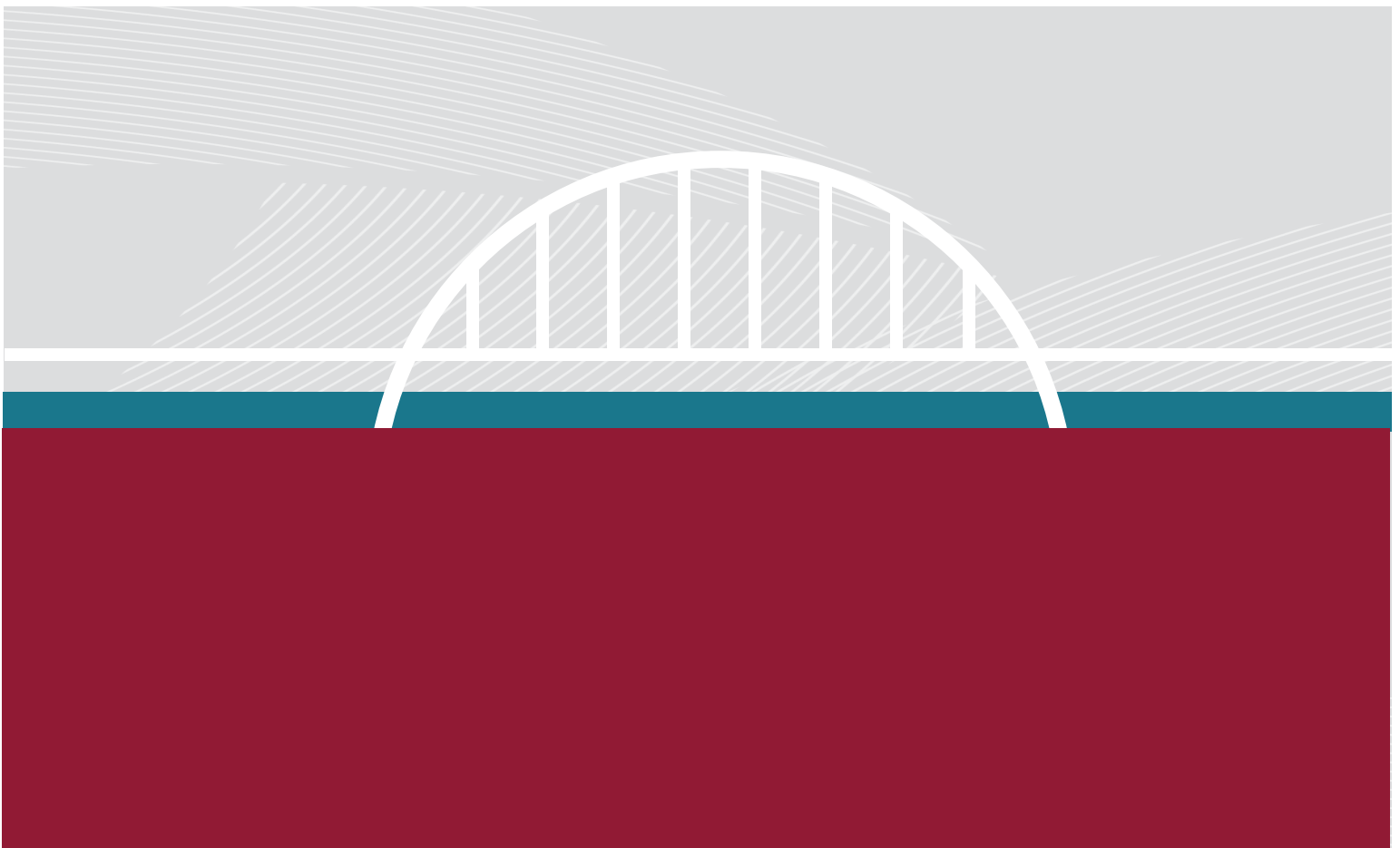


# Appendix B

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## **EVALUATION MATRIX**

FOR FUTURE BRIDGE TRAFFIC IMPACT STUDY  
GRAND FORKS-EAST GRAND FORKS



Rating
Highly negative result
- Negative result
N Neutral
+ Positive result
++ Highly positive result

Evaluation Criteria	Measure	Alternatives					
		No Build		Elks Drive		32nd Ave	
		Measurement	Rating	Measurement	Rating	Measurement	Rating
<b>Project Purpose</b>							
<b>Compatible with project purpose</b>	Yes or No	No	-	Yes	+	Yes	+
<b>Mobility and Congestion</b>							
<b>Point Bridge Congestion</b>	2045 LOS (V/C)	E (0.99)	-	A (0.57)	++	B (0.61)	++
<b>Study Corridor Congestion</b>	System average V/C = [sum of each segment's (V/C*AADT*length)]/[sum	C (0.74)	+	B (0.62)	++	B (0.63)	++
S Washington St	Demers to 24th	F (1.03)	-	D (0.89)	N	E (0.92)	-
S Washington St	24th to 32nd	D (0.89)	N	D (0.83)	N	D (0.83)	N
S Washington St	32nd to 40th	D (0.89)	N	D (0.82)	N	D (0.83)	N
Belmont Rd	4th to Elks Dr	B (0.63)	++	A (0.43)	++	A (0.43)	++
Belmont Rd	Elks to 24th	A (0.56)	++	D (0.87)	N	A (0.37)	++
Belmont Rd	24th to 32nd	B (0.69)	++	C (0.76)	+	A (0.53)	++
Belmont Rd	32nd to 40th	A (0.48)	++	A (0.43)	++	A (0.44)	++
32nd Ave S	20th to Washington	C (0.77)	+	C (0.73)	+	C (0.77)	+
32nd Ave S	Washington to Cherry	A (0.42)	++	A (0.53)	++	C (0.73)	+
32nd Ave S	Cherry to Belmont	A (0.27)	++	A (0.41)	++	B (0.63)	++
24th Ave S	Washington to Cherry	A (0.35)	++	A (0.53)	++	A (0.35)	++
24th Ave S	Cherry to Belmont	A (0.14)	++	A (0.36)	++	A (0.13)	++
4th Ave S	Demers to Cherry	D (0.88)	N	A (0.58)	++	B (0.63)	++
4th Ave S	Cherry to Belmont	C (0.72)	+	A (0.44)	++	A (0.49)	++
4th Ave S	4th & Belmont to 1st & 3rd	E (0.99)	-	A (0.57)	++	B (0.61)	++
Cherry St	4th to 24th	A (0.42)	++	A (0.31)	++	A (0.31)	++
Cherry St	24th to 32nd	A (0.32)	++	A (0.27)	++	A (0.23)	++
Cherry St	32nd to 40th	A (0.39)	++	A (0.38)	++	A (0.39)	++
2nd Ave NE	2nd & US 2 to 3rd & 1st	B (0.62)	++	A (0.50)	++	A (0.52)	++
3rd Ave SE	3rd & 1st to Byglund & Rhinehart	C (0.78)	+	A (0.51)	++	A (0.54)	++
Byglund Rd SE	Rhinehart to Greenway	A (0.38)	++	A (0.25)	++	A (0.27)	++
Byglund Rd SE	Greenway to Byglund	A (0.17)	++	A (0.24)	++	A (0.13)	++
Byglund Rd SE	190th to Byglund	A (0.14)	++	A (0.31)	++	A (0.35)	++
Byglund Rd SE/Harley Dr	Byglund & Byglund to TH 220 & Harley Dr	A (0.14)	++	A (0.30)	++	A (0.35)	++
Rhinehart Dr SE	Byglund to Greenway	A (0.26)	++	A (0.22)	++	A (0.23)	++
Rhinehart Dr SE	Greenway to Elks Bridge	A (0.03)	++	A (0.53)	++	A (0.31)	++
Rhinehart Dr SE	Elks Bridge to 32nd Bridge	A (0.03)	++	A (0.18)	++	A (0.31)	++
Rhinehart Dr SE	32nd Bridge to 190th	A (0.03)	++	A (0.18)	++	A (0.44)	++
Rhinehart Dr SE	South of 190th	A (0.02)	++	A (0.03)	++	A (0.03)	++
Greenway Blvd SE	Rhinehart to Byglund	A (0.21)	++	A (0.47)	++	A (0.28)	++
Greenway Blvd SE	East of Byglund	A (0.36)	++	A (0.35)	++	A (0.34)	++
TH 220	South of Harley	A (0.05)	++	A (0.04)	++	A (0.04)	++
TH 220	Harley to US 2	A (0.17)	++	A (0.33)	++	A (0.37)	++
TH 220	North of US 2	A (0.00)	++	A (0.00)	++	A (0.00)	++
Demers Ave	20th to Washington	C (0.78)	+	B (0.64)	++	B (0.65)	++
Demers Ave	Washington to 4th	E (0.96)	-	C (0.78)	+	C (0.80)	+
190th St SW	East of Rhinehart	A (0.01)	++	A (0.15)	++	A (0.42)	++
US 2	West of 220	A (0.37)	++	A (0.27)	++	A (0.26)	++
US 2	East of 220	A (0.28)	++	A (0.28)	++	A (0.27)	++
<b>Study Intersections - Congestion Mitigation Needed</b>	Number of intersections requiring mitigation	5	-	6	-	5	-
<b>Study Intersections - Congestion After Mitigation</b>	Number of intersections LOS E or worse after feasible mitigation	0	+	0	+	0	+
<b>Multimodal System Linkage</b>							
<b>Total miles of travel on the system (distance)</b>	Urban VMT (Tables 38 and 39 from Appendix C - Red River Crossing Analysis)	1,054,784	N	14,600 less	+	24,721 less	++
<b>Total hours of travel on the system (time)</b>	VHT (Tables 38 and 39 from Appendix C - Red River Crossing Analysis)	59,702	N	522 less	+	831 less	++
<b>Total miles of travel on study corridors (distance)</b>	Values from ATAC Travel Demand Model	205,490	N	314 less	+	3,448 less	++
<b>Total hours of travel on study corridors (time)</b>	Values from ATAC Travel Demand Model	3,430	N	66 less	+	112 less	++
<b>Ped/bike connectivity</b>	Number and distribution of ped/bike connections across river	4	-	5/less spread	+	5/more spread	++
<b>Community and Economic Factors</b>							
<b>Total miles of travel on study corridors (distance)</b>	Vehicles x Miles of Travel (VMT; from ATAC Travel Demand Model)	205,490	N	314 less	+	3,448 less	++
S Washington St (Principal Arterial)	Demers to 24th	44,101	N	42,356 (-4%)	+	43,159 (-2%)	+
S Washington St (Principal Arterial)	24th to 32nd	15,337	N	15,717 (+2%)	-	15,431 (+1%)	-
S Washington St (Principal Arterial)	32nd to 40th	13,624	N	14,093 (+3%)	-	14,238 (+5%)	-
Belmont Rd (Minor Arterial)	4th to Elks Dr	9,717	N	7,019 (-28%)	++	6,802 (-30%)	++
Belmont Rd (Minor Arterial)	Elks to 24th	553	N	981 (+77%)	-	415 (-25%)	+
Belmont Rd (Minor Arterial)	24th to 32nd	3,701	N	3,812 (+3%)	-	2,285 (-38%)	++
Belmont Rd (Minor Arterial)	32nd to 40th	2,996	N	2,400 (-20%)	+	2,483 (-17%)	+
32nd Ave S (Principal Arterial)	20th to Washington	12,118	N	14,045 (+16%)	-	14,322 (+18%)	-
32nd Ave S (Minor Arterial)	Washington to Cherry	2,423	N	3,149 (+30%)	-	4,225 (+74%)	-
32nd Ave S (Minor Arterial)	Cherry to Belmont	1,316	N	1,761 (+34%)	-	2,698 (+105%)	-
24th Ave S (Major Collector)	Washington to Cherry	1,635	N	2,570 (+57%)	-	1,790 (+9%)	-
24th Ave S (Major Collector)	Cherry to Belmont	189	N	1,221 (+546%)	-	441 (+133%)	-
4th Ave S (Minor Arterial)	Demers to Cherry	973	N	755 (-22%)	+	822 (-16%)	+
4th Ave S (Minor Arterial)	Cherry to Belmont	2,687	N	1,791 (-33%)	++	1,989 (-26%)	++
4th Ave S (Minor Arterial)	4th & Belmont to 1st & 3rd	8,070	N	4,789 (-41%)	++	5,210 (-35%)	++
Cherry St (Major Collector)	4th to 24th	4,634	N	3,546 (-23%)	+	3,619 (-22%)	+
Cherry St (Major Collector)	24th to 32nd	1,419	N	1,392 (-2%)	+	1,233 (-13%)	+
Cherry St (Major Collector)	32nd to 40th	2,044	N	1,904 (-7%)	+	1,931 (-6%)	+
2nd Ave NE (Minor Arterial)	2nd & US 2 to 3rd & 1st	4,075	N	3,359 (-18%)	+	3,395 (-17%)	+
3rd Ave SE (Minor Arterial)	3rd & 1st to Byglund & Rhinehart	7,412	N	5,075 (-32%)	++	5,358 (-28%)	++
Byglund Rd SE (Minor Arterial)	Rhinehart to Greenway	5,056	N	3,681 (-27%)	++	3,845 (-24%)	+
Byglund Rd SE (Minor Arterial)	Greenway to Byglund	1,896	N	2,812 (+48%)	-	1,507 (-21%)	+
Byglund Rd SE (Minor Arterial)	190th to Byglund	495	N	1,180 (+138%)	-	1,369 (+177%)	-
Byglund Rd SE/Harley Dr (Minor Arterial)	Byglund & Byglund to TH 220 & Harley Dr	1,089	N	2,130 (+96%)	-	2,454 (+125%)	-
Rhinehart Dr SE (Major Collector)	Byglund to Greenway	2,663	N	2,078 (-22%)	+	2,126 (-20%)	+
Rhinehart Dr SE (Minor Collector/Local Road)	Greenway to Elks Bridge	116	N	874 (+653%)	-	512 (+341%)	-
Rhinehart Dr SE (Local Road)	Elks Bridge to 32nd Bridge	141	N	1,807 (+1182%)	-	1,761 (+1149%)	-
Rhinehart Dr SE (Local Road)	32nd Bridge to 190th	58	N	425 (+633%)	-	732 (+1162%)	-
Rhinehart Dr SE (Local Road)	South of 190th	115	N	144 (+25%)	-	149 (+30%)	-
Greenway Blvd SE (Major Collector)	Rhinehart to Byglund	965	N	2,332 (+142%)	-	1,146 (+19%)	-
Greenway Blvd SE (Minor Collector)	East of Byglund	912	N	535 (-41%)	++	531 (-42%)	++
TH 220 (Minor Arterial)	South of Harley	457	N	416 (-9%)	+	367 (-20%)	+
TH 220 (Minor Arterial)	Harley to US 2	2,103	N	3,878 (+84%)	-	4,298 (+104%)	-
TH 220 (Major Collector)	North of US 2	14	N	3 (-79%)	++	3 (-79%)	++
Demers Ave (Principal Arterial)	20th to Washington	13,040	N	11,682 (-10%)	+	11,906 (-9%)	+
Demers Ave (Principal Arterial)	Washington to 4th	6,883	N	5,900 (-14%)	+	6,036 (-12%)	+
190th St SW (Local Road)	East of Rhinehart	88	N	2,308 (+2523%)	-	5,861 (+6560%)	-
US 2 (Principal Arterial)	West of 220	15,187	N	11,066 (-27%)	++	10,725 (-29%)	++
US 2 (Principal Arterial)	East of 220	571	N	570 (-0%)	+	555 (-3%)	+
US 2B (Minor Arterial)	2nd to US 2	12,422	N	7,082 (-43%)	++	6,668 (-46%)	++
<b>Traffic change on study corridors adjacent to schools</b>	Based on traffic exposure at all schools in study area (see measures below)	55,170	N	53,684 (-3%)	+	54,896 (-0%)	N
Phoenix Elementary School	2045 AADT on adjacent road (4th Ave S, Belmont Rd)	17,220	N	11,060 (-36%)	++	11,710 (-32%)	++
Lewis & Clark Elementary School	2045 AADT on adjacent road (13th Ave S)	5,546	N	5,448 (-2%)	+	5,420 (-2%)	+
Holy Family-St. Mary's Private School	2045 AADT on adjacent road (17th Ave S)	5,184	N	5,356 (+3%)	-	5,216 (+1%)	-
Viking Elementary School	2045 AADT on adjacent road (24th Ave S)	3,690	N	5,510 (+49%)	-	3,680 (-0%)	+
Kelly Elementary School	2045 AADT on adjacent road (Cherry St, 32nd Ave S)	8,670	N	9,560 (+10%)	-	11,660 (+34%)	-
Schroeder Middle School	2045 AADT on adjacent road (Cherry St, 32nd Ave S)	8,670	N	9,560 (+10%)	-	11,660 (+34%)	-
South Point Elementary School	2045 AADT on adjacent road (13th St SE)	3,740	N	3,620 (-3%)	+	3,600 (-4%)	+
Central Middle School	2045 AADT on adjacent road (Byglund Rd)	2,450	N	3,570 (+46%)	-	1,950 (-20%)	+
<b>Consistency with approved transportation plans</b>	Is the alternative consistent with LRTP and city plans?	No	-	No	N	Yes	+
<b>Support for economic development</b>	Degree of improved regional accessibility provided (qualitative)	No Change	N	Improve	+	Improve	+
<b>Impact to the Greenway (a protected Section 4(f) resource)</b>	Level of impact	None	N	Smaller footprint	-	Larger footprint	-
<b>Environmental Impacts</b>							
<b>Potential impact on flood protection system</b>	Qualitative/planning level assessment	No change	N	No change	N	Potential impact	-
<b>Soil stability</b>	Qualitative/planning level assessment	No change	N	Maybe less stable	-	Maybe more stable	N
<b>Impacts to community resources<sup>1</sup></b>	Qualitative/planning level assessment	No change	N	No change	N	No change	N
<b>Impacts to natural resources<sup>2</sup></b>	Qualitative/planning level assessment	No change	N	Some impact	-	Some impact	-
<b>Farmland impacts</b>	Qualitative/planning level assessment	No change	N	Some impact	-	Some impact	-
<b>Visual impacts</b>	Qualitative/planning level assessment	No change	N	Some intrusion	-	Some intrusion	-
<b>Air quality impacts</b>	Assumed to correlate with congestion levels and total system travel distance	No change	N	Improved	+	Improved	+
<b>Noise impacts</b>	Assumed to correlate with traffic volumes on study segments	No change	N	Somewhat less	+	Somewhat less	+
<b>Cost</b>							
<b>Bridge Cost (\$ millions)</b>	Source: 2020 Hydraulics Analysis of South End Red River Bridge	N/A		\$30.0M		\$36.4M	
<b>Intersection Mitigation Cost (\$ millions)</b>	Planning-level Cost Estimate (least-cost mitigation) - plus or minus 20%	\$17.2M - \$25.8M		\$2.4M - \$3.6M		\$3.1M - \$4.7M	
<b>Total Planning Level Cost Estimate (\$ millions)</b>	Total of bridge and intersection mitigation costs	\$17.2M - \$25.8M		\$32.4M - \$33.6M		\$39.5M - \$41.4M	

<sup>1</sup>Community resources include environmental justice, historic and cultural resources, parks, open space, and recreational areas (note: impacts to Schools and the Greenway are evaluated separately)

<sup>2</sup>Natural resources include water bodies, wetlands, wildlife, floodplain, threatened and endangered species, non-invasive plants, soils, and trees