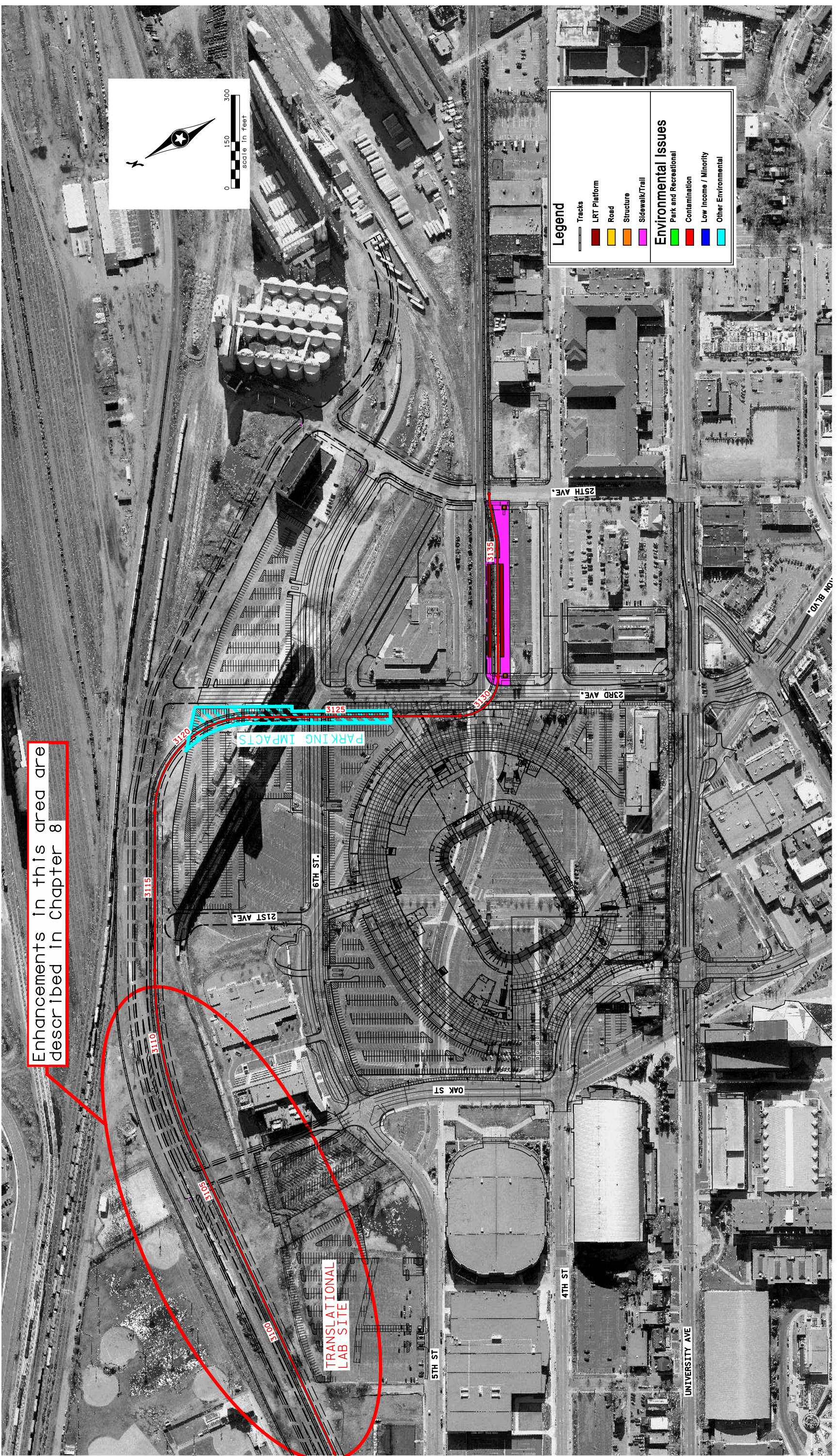


h:\projects\6399\HI-MU\LAYOUT\Environmental\6399_grib.dgn



Since the Central Corridor Management Committee meeting of April 30, 2008, continued feasibility design development of the Northern Alignment has resulted in further enhancements which are described in Chapter 8 of this report.

The Mississippi National River and Recreation Area (MNRRA), a unit of the National Park System, was established by Congress in 1988 to protect and enhance the nationally significant historical, recreational, scenic, cultural, natural, economic, and scientific resources of the river corridor. MNRRA works in partnership with the Mississippi River Critical Area (MRCA) program, a joint local and state program that provides coordinated planning and management for 72 miles of the Mississippi River, four miles of the Minnesota River, and 54,000 acres of adjacent corridor lands. Currently, the Minnesota Department of Natural Resources (DNR), Metropolitan Council, and National Park Service (NPS) work in partnership in various roles to protect and preserve the corridor. Local units of government and regional and state agencies are required to permit development in the corridor only in accordance with adopted plans and regulations. Because MNRRA involves planning and management, but not ownership of public lands, it is not subject to Section 4(f) protection, though publicly-owned recreational land within the MNRRA boundary would be.

In addition to the resources identified above, the University owns a small landscaped open space area at the northwest corner of 19th Avenue S and 3rd Street S. However, this is not anticipated to be considered a public park or recreational use subject to Section 4(f) provisions because it does not serve organized or substantial “walk-in” recreational purposes.

Potential Impacts

Potential impacts to park and recreation areas are summarized in Table 7. While there may be indirect noise and visual impacts to park resources, it is not anticipated that these impacts would rise to the level of “constructive use” under Section 4(f). Direct impacts subject to Section 4(f) protection are discussed below.

West River Parkway and Bridge No. 9 Bikeway have potential historic impacts, which are discussed under Section 5.2.1, Cultural Resources. Temporary direct impacts would likely occur to the park areas and trail on West River Parkway, which runs parallel to the river. Temporary direct impacts would occur to the Bridge No. 9 Bikeway that crosses the Mississippi River, currently using Northern Pacific Railroad Bridge No. 9; this bridge and trail crossing would be replaced with construction of the project.

The University Ball Fields at 19th Avenue S and 1st Street S would be bisected by the proposed alignment, eliminating the ball fields. However, as noted, the Master Plan identifies this use as being relocated.

Concerns for Alignment Feasibility

The status of the Ball Fields as a Section 4(f) resource would need to be determined. If it is determined that the Ball Fields are not a Section 4(f) resource, the remaining impacts do not present any major concerns for feasibility of the Northern Alignment. If the Ball Fields are a Section 4(f) resource, several considerations will need to be evaluated to determine whether the proposed alternative causes least harm to Section 4(f) properties.

Next Steps

- Confirm that the open space at 19th Avenue S and 3rd Street S is not considered a public park or recreational use subject to Section 4(f) provision.
- Consult with FTA, the Minneapolis Park and Recreation Board, and the University to determine whether the Ball Fields and/or Athletic Area are subject to Section 4(f) provisions.
- If the Ball Fields are subject to Section 4(f), evaluate the impact to determine whether the proposed Northern Alignment causes least harm to Section 4(f) properties, including consideration of mitigation.
- Confirm that the potential for indirect impacts to the Athletic Area, and West River Parkway do not constitute constructive use under Section 4(f).
- For any future environmental documentation, a Section 4(f) evaluation will need to be completed for impacts to West River Parkway, Bridge No. 9 Bikeway and, if necessary, the University Ball Fields.

5.2.3 Environmental Justice

Background

Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” dated February 1, 1994, requires that environmental justice be addressed (to the greatest extent practicable and permitted by law) in all federal planning and programming activities. The purpose of Executive Order 12898 is to identify, address, and avoid disproportionately high and adverse human health or environmental effects of programs, policies, and activities on minority populations and low-income populations.

Methodology

Information regarding minority and low-income populations was taken from 2000 census data, general knowledge of the study area, and the U.S. Department of Housing and Urban Development (HUD) website.

Analysis

Race and income data from the 2000 census are presented in Tables 8 and 9. Refer to Figure 27 for a map of the census blocks included in this study. The boundaries are much larger than the immediate affected area, therefore the ability to discern the concentration of low income and/or minority near the proposed alignment is limited. Nonetheless, the census data indicate relatively high levels of poverty in many of area census blocks. Since the project area includes a substantial student population from the University of Minnesota and other surrounding colleges, it can be reasonably determined that the proportion of immediately impacted low-income population will be higher than in the city of Minneapolis as a whole. While it cannot be informed by the large census block data, it is also likely that a higher minority population exists within the project area than in the city as a whole because of the status of the University and surrounding colleges as international educational facilities. Additionally, the Cedar-Riverside neighborhood in the western portion of the project area represents a disproportionately large low-income population, due to the presence of subsidized high rise towers and other affordable housing.

Table 8 – Population, Households and Race – 2000 Census

Demographic Group	State of Minnesota		Hennepin County		City of Minneapolis		Tract 1039		Tract 1040		Tract 1048		Tract 1048	
	Number	% of Population	Number	% of Population	Number	% of Population	Number	% of Population	Number	% of Population	Number	% of Population	Number	% of Population
Households	1,895,127	N/A	456,129	N/A	162,352	N/A	359	N/A	312	N/A	536	N/A	1,824	N/A
Population	4,919,479	100%	1,116,200	100%	382,618	100%	711	100%	743	100%	862	100%	3,889	100%
• White	4,400,282	89.4%	898,921	80.5%	249,186	65.1%	482	67.8%	649	87.3%	561	65.1%	478	12.3%
• Minorities	519,197	10.6%	217,279	19.5%	133,432	34.9%	229	32.2%	94	12.7%	301	34.9%	3,411	87.7%
- Black	171,731	3.5%	99,943	9.0%	68,818	18.0%	10	1.4%	25	3.4%	82	9.5%	1,985	51.0%
- AIAN ⁽¹⁾	54,967	1.1%	11,163	1.0%	8,378	2.2%	4	0.6%	3	0.4%	3	0.3%	24	0.6%
- Asian	141,968	2.9%	53,555	4.8%	23,455	6.1%	183	25.7%	39	5.2%	166	19.3%	882	22.7%
- NHPI ⁽²⁾	1,979	0.0%	531	0.0%	289	0.1%	1	0.1%	0	0.0%	4	0.5%	4	0.1%
- Other Race	65,810	1.3%	23,046	2.1%	15,798	4.1%	10	1.4%	6	0.8%	15	1.7%	230	5.9%
- Two or More Races	82,742	1.7%	29,041	2.6%	16,694	4.4%	21	3.0%	21	2.8%	31	3.6%	286	7.4%
• Hispanic Origin ⁽³⁾	143,382	2.9%	45,439	4.1%	29,175	7.6%	20	2.8%	15	2.0%	32	3.7%	320	8.2%

Demographic Group	Tract 1048		Tract 1048		Tract 1049		Tract 1049		Tract 1049		Tract 1049		Tract 1050	
	Number	% of Population	Number	% of Population	Number	% of Population	Number	% of Population	Number	% of Population	Number	% of Population	Number	% of Population
Households	301	N/A	172	N/A	368	N/A	752	N/A	33	N/A	60	N/A	603	N/A
Population	1,503	100%	1,280	100%	1,547	100%	1,894	100%	3,202	100%	835	100%	1,278	100%
• White	1,084	72.1%	1,041	81.3%	787	50.9%	1,449	76.5%	2,828	88.3%	722	86.5%	1,172	91.7%
• Minorities	419	27.9%	239	18.7%	760	49.1%	445	23.5%	374	11.7%	113	13.5%	106	8.3%
- Black	250	16.6%	111	8.7%	357	23.1%	40	2.1%	100	3.1%	30	3.6%	29	2.3%
- AIAN ⁽¹⁾	22	1.5%	18	1.4%	46	3.0%	6	0.3%	6	0.2%	4	0.5%	7	0.5%
- Asian	80	5.3%	54	4.2%	195	12.6%	328	17.3%	182	5.7%	33	4.0%	45	3.5%
- NHPI ⁽²⁾	0	0.0%	0	0.0%	9	0.6%	3	0.2%	1	0.0%	0	0.0%	1	0.1%
- Other Race	27	1.8%	13	1.0%	17	1.1%	16	0.8%	24	0.7%	9	1.1%	9	0.7%
- Two or More Races	40	2.7%	43	3.4%	136	8.8%	52	2.7%	61	1.9%	37	4.4%	15	1.2%
• Hispanic Origin ⁽³⁾	52	3.5%	22	1.7%	36	2.3%	61	3.2%	70	2.2%	28	3.4%	27	2.1%

Source: Year 2000 U.S. Census Data SF 1 (Tables P3, 8, 15)

(1) AIAN = American Indian or Alaska Native

(2) NHPI = Native Hawaiian & Other Pacific Islander

(3) Those of Hispanic Origin may consider themselves white or of another race; therefore, population totals and percentages will be greater than 100 percent

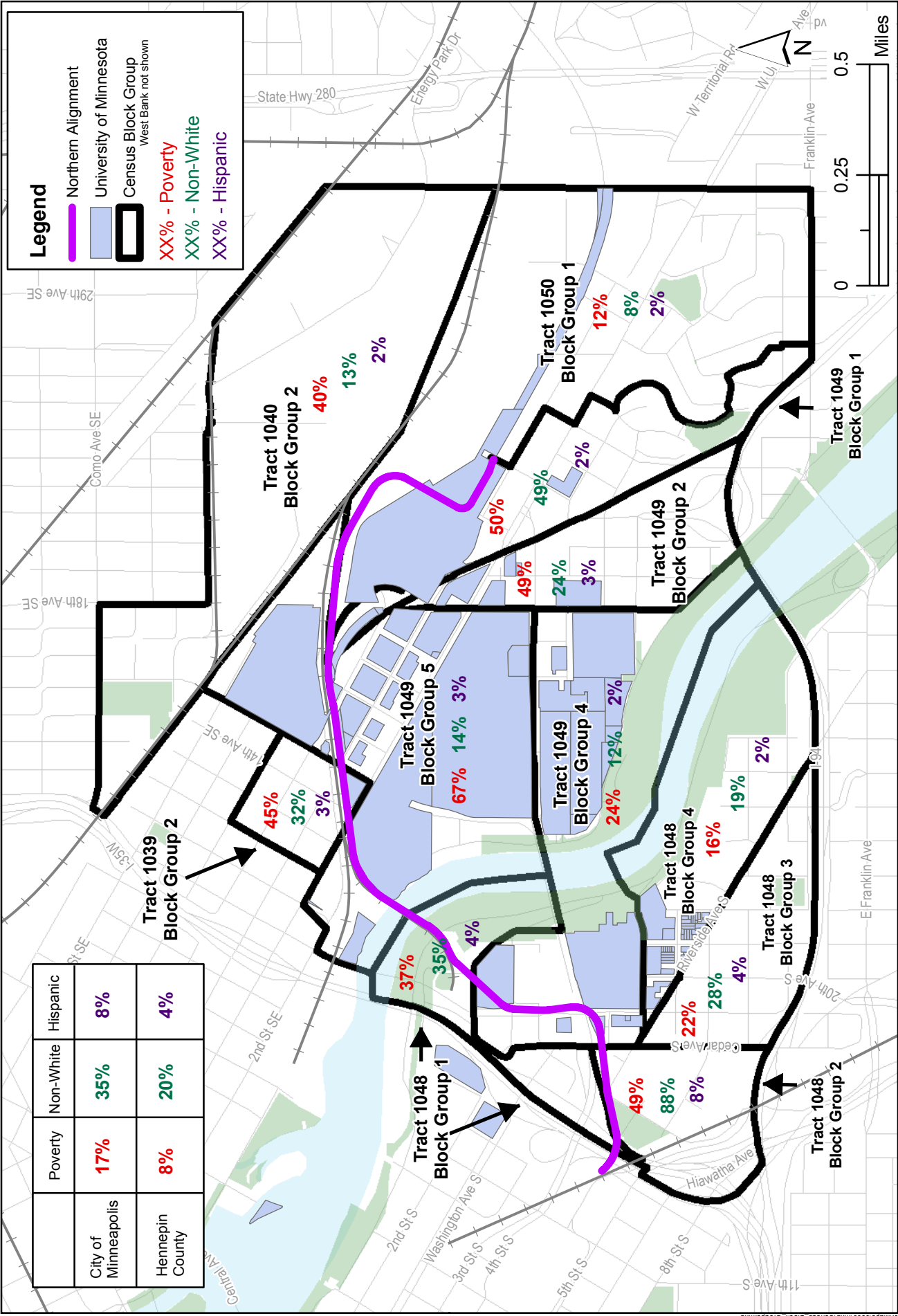
**Table 9 –
Income and Poverty – 2000 Census**

Demographic Group	State of Minnesota	Hennepin County	City of Minneapolis	Tract 1039		Tract 1040		Tract 1048	
				Block Group 2	Block Group 1	Block Group 2	Block Group 1	Block Group 2	Block Group 1
Population	4,794,144	1,092,571	366,915	668	847	859	847	3,924	1,814
Number of Households	1,896,209	456,278	162,382	326	560	390	560	793	1,814
Number of Families	1,262,953	269,112	74,543	53	76	56	76	10,503	1,814
Median household income in 1999 (dollars)	\$47,111	\$51,711	\$37,974	\$17,895	\$17,941	\$18,261	\$17,941	\$10,503	\$15,394
Median family income in 1999 (dollars)	\$56,874	\$65,985	\$48,602	\$20,750	\$26,042	\$48,929	\$26,042	\$15,394	\$15,394
Per capita income in 1999 (dollars)	\$23,198	\$28,789	\$22,685	\$11,879	\$24,577	\$15,055	\$24,577	\$8,283	\$8,283
Percent of population for whom poverty status is determined - all ages (income in 1999 below poverty level) ⁽¹⁾	7.9%	8.3%	16.9%	45.1%	37.0%	39.9%	37.0%	48.5%	48.5%
Percent of families for whom poverty status is determined (income in 1999 below poverty level)	5.1%	5.0%	11.9%	41.5%	28.9%	0.0%	28.9%	44.0%	44.0%

Demographic Group	Tract 1048		Tract 1049		Tract 1049		Tract 1049		Tract 1050	
	Block Group 3	Block Group 4	Block Group 1	Block Group 2	Block Group 4	Block Group 5	Block Group 1	Block Group 5	Block Group 1	Block Group 1
Population	650	343	1,191	1,853	87	114	1,312	593	214	1,312
Number of Households	314	161	343	787	45	49	593	214	1,312	1,312
Number of Families	146	70	205	87	4	0	214	1,312	1,312	1,312
Median household income in 1999 (dollars)	\$23,415	\$28,403	\$29,034	\$22,135	\$17,875	\$10,536	\$47,847	\$89,248	\$47,847	\$47,847
Median family income in 1999 (dollars)	\$28,125	\$30,500	\$28,750	\$51,417	\$75,487	\$0	\$89,248	\$89,248	\$89,248	\$89,248
Per capita income in 1999 (dollars)	\$10,088	\$7,847	\$9,679	\$13,257	\$4,586	\$5,780	\$30,886	\$30,886	\$30,886	\$30,886
Percent of population for whom poverty status is determined - all ages (income in 1999 below poverty level) ⁽¹⁾	22.3%	16.3%	49.9%	48.8%	24.1%	66.7%	11.6%	11.6%	11.6%	11.6%
Percent of families for whom poverty status is determined (income in 1999 below poverty level)	24.0%	14.3%	33.2%	0.0%	0.0%	0.0%	1.4%	1.4%	1.4%	1.4%

Source: Year 2000 U.S. Census Data SF 3 (Tables P10, 53, 77, 82, 87, 90)

(1) Numbers are less / more than population numbers, as poverty status determined for smaller areas such as block groups use weighted samples



CENSUS BLOCK GROUPS

CENTRAL CORRIDOR LRT NORTHERN ALIGNMENT ALTERNATIVE

University of Minnesota



Figure 27

Potential Impacts

General impacts to area low-income and minority populations are not anticipated to be negative or adverse. In fact, the addition of transit options in the area is anticipated to increase accessibility, while also serving as a catalyst for reinvestment and redevelopment.

The proposed alignment would impact four residential dwellings of the Riverbluff complex, which are part of the River Bluff neighborhood located on 20th Avenue S near the University's West Bank. The units are classified by the HUD as subsidized apartments and are therefore assumed to potentially represent low-income residences, though this has not been confirmed. It is not known whether these are minority households.

In addition to the negative impact on the directly affected households, the elimination of the four residential units could negatively impact the remaining River Bluff neighborhood residents if, given that the neighborhood is set up as a cooperative, residents pay association dues or share exterior maintenance duties as part of the cooperative agreement. A reduction in the number of overall units could cause the cost of association dues to increase, while also potentially creating an additional maintenance burden to remaining residents, if the properties are in fact maintained by the residents.

In addition, the proposed alignment poses potential noise and vibration impacts to the River Bluff neighborhood, which is currently located in a relatively quiet area since the Riverview Towers partially shield the neighborhood from highway noise. The addition of a railway would also alter the existing physical landscape and ambiance.

Concerns for Alignment Feasibility

The main concern with the feasibility of the Northern Alignment would be the elimination of four subsidized residential units. The Federal Transit Administration (FTA) will provide federal perspective on this matter. While it is unlikely that this impact would be identified as a fatal flaw with regard to project feasibility, any environmental justice impacts would need to be mitigated.

Next Steps

- Consult with the FTA regarding expectations for documentation, community involvement, and mitigation with regard to environmental justice impacts.
- Collect additional information about income and minority status of households in the River Bluff neighborhood.
- Determine whether there are high and/or disproportionate impacts to low-income or minority populations.
- Investigate opportunities for mitigation
- Pursue opportunities to include appropriate public involvement.

The main concern with the feasibility of the Northern Alignment would be the elimination of four subsidized residential units.

While it is unlikely that this impact would be identified as a fatal flaw with regard to project feasibility, any environmental justice impacts would need to be mitigated.

5.2.4 Hazardous/Regulated Materials

Background

Contaminated properties are a concern for Northern Alignment feasibility if the project would involve liability for expensive clean-up. State and federal regulations place liability for the clean-up of contaminated properties on the owner or operator of the property. In addition, contamination poses safety concerns associated with construction personnel encountering unsuspected wastes or polluted soil or groundwater. Wells are of concern because they provide a pathway for surface contaminants to enter groundwater.

Methodology

Contaminated sites were identified based on information provided on the MPCA website, and information provided by the University of Minnesota (University). Well locations were identified from the Minnesota Department of Health (DOH) County Well Index Database. Potential for impacts was assessed based on evaluation by project staff.

Analysis

Contaminated sites are identified in Table 10. In addition to known information, because the project area is located in a highly developed urban area, and because a portion of the proposed alignment is in a railroad corridor, it is likely that additional contaminated sites exist in the project area. The preliminary Central Corridor LRT Supplemental Draft Environmental Impact Statement (SDEIS) identifies a number of sites that appear to be in or near the Northern Alignment corridor and that have high potential for contamination based on a Phase I Environmental Site Assessment (ESA) conducted for the SDEIS. The Phase I ESA would need to be reviewed to determine the specific location of these sites in relation to the Northern Alignment.

In addition to its identification as a Voluntary Investigation and Cleanup Site, the Burlington Northern Santa Fe (BNSF) Railway corridor is identified as having contamination potential because railroads are associated with herbicides, heavy metal, and oils.

The DOH identifies 17 wells within the project corridor. These wells are listed in Table 11.

Potential Impacts

The proposed alignment is expected to excavate six feet at the University Ball Fields. If excavation were to occur in the area of the former Gas Holder #4, contamination may be encountered.

Excavation would occur along the western edge of the parcel with the University Law School, which has been indicated by the MPCA as a contaminated site; however, it is unknown what portion of the parcel is contaminated and whether any contamination would be encountered for this project.

The BNSF rail line poses contamination concerns because this alignment would follow the rail line for much of the project.

**Table 10 –
Contaminated Properties**

Site #	Site Name	Location	Potential Impacts
1	Humphrey Center ⁽²⁾	301 19th Avenue S	Unlikely; construction would not impact property.
2	19th Avenue S Parking Ramp ⁽²⁾	300 19th Avenue S	Unlikely; construction would not impact property.
3	Management and Economics Building ⁽²⁾	271 19th Avenue S	Unlikely; construction would not impact property.
4	Law School / Utility Building ⁽²⁾	229 19th Avenue S	Potential; excavation would occur near law school.
5	University Law Building Addition ⁽¹⁾	East of 19th Avenue S (West Bank)	Potential; excavation would occur near law school.
6	Gas Holder #4 ⁽¹⁾	Intersection of 19th Avenue S and 2nd Street S (University Ball Fields on West Bank)	Potential; excavation would occur at ball fields.
7	Burlington Northern Santa Fe Railway (BNSF) Right of Way ⁽¹⁾	West of 15th Avenue SE and North of University Avenue SE (Dinkytown)	Likely; Northern Alignment would be located within BNSF right of way.
8	Football Complex ⁽²⁾	600 15th Avenue SE	Unlikely; construction would not impact property.
9	Bierman Field Athletic Building ⁽²⁾	516 15th Avenue SE	Unlikely; construction would not impact property.
10	Translational Lab Site ⁽¹⁾	Northeast of McLaughlin Gormley King buildings; North of Intercampus Transit Way	Unlikely; construction would not impact property.
11	University Integrated Waste Mgmt. B ⁽²⁾	502 23rd Avenue SE	Unlikely; construction would not impact property.
12	University of Minnesota – FTCEM ⁽²⁾	501 23rd Avenue SE	Unlikely; construction would not impact property.

Source: Minnesota Pollution Control Agency

⁽¹⁾ Voluntary Investigation & Cleanup Sites

⁽²⁾ Aboveground or Underground Storage Tank Sites

**Table 11 –
Project Area Wells**

Site #	Site Name	Location	Potential Impacts
558410	MW-5BR	1st Street S & 20th Avenue S (University Ball Fields)	Potential; excavation will occur at ball fields.
558409	MW-5	1st Street S & 20th Avenue S (University Ball Fields)	Potential; excavation will occur at ball fields.
558405	MW-2	1st Street S & 20th Avenue S LM (University Ball Fields)	Potential; excavation will occur at ball fields.
558406	MW-2BR	1st Street S & 20th Avenue S LM (University Ball Fields)	Potential; excavation will occur at ball fields.
682660	U OF M PMW-11	2020 1st Street S	Likely; appears to be within project area.
733205	MW-16	20 20th Avenue S	Likely; appears to be within project area.
243436	MGK CO. PM-4	1715 5th Avenue SE	Unlikely; construction would not impact property.
243431	MGK CO. PM-10	1715 5th Avenue SE (BNSF Right of Way)	Potential; Northern Alignment is located within BNSF right of way.
674780	U OF M MW-3	5th Street SE & Oak Street LM	Potential; Northern Alignment is located within BNSF right of way.
329049	U OF M Buckeye Lot	6th Street SE Buckeye Lot	REMOVE THIS WELL
329052	U OF M Buckeye Lot East	6th Street SE Buckeye Lot East	REMOVE THIS WELL
329053	U OF M Buckeye Lot East	6th Street SE Buckeye Lot East	Potential; appears to be within project area. However, well status is unknown due to stadium construction.
329054	U OF M Buckeye Lot East	6th Street SE Buckeye Lot East	REMOVE THIS WELL
329055	U OF M Buckeye Lot East	6th Street SE Buckeye Lot East	Potential; appears to be within project area. However, well status is unknown due to stadium construction.
436166	W-2	Oak Street	Potential; appears to be within project area. However, well status is unknown due to stadium construction.
656980	U OF M MW-4A	4th Street SE & 26th Avenue SE LM	REMOVE THIS WELL

Source: Minnesota Department of Health County Well Index

Based on available information, it is unknown precisely where the Translational Lab Site is located, so it is unclear whether the site is located directly within the construction area of the proposed project.

Several aboveground or underground storage tank sites are located in the Northern Alignment corridor. It is possible that storage tanks may be encountered with construction of the proposed alignment.

All of the wells appear to be in the Northern Alignment corridor and are anticipated to be potentially impacted as a result of the proposed alignment.

In addition, more information regarding the high potential properties identified in the preliminary SDEIS is needed to assess the potential for impacts to those properties.

Other contamination impacts would be due to the potential for the construction to encounter contaminants migrating from outside the project corridor. Any contamination encountered through additional study or during construction would need to be handled in a manner consistent with MPCA requirements.

Concerns for Alignment Feasibility

Based on available information, contamination is not expected to be of particular concern for the feasibility of the Northern Alignment. No known fatal flaws with regard to contamination are expected to impact project feasibility.

Next Steps

- Conduct a Phase I Environmental Site Assessment (ESA) for any areas not previously covered.
- Based on analysis of Phase I ESA information, identify sites for a Phase II assessment.
- Evaluate potential cost implications for encountering and handling contaminated soil or groundwater.

5.2.5 Other Environmental Issues

Background

The key considerations for determining the feasibility of the proposed alignment include cultural resources (Section 106 and Section 4[f]), parks and trails (Section 4[f]), contamination (clean-up liability/cost), and low-income/minority populations (environmental justice). These are discussed in the sections above.

As part of the future evaluation under the National Environmental Policy Act (NEPA), many social, economic, and environmental factors need to be addressed in addition to the four topics discussed above. This section is intended to provide an overview of these issues.

Methodology

The impact potential for each issue was analyzed using information from existing plans, maps, aerial photos, and other readily available sources.

Based on available information, contamination is not expected to be of particular concern for the feasibility of the Northern Alignment. No known fatal flaws with regard to contamination are expected to impact project feasibility.

Analysis and Impacts

Table 12 lists each of the social, economic, and environmental issues that would need to be addressed as part of the evaluation under NEPA. The table includes the potential for impacts, based on known information.

Next Steps

- Complete a NEPA document that addresses the above social, economic, and environmental impacts

5.3 Summary and Conclusions

Table 12 presents a summary of potential environmental issues identified in the environmental analysis of this Feasibility Study. Those identified as most critical to alignment feasibility, and next steps required to resolve those concerns are as follows:

- Bridge 9 has been determined eligible for the National Register of Historic Places and would be demolished with the Northern Alignment: Consultation would be required between Mn/DOT's Cultural Resources Unit, the FTA, and the State Historic Preservation Office to determine if this adverse effect is avoidable and if not, to determine appropriate mitigation measures.
- Demolition of four Section 8 (affordable) housing units: Further consultation would be needed with the property owner (West Bank Community Development Corporation) to determine if units can be replaced on site. In addition, safety concerns due to the proximity of the LRT line would need to be addressed.
- Section 4(f) "use" of parklands and trail facilities: Many of these impacts are temporary and limited to the period of construction. Further consultation is needed between the FTA and the park/trail owners to determine appropriate documentation requirements.
- Potential contamination issues: Contamination from previous industrial activities on the West Bank portion of the alignment and railroad use on the East Bank portion may require special treatment/disposal measures. While not expected to affect feasibility of the alignment, this contamination may limit cost implications for construction.

These issues, as well as those listed in Table 12 will require more thorough examination and discussion in an Environmental Impact Statement prepared under NEPA standards.

**Table 12 –
NEPA Environmental Issues**

Issue	Potential for Impacts	Notes
<i>Social and Land Use Impacts</i>		
Land Use and Socioeconomics	Low potential for impacts	
Neighborhoods, Community Services, and Community Cohesion	Low potential for impacts	
Acquisitions and Displacements/Relocations	4 displacements expected	
Cultural Resources	Potential impacts to historic properties	See discussion in Section 4.2.1
Parklands and Recreation Areas	Some temporary impacts; elimination of University of Minnesota Ball Fields.	See discussion in Section 4.2.2
Visual and Aesthetic Conditions	Views along river; aesthetics in Cedar-Riverside neighborhood	MNRRA consultation needed
Safety and Security	Low potential for impacts	
Environmental Justice	Potential impacts to low-income populations	See discussion in Section 4.2.3
<i>Environmental Impacts</i>		
Groundwater and Soil Resources	Areas of steep slopes along river bluff and highly erodible soils along bluff on West Bank	
Water Resources	Rail line will result in increase of impervious surfaces. Storm water management needs analysis. Additional right of way may be needed for BMPs	
Biota and Habitat	Potential for impacts to aquatic habitat due to bridge construction	Minnesota DNR consultation needed
Threatened and Endangered Species	Low potential for impacts	Minnesota DNR and USFWS consultation needed
Air Quality	Low potential for impacts	
Noise	Noise may impact residences on the west bank of the river	Analysis needed
Vibration	Vibration may impact residences on the west bank of the river	Analysis needed
Hazardous/Regulated Materials	Some potential for contamination	See discussion in Section 4.2.4
Electromagnetic Fields and Utilities	Unknown impacts	Analysis needed
Energy	Unknown impacts	Analysis needed
<i>Economic Impacts</i>		
Station Area Impact Assessment	Unknown impacts	
<i>Transportation Impacts</i>		
Transit Effects	Unknown impacts	
Effects on Roadways	Low potential for impacts	
Other Transportation Impacts	Removal of some planned parking spaces near University stadium. Sanitary sewer near University of Minnesota Law School may need to be relocated due to LRT crossing.	

6 Fully Loaded Capital Costs

6.1 Standard Cost Categories

In order to qualify for Federal New Starts Grant assistance, all new transit projects must comply with the Standard Cost Categories (SCC) set forth by the Federal Transit Administration (FTA). The SCC is a capital cost reporting format designed to establish a consistent system for reporting, estimating, and managing capital costs for New Starts projects. Under the SCC, all project sponsors report cost estimates using predefined standard costs categories. This promotes transparency in cost estimates, establishes a knowledge base of reasonable cost ranges, and makes it possible to compare different projects based on uniform reporting standards. The SCC is used for fully loaded capital cost estimates for both the Washington Avenue Alignment as well as the Northern Alignment. By definition, the fully load capital cost includes the capital cost items, an escalation factor to the midpoint of construction, preliminary and final design, right-of-way, project management for design and construction, mobilization, construction administration, insurance, as well as other permits, review, testing, inspection and unallocated contingency costs.

6.2 Feasibility of Northern Alignment Fully Loaded Capital Costs

As is required by the FTA, both the Northern Alignment and Washington Avenue Alignment use the SCC reporting format and can therefore be compared across cost categories. A rigorous cost estimation process was undertaken as part of this study to ensure conformity of the Northern Alignment and Washington Avenue Alignments' fully loaded capital costs, from western match point to eastern match point. The following fully loaded capital costs were determined and agreed to in principle by the Central Corridor Project Office (CCPO) and its consultants as well as by the University of Minnesota and its consultants.

- Washington Avenue Alignment Fully Loaded Capital Costs = \$173,976,313
- Northern Alignment Fully Loaded Capital Costs = \$159,674,454¹²

Based on the Northern Alignment's fully loaded capital cost from match point to match point, The Northern Alignment is \$14,301,859 lower than the fully loaded capital costs for the Washington Avenue Alignment. On the basis of capital cost, the Northern Alignment is reasonable within the context of the CCLRT scope and budget.

¹² The Northern Alignment's Fully Loaded Capital Costs does not include additional enhancements that would reduce its Fully Loaded Capital Costs by \$5.6 million. Refer to Chapter 8 regarding enhancement details.

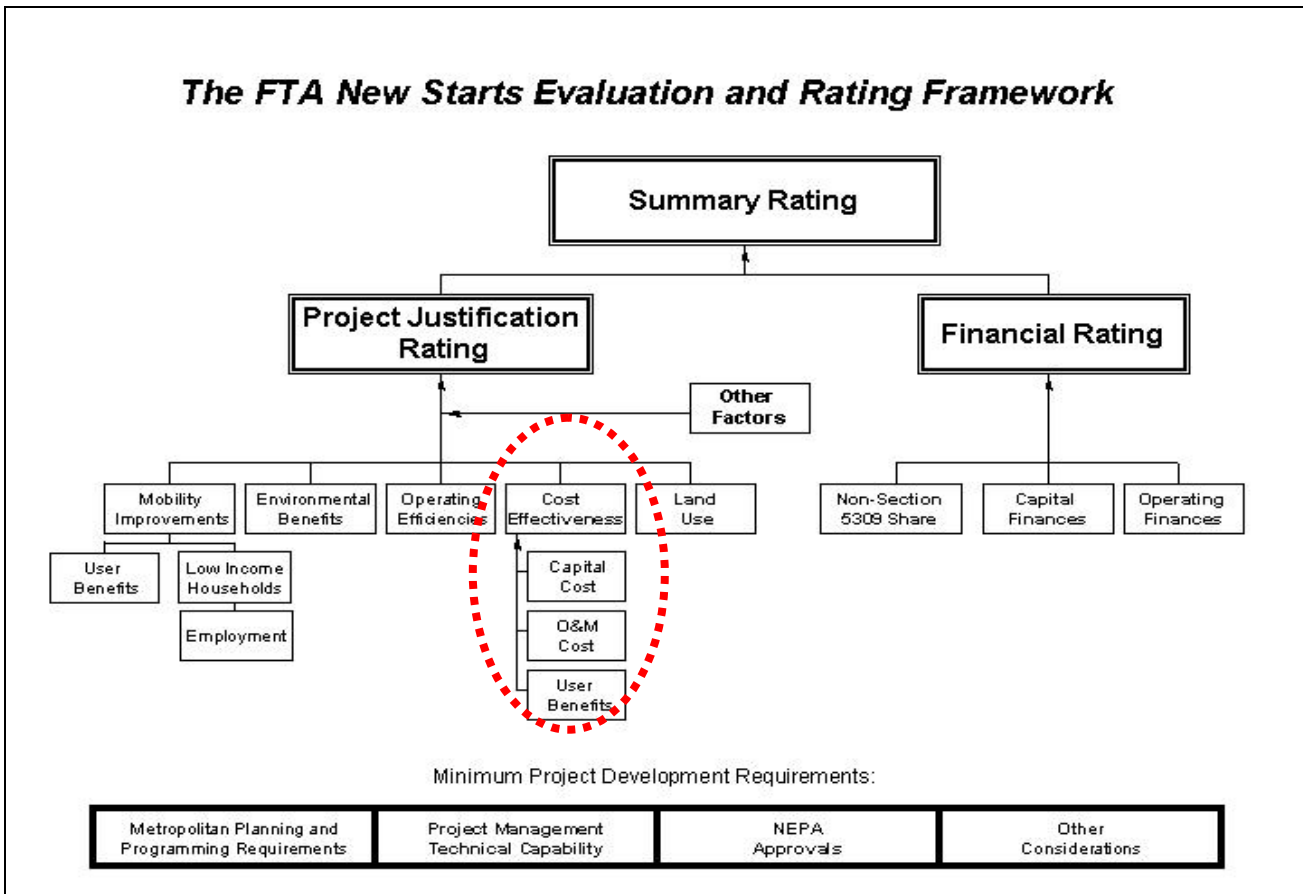
7 Cost Effectiveness Index (CEI)

7.1 Comparison of Fully Loaded Capital Costs

Cost effectiveness examines a proposed transit project’s capital and operating/maintenance (O&M) costs in comparison to the user benefits it generates. It is one of many factors analyzed by the FTA to determine funding of New Start fixed guideway transit projects. Figure 28 displays the various inputs used to determine the final summary rating¹³.

It, along with mobility improvements, environmental benefits, operating efficiencies, land use, and other factors (economic development, etc.), are the elements considered in determining a project’s justification rating¹⁴. The project justification rating is then combined in equal proportion to the financial rating to assign an overall summary rating.

Figure 28 FTA New Starts Evaluation and Rating Framework



¹³ Figure 28 and other information related to the FTA evaluation can be found in the FTA’s *FY 2009 New Starts and Small Starts Evaluation and Rating Process*.

¹⁴ Only the CEI and land use elements are actually utilized (each is given a 50 percent weight) to determine the project justification rating. The other inputs are considered, but do not weigh into the actual calculation of the project justification rating.

FTA has developed a Cost Effectiveness Index (CEI), which is the incremental cost per hour of user benefits in the forecast year (2030). Both costs and user benefits are taken as the incremental difference from a low-cost baseline alternative that represents the best that can be done in a corridor without a major capital investment. Annualized capital costs take into account the useful life of various components of the system (e.g., buses wear out faster than track). Annual operating and maintenance costs include bus and any rail service. User benefits include the equivalent hours of travel time savings per year associated with the transit service changes for all users of the transportation system. The result of this calculation is a measure of the project cost per hour of user benefits expected for the project.

The measure of cost effectiveness that FTA uses in project evaluation is defined as:

$$\text{CEI} = \frac{\text{Incremental annualized capital cost} + \text{incremental operating/maintenance cost}}{\text{User benefits (annual hours)}}$$

FTA establishes breakpoints to translate the value of the cost effectiveness measure for each project into a cost effectiveness rating. FTA assigned a “low” rating for cost effectiveness to projects returning benefits at a cost of \$30.00 per hour or higher and used more stringent breakpoints to assign the higher ratings shown in Table 13. Consequently, lower dollar amounts imply a lower cost per hour of transportation system user benefit. Proposed projects with a lower cost per hour of projected travel-time benefits are evaluated as more cost effective than those with a higher cost per hour of projected travel-time benefits. More cost effective projects have a great likelihood of receiving federal funding.

**Table 13 –
Cost Effectiveness Breakpoints**

High	\$11.99 and under
Medium-High	\$12.00 - \$15.49
Medium	\$15.50-\$23.99
Medium-low	\$24.00-\$29.99
Low	\$30.00 and over

In addition to earning an overall summary rating of *Medium*, *Medium-High*, or *High*, a cost effectiveness rating of *Medium*, *Medium-High*, or *High* (i.e., a Cost Effectiveness Index of \$23.99 or lower) is recommended by the FTA to be considered for federal funding. Achieving these ratings does not, however, guarantee federal funding in any given fiscal year. Federal funding also depends on other factors including budget constraints, completion of the federal environmental review process, demonstrated technical capability to construct and operate the project, development of a firm and final cost estimate and financial plan.

7.2 Cost Effectiveness Index Feasibility for Northern Alignment

The Cost Effectiveness Index for the Washington Avenue Alignment as determined by the Central Corridor Project Office's consultant (DMJM Harris) as of April 30, 2008 was reported to be in the upper \$23 range. This CEI is in the higher portion of the *Medium* range and qualifies the Washington Avenue Alignment as eligible for federal transit New Starts funding based on the FTA guidelines.

To ensure consistency, the Cost Effectiveness Index for the Northern Alignment was also conducted by DMJM Harris, under contract with the University of Minnesota. Conformity and concurrence on the Cost Effective Index (CEI) for the Northern Alignment was not reached between the U of M and the Central Corridor Project Office (CCPO) prior to publication of this feasibility report. A supplemental technical memorandum detailing the Northern Alignment's CEI and its assumptions will be issued once conformance and concurrence between the CCLRT project partners and their consultants is reached.

8 Northern Alignment Enhancements

8.1 Background

In an effort to provide decision makers with the ability to compare and judge the relative merits of the Northern Alignment vis-à-vis the Washington Avenue Alignment, the U of M, its consultants, and the CCPO worked closely to coordinate and establish consistent assumptions for the Northern Alignment. In addition to the close working relationship of the U of M with the CCPO, the U of M also contracted directly with CCPO's consultants, Connetics, AECOM, and DMJM Harris to provide technical services related to fully loaded capital cost estimation, CCLRT operations, ridership forecasts, travel time estimates, and the CEI.

The close level of coordination is evidenced and can be traced by the “Comments and Responses Tracking Tables” in Appendix B. It should also be noted that due to resource challenges, the CCPO was not able to review or provide feedback to questions, issues, and value-added enhancements from the U of M or its consultants after April 30, 2008. This precluded the following enhancement concepts from discussion and inclusion in the “Base” Northern Alignment. Thus, an “Enhanced” Northern Alignment (shown in red in Figure 29) is being introduced to supplement the Base Northern Alignment that has been described in this Feasibility Study. The net effect of these enhancements is a \$5.6 million reduction in the Northern Alignment's match point to match point, fully loaded capital costs. In addition, these enhancements were engineered to mitigate potential right-of-way, operations, and environmental impacts. Additional enhancements may be identified for the Northern Alignment during the preliminary design and value engineering process.

8.2 Description of Enhancements

The enhancements to the Northern Alignment occur in two separate locations, one on the West Bank and the other on the East Bank. Figure 29 shows the Enhanced Northern Alignment (depicted in red) and the Washington Avenue Alignment (depicted in blue).

8.2.1 West Bank Enhancements

The West Bank enhancements include realignment of track north of the Washington Avenue/Law School Access Bridge to south of Bridge 9, as shown in Figure 30. North of the Washington Avenue/Law School Access Bridge, the Enhanced Northern Alignment deviates from the Base Northern Alignment by shifting east and then continuing north across the University Ball Fields parallel to 20th Avenue South. The Enhanced Northern Alignment then connects to the Base Northern Alignment northwest of the Riverbluff subsidized townhouse property prior to reaching Bridge 9.