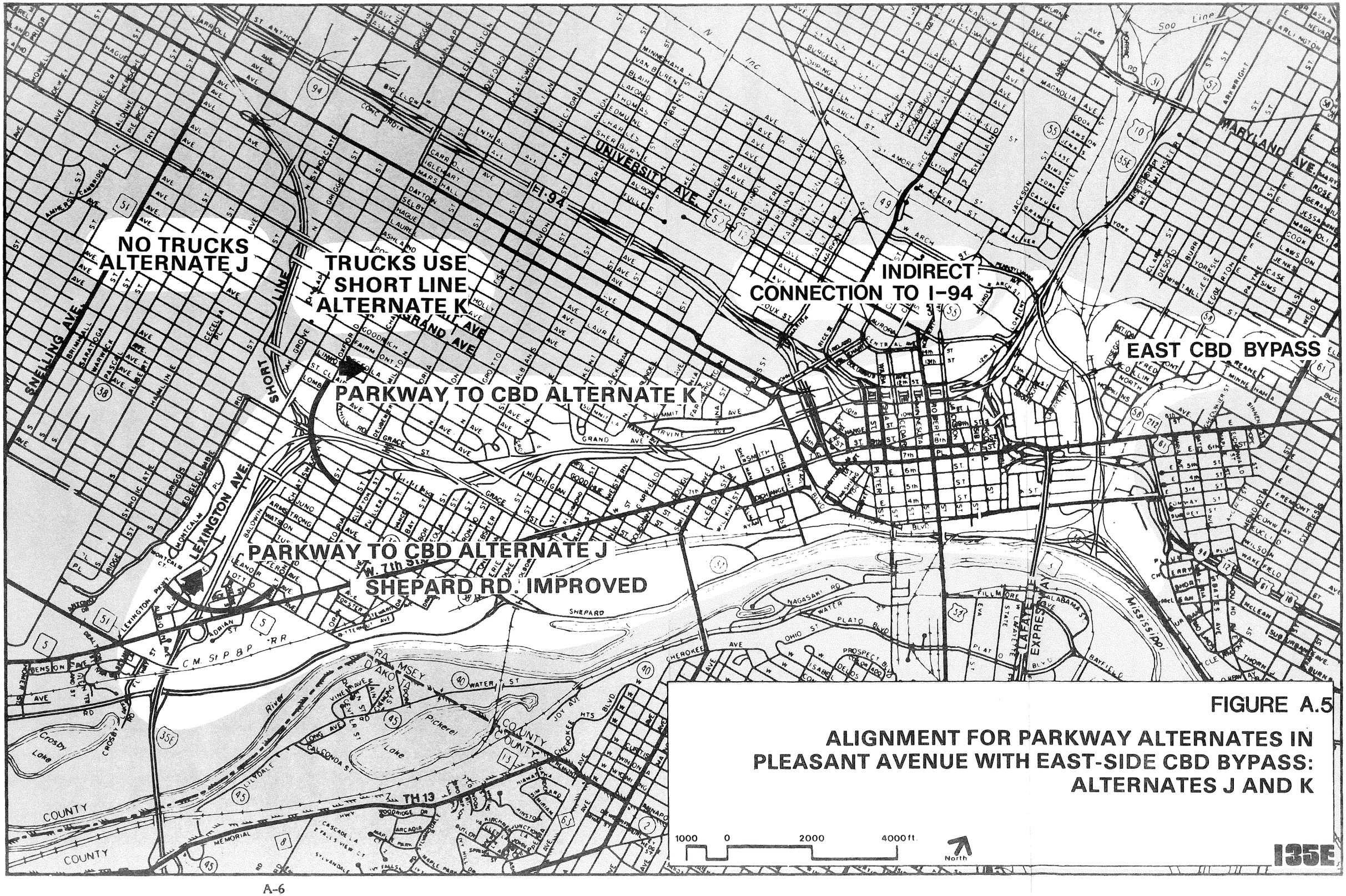


FIGURE A.5

ALIGNMENT FOR PARKWAY ALTERNATES IN PLEASANT AVENUE WITH EAST-SIDE CBD BYPASS: ALTERNATES J AND K

APPENDIX B - PREDICTED NOISE LEVELS

Presented in the following tables are the predicted noise levels (L_{10} and L_{50}*) (Daytime, Nighttime) by receptor for the year 2000. The location of each receptor is identified in Figure 20 of the main text. Also presented for reference are applicable design criteria and Minnesota Pollution Control Agency standards as well as the number of activity centers represented by each receptor. Similar numbers predicted for the year 1990 are available for review in the "Preliminary Noise Report" - Appendix D.

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*L_{10} and L_{50} are the sound levels, expressed in dBA, which are exceeded ten percent and fifty percent of the time respectively, during a one-hour survey.

EXISTING AND FUTURE EXTERIOR NOISE LEVELS (L_{10} IN dBA)
DAYTIME, YEAR 2000

Corridor & Receptor Area	Receptors[1]	Distance[2] (ft)	Applicable Noise Level Criteria FHWA	MPCA	Measured Noise Level	Future Noise Levels by Project Alternative A	A1	B	C	D	E	F	G	H	I	J	K
Pleasant Ave																	
2	18 SF	150	70	65	56	75	74	-	68	68	73	73	68	68	-	69	74
2A	15 SF	250	70	65	-	73	72	-	66	66	71	71	66	66	-	67	72
3	29 SF, 1 MF, 1 PG	150	70	65	52	75	74	-	68	69	73	74	68	69	-	69	74
3A	12 SF	300	70	65	-	72	71	-	65	66	70	71	65	66	-	66	71
6	8 SF	425	70	65	62	69	68	-	63	62	63	62	63	62	-	62	62
6A	22 SF	450	70	65	-	69	68	-	63	62	63	62	63	62	-	62	62
6B	43 SF, 2 C	250	70	65	-	71	70	-	65	64	65	64	65	64	-	64	64
6C	90 SF, 1 C, 1 S	250	70	65	-	71	70	-	65	64	65	64	65	64	-	64	64
7	1 PK	550	70	70	61	68	67	-	63	62	63	62	63	62	-	62	62
7A	14 SF	400	70	65	-	69	68	-	64	63	64	63	64	63	-	63	63
7B	39 SF, 1 S	1000	70	65	-	65	64	-	60	59	60	59	60	59	-	59	59
7C	17 SF	300	70	65	-	70	69	-	65	64	65	64	65	64	-	64	64
8	11 SF	750	70	65	60	68	67	-	62	61	62	61	62	61	-	61	61
8A	10 SF, 1 PG	500	70	65	-	70	69	-	64	63	64	63	64	63	-	63	63
8B	2 SF, 3 C	400	70	65	-	71	70	-	65	64	65	64	65	64	-	64	64
9	30 SF, 11 MF, 2 H	300	70	65	59	71	70	-	65	64	65	64	65	64	-	64	64
10	1 H	200	70	65	60	76	75	-	69	69	69	69	69	69	-	69	69
17	1 H	200	70	65	64	73	72	-	68	67	68	67	68	67	-	66	66
Shepard Rd.																	
1	1 PK	200	70	70	68	71	71	75	73	73	73	73	73	73	73	74	74
11	17 SF	170	70	65	67	71	71	75	73	73	73	73	73	73	73	74	74
12	15 SF	1430	70	65	64	60	60	64	62	62	62	62	62	62	59	63	63
13	20 SF	140	70	65	57	66	66	76	68	67	67	67	67	67	67	68	68
14	22 SF	1950	70	65	56	-	-	61	-	-	-	-	-	-	-	60	60
15	1 PK	175	70	70	68	59	59	71	59	59	59	59	59	59	63	63	63

(continued)

EXISTING AND FUTURE EXTERIOR NOISE LEVELS (L_{10} IN dBA)
DAYTIME, YEAR 2000

Corridor & Receptor Area	Receptors[1]	Distance[2] (ft)	Applicable Noise Level Criteria FHWA	MPCA	Measured Noise Level	Future Noise Levels by Project Alternative A	A1	B	C	D	E	F	G	H	I	J	K
Short Line																	
4	40 SF, 2 MF	150	70	65	63	74	74	72	68	67	75	74	68	67	72	68	74
5	32 SF, 3 MF	213	70	65	64	72	72	69	65	65	72	72	65	65	69	65	71
16	14 SF	200	70	65	67	72	72	69	65	65	72	72	65	65	69	65	71
Common Area																	
18	15 MF	220	70	65	70	73	73	73	73	73	73	73	73	73	73	74	74
19	38 SF, 2 MF	200	70	65	68	73	73	73	73	73	73	73	73	73	73	74	74
20	1 H	500	70	65	67	69	69	69	69	69	69	69	69	69	69	70	70
21	30 SF	400	70	65	-	70	70	70	70	70	70	70	70	70	70	71	71

(1) Approximate number and type of receptor; type code: SF = single family structure, MF = multiple dwelling unit structures; c = commercial, or office, PK = park, PG = playground, S = school, H = hospital (or nursing home).

(2) Distance refers to the approximate distance between the receptor area and the roadway centerline, in feet.

(3) Measured noise levels were determined during June 1979 at all receptors except common area, where measurements were conducted in October, 1979.

EXISTING AND FUTURE EXTERIOR NOISE LEVELS (L_{50} IN dBA)
DAYTIME, YEAR 2000

Corridor & Receptor Area	Receptors[1]	Distance[2] (ft)	Applicable Noise Level Criteria FHWA	MPCA	Measured Noise Level June, 1979	Future Noise Levels by Project Alternative A	A1	B	C	D	E	F	G	H	I	J	K
Pleasant Ave																	
2	18 SF	150	-	60	49	72	71	-	67	67	69	70	67	67	-	68	71
2A	15 SF	250	-	60	-	70	69	-	65	65	67	68	65	65	-	66	69
3	29 SF, 1 MF, 1 PG	150	-	60	47	72	71	-	67	67	70	70	67	67	-	68	71
3A	12 SF	300	-	60	-	69	68	-	64	64	67	67	64	64	-	65	68
6	8 SF	425	-	60	55	66	65	-	61	60	61	60	61	60	-	59	59
6A	22 SF	450	-	60	-	66	65	-	61	60	61	60	61	60	-	59	59
6B	43 SF, 2 C	250	-	60	-	68	67	-	63	62	63	62	63	62	-	61	61
6C	90 SF, 1 C, 1 S	250	-	60	-	68	67	-	63	62	63	62	63	62	-	61	61
7	1 PK	550	-	65	53	66	65	-	63	60	63	60	63	60	-	60	60
7A	14 SF	400	-	60	-	67	66	-	64	61	64	61	64	61	-	61	61
7B	39 SF, 1 S	1,000	-	60	-	63	62	-	60	57	60	57	60	57	-	57	57
7C	17 SF	300	-	60	-	68	67	-	65	62	65	62	65	62	-	62	62
8	11 SF	750	-	60	55	66	65	-	61	60	61	60	61	60	-	59	59
8A	10 SF, 1 PG	500	-	60	-	68	67	-	63	62	63	62	63	62	-	61	61
8B	2 SF, 3 C	400	-	60	-	69	68	-	64	63	64	63	64	63	-	62	62
9	30 SF, 11 MF, 2 H	300	-	60	53	69	68	-	64	63	64	63	64	63	-	62	62
10	1 H	200	-	60	55	73	72	-	68	67	68	67	68	67	-	67	67
17	1 H	200	-	60	60	71	70	-	66	64	66	64	66	64	-	63	63
Shepard Road																	
1	1 PK	200	-	65	60	65	65	72	69	69	69	69	69	69	69	70	70
11	17 SF	170	-	60	61	65	65	72	69	69	69	69	69	69	69	70	70
12	15 SF	1,430	-	60	56	58	58	63	61	61	61	61	61	61	58	62	62
13	20 SF	140	-	60	54	59	59	73	63	63	63	63	63	63	63	64	64
14	22 SF	1,950	-	60	50	-	-	57	-	-	-	-	-	-	-	58	58
15	1 PK	175	-	65	63	54	54	68	56	56	56	56	56	56	59	59	59

(continued)

EXISTING AND FUTURE EXTERIOR NOISE LEVELS (L_{50} IN dBA)
DAYTIME, YEAR 2000

Corridor & Receptor Area	Receptors[1]	Distance[2] (ft)	Applicable Noise Level Criteria FHWA	MPCA	Measured Noise Level June, 1979	Future Noise Levels by Project Alternative A	A1	B	C	D	E	F	G	H	I	J	K
Short Line																	
4	40 SF, 2 MF	150	-	60	51	70	70	65	66	65	71	70	66	65	65	66	70
5	32 SF, 3 MF	213	-	60	60	68	68	64	64	64	69	69	64	64	65	63	68
16	14 SF	200	-	60	61	68	68	64	64	64	69	69	64	64	65	63	68
Common Area																	
18	15 MF	220	-	60	66	71	71	71	71	71	71	71	71	71	71	72	72
19	38 SF, 2 MF	200	-	60	65	71	71	71	71	71	71	71	71	71	71	72	72
20	1 H	500	-	60	64	67	67	67	67	67	67	67	67	67	67	68	68
21	30 SF	400	-	60	-	68	68	68	68	68	68	68	68	68	68	69	69

(1) Approximate number and type of receptor; type code: SF = single family structure, MF = multiple dwelling unit structures; c = commercial, or office, PK = park, PG = playground, S = school, H = hospital (or nursing home).

(2) Distance refers to the approximate distance between the receptor area and the roadway centerline, in feet.

(3) Measured noise levels were determined during June 1979 at all receptors except common area, where measurements were conducted in October, 1979.

EXISTING AND FUTURE EXTERIOR NOISE LEVELS (L_{10} IN dBA)
NIGHTTIME, YEAR 2000

Corridor & Receptor Area	Receptors[1]	Distance[2] (ft)	Applicable Noise Level Criteria FHWA	MPCA	Measured Noise Level	Future Noise Levels by Project Alternative A	A1	B	C	D	E	F	G	H	I	J	K
Pleasant Ave																	
2	18 SF	150	-	55	49	74	73	-	67	67	73	74	67	67	-	68	74
2A	15 SF	250	-	55	-	72	71	-	65	65	71	72	65	65	-	66	72
3	29 SF, 1 MF, 1 PG	150	-	55	-	74	73	-	67	68	73	74	67	68	-	68	74
3A	12 SF	300	-	55	-	71	70	-	64	65	70	71	64	65	-	65	71
6	8 SF	425	-	55	-	68	67	-	63	61	63	61	63	61	-	61	61
6A	22 SF	450	-	55	-	68	67	-	63	61	63	61	63	61	-	61	61
6B	43 SF, 2 C	250	-	55	-	70	69	-	65	63	65	63	65	63	-	63	63
6C	90 SF, 1 C, 1 S	250	-	55	-	70	69	-	65	63	65	63	65	63	-	63	63
7	1 PK	550	-	70	-	67	66	-	62	60	62	60	62	60	-	60	60
7A	14 SF	400	-	55	-	68	67	-	63	61	63	61	63	61	-	61	61
7B	39 SF, 1 S	1000	-	55	-	64	63	-	59	57	59	57	59	57	-	57	57
7C	17 SF	300	-	55	-	69	68	-	64	62	64	62	64	62	-	62	62
8	11 SF	750	-	55	51	67	66	-	61	60	61	60	61	60	-	60	60
8A	10 SF, 1 PG	500	-	55	-	69	68	-	63	62	63	62	63	62	-	62	62
8B	2 SF, 3 C	400	-	55	-	70	69	-	64	63	64	63	64	63	-	63	63
9	30 SF, 11 MF, 2 H	300	-	55	54	70	69	-	64	63	64	63	64	63	-	63	63
10	1 H	200	-	55	-	75	74	-	68	68	68	68	68	68	-	68	68
17	1 H	200	-	55	-	73	72	-	67	65	67	65	67	65	-	64	64
Shepard Rd.																	
1	1 PK	120	-	70	-	71	71	72	71	71	71	71	71	71	72	72	72
11	17 SF	120	-	55	-	71	71	72	71	71	71	71	71	71	72	72	72
12	15 SF	1430	-	55	-	59	59	61	59	59	59	59	59	59	60	60	60
13	20 SF	140	-	55	65	65	65	74	65	65	65	65	65	65	66	66	66
14	22 SF	1950	-	55	-	-	-	60	-	-	-	-	-	-	-	59	59
15	1 PK	175	-	70	-	58	58	70	58	58	58	58	58	58	62	62	62

(continued)

EXISTING AND FUTURE EXTERIOR NOISE LEVELS (L_{10} IN dBA)
NIGHTTIME, YEAR 2000

Corridor & Receptor Area	Receptors[1]	Distance[2] (ft)	Applicable Noise Level Criteria FHWA	MPCA	Measured Noise Level	Future Noise Levels by Project Alternative A	A1	B	C	D	E	F	G	H	I	J	K
Short Line																	
4	40 SF, 2 MF	150	-	55	-	73	73	70	67	66	73	72	67	66	71	67	72
5	32 SF, 3 MF	213	-	55	61	70	70	69	64	64	70	70	64	64	69	64	70
16	14 SF	200	-	55	-	70	70	69	64	64	70	70	64	64	69	64	70
Common Area																	
18	15 MF	220	-	55	-	72	72	72	72	72	72	72	72	72	72	72	72
19	38 SF, 2 MF	200	-	55	-	72	72	72	72	72	72	72	72	72	72	72	72
20	1 H	500	-	55	-	68	68	68	68	68	68	68	68	68	68	68	68
21	30 SF	400	-	55	-	69	69	69	69	69	69	69	69	69	69	69	69

(1) Approximate number and type of receptor; type code: SF = single family structure, MF = multiple dwelling unit structures; c = commercial, or office, PK = park, PG = playground, S = school, H = hospital (or nursing home).

(2) Distance refers to the approximate distance between the receptor area and the roadway centerline, in feet.

(3) Measured noise levels were determined during June 1979 at all receptors except common area, where measurements were conducted in October, 1979.

EXISTING AND FUTURE EXTERIOR NOISE LEVELS (L_{50} IN dBA)
NIGHTTIME, YEAR 2000

Corridor & Receptor Area	Receptors[1]	Distance[2] (ft)	Applicable Noise Level Criteria FHWA	MPCA	Measured Noise Level June, 1979	Future Noise Levels by Project Alternative A	A1	B	C	D	E	F	G	H	I	J	K
Pleasant Ave																	
2	18 SF	150	-	50	45	71	70	-	66	66	70	70	66	66	-	67	70
2A	15 SF	250	-	50	-	69	68	-	64	64	68	68	64	64	-	65	65
3	29 SF, 1 MF, 1 PG	150	-	50	-	71	70	-	66	66	70	70	66	66	-	67	70
3A	12 SF	300	-	50	-	68	67	-	63	63	67	67	63	63	-	64	67
6	8 SF	425	-	50	-	65	64	-	62	59	62	59	62	59	-	59	59
6A	22 SF	450	-	50	-	65	64	-	62	59	62	59	62	59	-	59	59
6B	43 SF, 2 C	250	-	50	-	67	66	-	64	61	64	61	64	61	-	61	61
6C	90 SF, 1 C, 1 S	250	-	50	-	67	66	-	64	61	64	61	64	61	-	61	61
7	1 PK	550	-	65	-	65	64	-	61	59	61	59	61	59	-	59	59
7A	14 SF	400	-	50	-	66	65	-	62	60	62	60	62	60	-	60	60
7B	39 SF, 1 S	1,000	-	50	-	62	61	-	58	56	58	56	58	56	-	56	56
7C	17 SF	300	-	50	-	67	66	-	63	61	63	61	63	61	-	61	61
8	11 SF	750	-	50	45	65	64	-	60	59	60	59	60	59	-	58	58
8A	10 SF, 1 PG	500	-	50	-	67	66	-	62	61	62	61	62	61	-	60	60
8B	2 SF, 3 C	400	-	50	-	68	67	-	63	62	63	62	63	62	-	61	61
9	30 SF, 11 MF, 2 H	300	-	50	-	68	67	-	63	62	63	62	63	62	-	61	61
10	1 H	200	-	50	51	72	71	-	67	66	67	66	67	66	-	66	66
17	1 H	200	-	50	-	69	68	-	65	63	65	63	65	63	-	61	61
Shepard Road																	
1	1 PK	120	-	65	-	64	64	69	64	65	64	65	64	65	68	66	66
11	17 SF	120	-	50	-	64	64	69	64	65	64	65	64	65	68	66	66
12	15 SF	1,430	-	50	-	57	57	60	57	57	57	57	57	57	59	58	58
13	20 SF	140	-	50	55	57	57	70	57	58	57	58	57	58	61	60	60
14	22 SF	1,950	-	50	50	-	-	56	-	-	-	-	-	-	-	57	57
15	1 PK	175	-	65	-	53	53	67	55	55	55	55	55	55	58	58	58

(continued)

EXISTING AND FUTURE EXTERIOR NOISE LEVELS (L_{50} IN dBA)
NIGHTTIME, YEAR 2000

Corridor & Receptor Area	Receptors[1]	Distance[2] (ft)	Applicable Noise Level Criteria FHWA	MPCA	Measured Noise Level June, 1979	Future Noise Levels by Project Alternative A	A1	B	C	D	E	F	G	H	I	J	K
Short Line																	
4	40 SF, 2 MF	150	-	50	-	67	67	62	65	64	67	66	65	64	63	65	68
5	32 SF, 3 MF	213	-	50	50	66	66	62	63	63	65	65	63	63	63	62	65
16	14 SF	200	-	50	-	66	66	62	63	63	65	65	63	63	63	62	65
Common Area																	
18	15 MF	220	-	50	-	70	70	70	70	70	70	70	70	70	70	70	70
19	38 SF, 2 MF	200	-	50	-	70	70	70	70	70	70	70	70	70	70	70	70
20	1 H	500	-	50	-	66	66	66	66	66	66	66	66	66	66	66	66
21	30 SF	400	-	50	-	67	67	67	67	67	67	67	67	67	67	67	67

(1) Approximate number and type of receptor; type code: SF = single family structure, MF = multiple dwelling unit structures; c = commercial, or office, PK = park, PG = playground, S = school, H = hospital (or nursing home).

(2) Distance refers to the approximate distance between the receptor area and the roadway centerline, in feet.

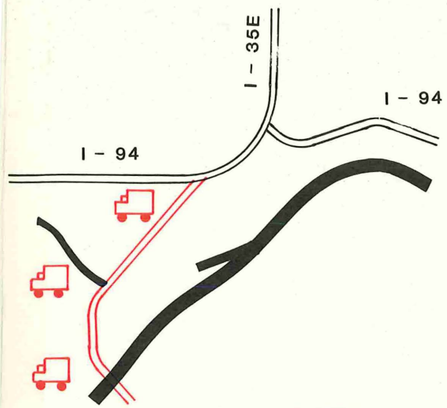
(3) Measured noise levels were determined during June 1979 at all receptors except common area, where measurements were conducted in October, 1979.

ADDITIONAL APPENDICES

All of the appendices listed below are special studies which contain the detailed discussion of impacts identified in the EIS. They are available for public review at the offices of the Metropolitan Council, Minnesota Department of Transportation, and Federal Highway Administration at the addresses listed on the title page of this EIS.

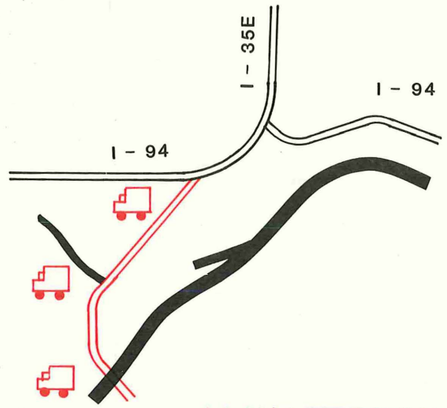
APPENDIX	TITLE
C	Air Quality Impacts
D	Preliminary Noise Analysis
E	Archeological Survey
F	Neighborhood Project Response, Social Impacts
G	Wetlands, Fish and Wildlife
H	Hydrogeology
I	River Morphology and Flood Hazard
J	Water Quality
K	Hydrology/Hydraulics
L	Central Business District Economic Viability and Development Impact
M	Urban Landscape/Aesthetic Analysis
N	Traffic Impacts
O	Soil Properties
P	Land Use
Q	Historic Sites Assessment
R	Potential Impacts, Construction and Operation Vibrations
S	Energy Impact

A



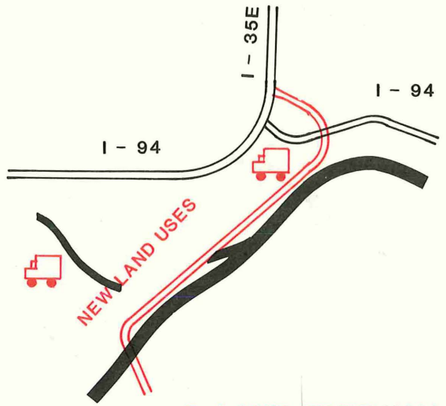
6 LANE FREEWAY

A'



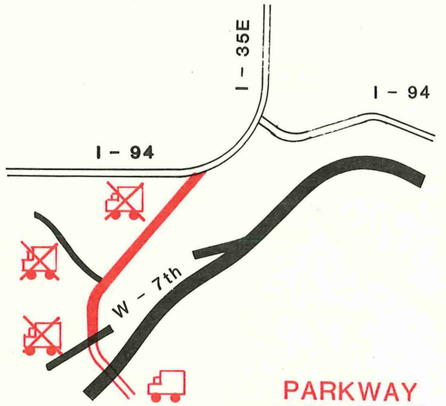
4 LANE FREEWAY

B



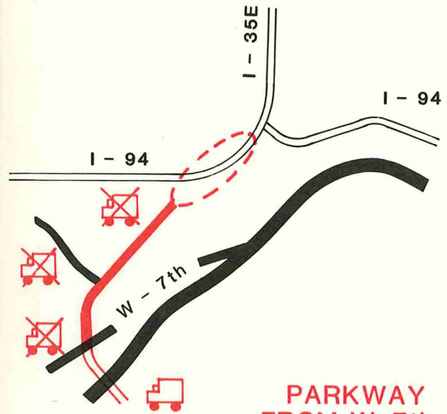
6 LANE FREEWAY

C



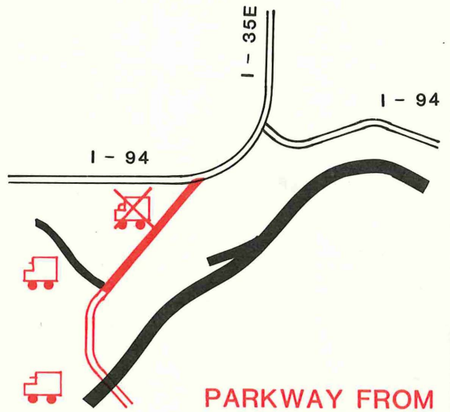
PARKWAY FROM W-7th

D



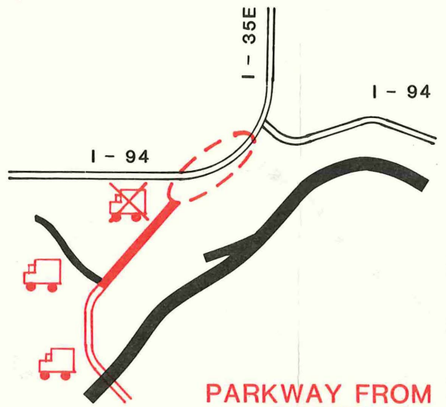
PARKWAY FROM W-7th

E



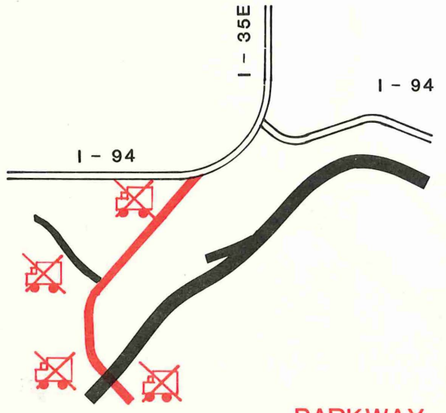
PARKWAY FROM SHORTLINE

F



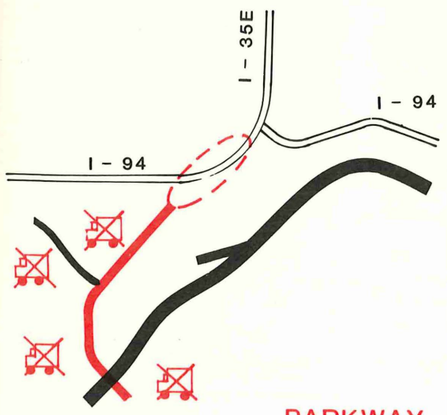
PARKWAY FROM SHORTLINE

G



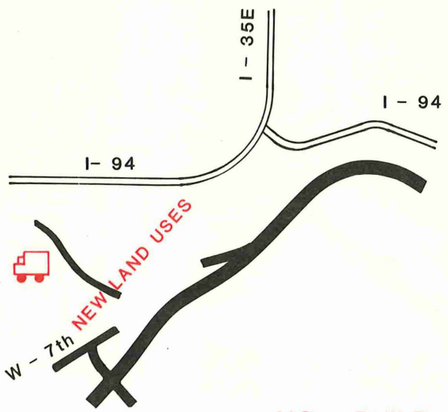
PARKWAY

H



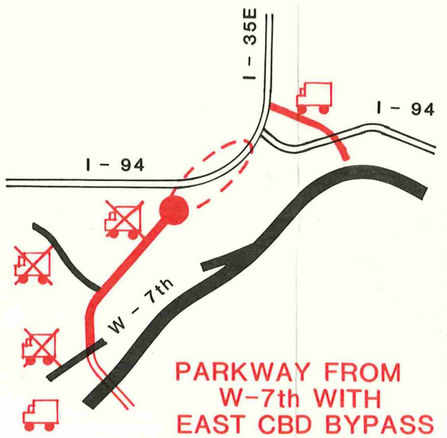
PARKWAY

I



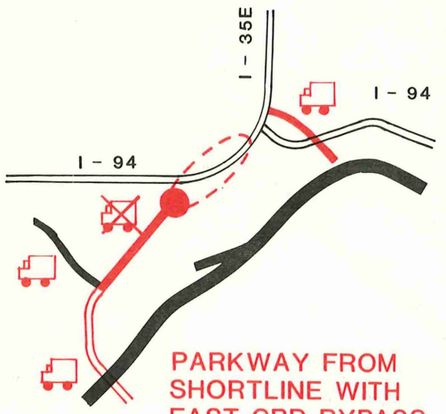
NO - BUILD

J



PARKWAY FROM W-7th WITH EAST CBD BYPASS

K



PARKWAY FROM SHORTLINE WITH EAST CBD BYPASS

FIGURE 8

I - 35E ALTERNATIVES

FREEWAY

PARKWAY OR ARTERIAL

TRUCKS ALLOWED

NO TRUCKS

DIRECT CONNECTION

INDIRECT CONNECTION

AT GRADE INTERSECTION

135E