FARGO CITY COMMISSION AGENDA
Monday, December 11, 2023 – 4:00 P.M.

Executive Session at 4:00 p.m.

Roll Call.

PLEASE NOTE: The City Commission will convene at 4:00 p.m. and retire into Executive Session in the Red River Room for the purpose of attorney consultation regarding pending opioid litigation with McKinsey and Company, and to discuss Fargo Municipal Code Sections 10-0307- Persons Using Streets not to be Molested and 10-0311- Panhandling; to receive its attorneys' advice and guidance on the legal risks, strengths and weaknesses of an action of a public entity, which, to discuss these matters in public in an open meeting would have an adverse fiscal effect on the City. Thus, an Executive Session for these matters is authorized pursuant to North Dakota Century Code 44-04-19.1 subsections 2, 5 and 9.

Regular Meeting at 5:00 P.M.

City Commission meetings are broadcast live on TV Fargo Channel 56 and online at www.FargoND.gov/streaming. They are rebroadcast Mondays at 5:00 p.m., Thursdays at 7:00 p.m. and Saturdays at 8:00 a.m. They are also included in the video archive at www.FargoND.gov/citycommission.

A. Pledge of Allegiance.

B. Roll Call.

C. Approve Order of Agenda.

D. Minutes (Regular Meeting, November 27, 2023).

CONSENT AGENDA – APPROVE THE FOLLOWING:

1. Letter of Support for J & S Holdings, LLC project to the ND Opportunity Fund.

2. Amendment to Developer Agreement, Tax Increment Note, Certificate of Completion and Private Placement Memorandum with Wild Oak Group, LLC (Tax Increment Financing District 2020-01).

3. Application for Abatement or Refund of Taxes #4549 for property located at 2609 11th Street South requesting a reduction in value from $319,900.00 to $270,400.00; staff is recommending a reduction in value to $289,800.00 for 2023.

4. Findings, Conclusions and Order of the Board of City Commissioners of the City of Fargo regarding the License Violation of District 64.

5. Extension to Lease Agreement with Red River Properties, LLP for the Police Department Building.

6. 1st reading of an Ordinance Enacting Section 8-0610 of Article 8-06 of Chapter 8 of the Fargo Municipal Code Relating to Rotary Traffic Islands.

7. 1st reading of an Ordinance Amending Section 25-1508 of Article 25-15 of Chapter 25 of the Fargo Municipal Code Relating to Alcoholic Beverages.

8. 2nd reading and final adoption of an Ordinance Rezoning a Certain Parcel of Land Lying in Ekman Addition to the City of Fargo, Cass County, North Dakota; 1st reading, 11/27/23.

9. 2nd reading and final adoption of an Ordinance Rezoning Certain Parcels of Land Lying in Urban Plains by Brandt Seventh Addition to the City of Fargo, Cass County, North Dakota; 1st reading, 11/27/23.

10. 2nd reading and final adoption of an Ordinance Rezoning Certain Parcels of Land Lying in Timber Parkway Eighth Addition to the City of Fargo, Cass County, North Dakota; 1st reading, 11/27/23.

11. 2nd reading and final adoption of an Ordinance Rezoning Certain Parcels of Land Lying in Timber Parkway Tenth Addition to the City of Fargo, Cass County, North Dakota; 1st reading, 11/27/23.

12. Applications for Games of Chance:
    a. NDSU Saddle and Sirloin for a raffle on 2/10/24.
    b. NDSU Men's Lacrosse Club for a raffle on 3/15/24.
    c. The Outdoor Adventure Foundation, Inc. for a raffle and raffle board on 3/23/24.

13. Consent to Construct Agreement with 221 Main, LLC for property located at 221 Main Avenue.

14. Developer Agreement with Urban Plains Land Company, LLC for Urban Plains by Brandt Seventh Addition.

15. Negative Final Balancing Change Order No. 2 in the amount of -$135,314.00 and 31-day time extension to substantial and final completion dates for Project No. SR-23-A1.

16. Negative Final Balancing Change Order No. 1 in the amount of -$163,765.00 for Project No. SR-23-B1.

17. Negative Final Balancing Change Order No. 2 in the amount of -$71,174.60 for Project No. TM-23-A1.

18. Change Order No. 1 in the amount of $99,725.00 for Project No. FM-21-A2.

19. Bid advertisement for Project No. NR-24-A.

20. Bid award to Parsons Electric LLC in the amount of $927,349.00 for Project No. SL-23-B1.

21. Bid award to Northern Improvement Company in the amount of $346,494.03 for Project No. SN-23-B1.

22. Bid award to PCI Roads LLC in the amount of $536,628.71 for Project No. QR-24-A1.

23. Purchase Agreement, Sales Contract Addendum and Agreement Addendum Buyer's Conflict of Interest Disclosure with Wells Fargo Bank, N.A., as Trustee of the Jeffrey Donat Trust U/A (Improvement District No. BN-23-E1).

24. Create Improvement District No. TN-23-A (Traffic Signal Improvements).

25. Amended Engineer's Report for Improvement District No. BR-23-G.

26. Negative Final Balancing Change Order No. 6 in the amount of -$504,886.62 for Improvement District No. BN-22-C1.

27. Final Balancing Change Order No. 3 in the amount of $6,509.21 for Improvement District No. BN-22-F1.

28. Final Balancing Change Order No. 3 in the amount of $43,496.90 for Improvement District No. BR-23-C1.

29. Negative Final Balancing Change Order No. 2 in the amount of -$167,152.75 for Improvement District No. UN-23-A1.

30. Contract and bond for Improvement District No. BR-24-A1.

31. Master Services Agreements for Engineering/Architectural Services (RFP24010 and RFP24011).

32. Receive and file General Fund – Budget to Actual unaudited monthly financial statements through 11/30/23.

33. Resolutions Prescribing Rates and Charges for the Forestry Utility and the Street Lighting and Traffic Control Devices System Utility beginning on 1/1/24 as part of the 2024 budget.

34. First Amendment to the Joint Powers Agreement (Red River Regional Dispatch Center) with Cities of West Fargo and Moorhead, and the Counties of Cass and Clay.

35. Notice of Grant Award from the ND Department of Emergency Services for the FY 2023 State Homeland Security Program in the amount of $136,000.00 and related budget adjustments (CFDA #97.067).

36. Mutual Aid Agreement – Memorandum of Understanding with the City of Jamestown, ND Fire Department.

37. Bid award to Carr's Tree Service, Inc. in the amount of $144,899.00 for winter pruning operations (RFP24012).

38. Notice of Grant Award from the ND Department of Health and Human Services for the Regional Public Health Network and related budget adjustments. (CFDA #93.991).

39. City of Fargo Employment Policy Revisions, as presented.

40. Memorandum of Understanding with the Bureau of Alcohol, Tobacco, Firearms and Explosives Regarding the National Integrated Ballistic Information Network (NIBIN) system implementation.

41. Direct the City Attorney to draft an amendment to City Ordinance 8-0806 - Officer to Report.

42. Bid award to Sanitation Products in the amount of $598,674.00 for the purchase of two auto side load refuse trucks (RFP24014).

43. Bid award to Sanitation Products in the amount of $144,760.00 for the purchase of one container handler truck (RFP24015).

44. Bid award to Sanitation Products in the amount of $353,839.00 for the purchase of one high compaction front load refuse truck (RFP24016).

45. Purchase of eight Police Department Replacement Vehicles for 2024 from Nelsons Auto Center in the amount of $380,759.52 (PBC23376).

46. Final Balancing Change Order No. 5 in the amount of $60,145.19 for Project No. SW 22-01.

47. Memorandum of Understanding with the City of Moorhead Regarding Purchase of Software for the MATBUS Transit System.

48. Resolution Authorizing the Issuance and Sale of $6,400,000.00 City of Fargo Taxable Sales Tax and Water Revenue Bond and ND State Revolving Fund Program Loan Agreement with the ND Public Finance Authority for Project No. WA2255.

49. Bills.

REGULAR AGENDA:

50. RESIDENT COMMENTS (Fargo residents will be offered 2.5 minutes for comment with a maximum of 30 minutes total for all resident comments. Residents who would like to address the Commission, whether virtually or in person, must sign-up at FargoND.gov/VirtualCommission).

***Public Input Opportunity* - PUBLIC HEARINGS - 5:15 pm:**

51. **CONTINUE TO 1/8/24 - PUBLIC HEARING** - Application filed by John Deere Electronic Solutions, a Division of John Deere & Company, for a property tax exemption for a project to be located at 4101 19th Avenue North, which the applicant will use primarily for manufacturing and programming of receivers, displays, controllers, modems and inverters.

52. Application for Abatement or Refund of Taxes #4552 for property located at 2653 45th Street South requesting a reduction in value for 2023 from $2,378,000.00 to $1,100,000.00.

53. Discussion regarding the North Broadway Bridge (Project No. QR-23-A0).

54. Reconsideration of the City Commission's action taken on November 27, 2023 on the Public Hearing Appeal of a Board of Adjustment's decision regarding a Land Management Permit at 338 9th Avenue South, which was denied.

55. Recommendations for appointments to the Metro Flood Diversion Board of Authority and Committees.

56. Liaison Commissioner Assignment Updates.

People with disabilities who plan to attend the meeting and need special accommodations should contact the Commission Office at 701.241.1310. Please contact us at least 48 hours before the meeting to give our staff adequate time to make arrangements.

Minutes are available on the City of Fargo web site at www.FargoND.gov/citycommission.

THE CITY OF Fargo FAR MORE

52

ASSESSOR'S OFFICE
Fargo City Hall
225 4th Street North
Fargo, ND 58102
Phone: 701.241.1340 | Fax: 701.241.1339
www.FargoND.gov

December 1, 2023

Board of City Commissioners
City Hall
Fargo, ND 58102

Dear Commissioners:

Attached is the Application for Abatement or Refund of Taxes #4552. The application is for a fast food restaurant located at 2653 45 St S. The application requests the following:

#4552 – for 2023, a reduction from $2,378,000 to $1,100,000.

We have provided information regarding the valuation of this property and the reasons for a value adjustment. With the information provided by the owner and our staff appraiser's review, and based on the current condition of the property, we created new approaches to value and recommend value adjustments as provided below.

SUGGESTED MOTION:

Adjust the property values at 2653 45 St S in the following manner:
#4552 – reduce the 2023 certified value to $2,090,000

Sincerely,

Michael Sobolonskowski
Fargo City Assessor

Application For Abatement Or Refund Of Taxes

North Dakota Century Code § 57-23-04

File with the County Auditor on or before November 1 of the year following the year in which the tax becomes delinquent.

State of North Dakota **Assessment District** _____

County of Cass County **Property I.D. No.** 01-8533-00400-000

Name Cafe Holdings LLC **Telephone No.** _____

Address 2653 45 St S Fargo ND 58104

Legal description of the property involved in this application:

Lot: 4 Block: 1 Addition: Urban Plains Northeast Retail
2nd Addition Additional: URBAN PLAINS
NORTHEAST RETAIL 2ND ADDN LT 4

Total true and full value of the property described above for the year 2023 **is:**

Land	$ 511,000
Improvements	$ 1,867,000
Total	$ 2,378,000 (1)

Total true and full value of the property described above for the year 2023 **should be:**

Land	$ 511,000
Improvements	$ 589,000
Total	$ 1,100,000 (2)

The difference of $ 1,278,000.00 **true and full value between (1) and (2) above is due to the following reason(s):**

- ☐ 1. Agricultural property true and full value exceeds its agricultural value defined in N.D.C.C. § 57-02-27.2
- ☑ 2. Residential or commercial property's true and full value exceeds the market value
- ☐ 3. Error in property description, entering the description, or extending the tax
- ☐ 4. Nonexisting improvement assessed
- ☐ 5. Complainant or property is exempt from taxation. Attach a copy of Application for Property Tax Exemption.
- ☐ 6. Duplicate assessment
- ☐ 7. Property improvement was destroyed or damaged by fire, flood, tornado, or other natural disaster (see N.D.C.C. § 57-23-04(1)(g))
- ☐ 8. Error in noting payment of taxes, taxes erroneously paid
- ☐ 9. Property qualifies for Homestead Credit (N.D.C.C. § 57-02-08.1) or Disabled Veterans Credit (N.D.C.C. § 57-02-08.8). Attach a copy of the application.
- ☐ 10. Other (explain) _____

The following facts relate to the market value of the residential or commercial property described above. For agricultural property, go directly to question #5.

1. Purchase price of property: $ 1,184,926 Date of purchase: 3/16/14
   Terms: Cash ✓ Contract _____ Trade _____ Other (explain) _____
   Was there personal property involved in the purchase price? NO (yes/no) Estimated value: $ _____
2. Has the property been offered for sale on the open market? NO (yes/no). If yes, how long? _____
   Asking price: $ _____ Terms of sale: _____
3. The property was independently appraised: YES (yes/no) Purpose of appraisal: Value for Loan
   Integra Realty Resources Market value estimate: $ 2,080,000
   Appraisal was made by whom? _____
4. The applicant's estimate of market value of the property involved in this application is $ 1,100,000
5. The estimated agricultural productive value of this property is excessive because of the following condition(s): _____

Applicant asks that the Auditor reassess the value of the property as the assessed value is projected to jump 170% from previous year. Based on an income approach and four comparable properties on 45th St, our assessed value recommendation would be $1,100,000, which represents a 25% increase.

By filing this application, I consent to an inspection of the above-described property by an authorized assessment official for the purpose of making an appraisal of the property. I understand the official will give me reasonable notification of the inspection. See N.D.C.C. § 57-23-05.1.

I declare under the penalties of N.D.C.C. § 12.1-11-02, which provides for a Class A misdemeanor for making a false statement in a governmental matter, that this application is, to the best of my knowledge and belief, a true and correct application.

_____ 9/27/23 _____ 9/27/23
Signature of Preparer (if other than applicant) Date Signature of Applicant Date

24775
(2-2016)

Recommendation of the Governing Body of the City or Township

Recommendation of the governing board of _____

On _____, _____, the governing board of this municipality, after examination of this application and the facts, passed a resolution recommending to the Board of County Commissioners that the application be _____

_____

_____

_____

Dated this _____ day of _____, _____.

_____
City Auditor or Township Clerk

Action by the Board of County Commissioners

Application was _____ by action of _____ County Board of Commissioners.
Approved/Rejected

Based upon an examination of the facts and the provisions of North Dakota Century Code § 57-23-04, we approve this application. The taxable valuation is reduced from $ _____ to $ _____ and the taxes are reduced accordingly. The taxes, if paid, will be refunded to the extent of $ _____. The Board accepts $ _____ in full settlement of taxes for the tax year _____.

We reject this application in whole or in part for the following reason(s). Written explanation of the rationale for the decision must be attached. _____

_____

_____

_____

Dated _____, _____

_____
County Auditor

_____
Chairperson

Certification of County Auditor

I certify that the Board of County Commissioners took the action stated above and the records of my office and the office of the County Treasurer show the following facts as to the assessment and the payment of taxes on the property described in this application.

Year	Taxable Value	Tax	Date Paid (if paid)	Payment Made Under Written Protest?
				yes/no

I further certify that the taxable valuation and the taxes ordered abated or refunded by the Board of County Commissioner are as follows:

Year	Reduction in Taxable Valuation	Reduction in Taxes

_____ _____
County Auditor Date

Application For Abatement Or Refund Of Taxes

Name of Applicant Cafe Holdings LLC

County Auditor's File No. 4552

Date Application Was Filed With The County Auditor 11/3/2023

Date County Auditor Mailed Application to Township Clerk or City Auditor 11/3/2023
(must be within five business days of filing date)

Café Holdings - Valuation

Parcel : 01853300400000

Comparable Properties

Apartment	Year Built	SF of Building	Location	Parcel #	2021 Assessed Value	2022 Assessed Value	2023 Assessed Value	Price/SF	2021 - 2022 Δ	2022 - 2023 Δ
Café Holdings	2013	4,174	Fargo	01853300400000	1,401,600	881,000	[illegible]	570	-37%	170%
Shoppes on 45th	2009	7,548	Fargo	01839900030030	1,379,200	1,517,100	1,585,000	210	10%	4%
Famous Daves	2002	5,852	Fargo	01557000400000	1,040,300	1,040,300	1,167,900	200	0%	12%
Applebees	2007	7,394	Fargo	01839100020000	1,920,200	1,920,200	2,141,200	290	0%	12%
The Tavern Grill	2017	8,568	Fargo	01867300100000	2,694,000	2,694,000	2,914,800	340	0%	8%

Café Holdings					
Valuation #1	Comparable Properties Value	$ 1,085,240	$ 260	Price/SF	
Valuation #2	Income- Approach Value	$ 1,157,973	$ 86,848		7.5% Cap Rate
	Recommended 2023 Assessed Value	$ 1,100,000			

Freddy's Restaurant

Parcel Number: 01-8533-00400-000

2653 45 St S

Owner: Café Holdings, LLC

Appeal of Assessment for Year: 2023

Name of Applicant: Phil Abeln

Assessed Value (2023 Tax Year)	2,378,000	
Applicants Requested Value(s)	1,100,000	-54%
General Property Information		
Property Type	Quick Service Restaurant	
Year Built	2013	
Year Remodeled	2022	
Building Area	4,174 sf	*569.72 / sf*
Land Area	39,330 sf	*12.99 / sf*
Fargo Assessor Recommendation	2,090,000	-12%

Summary

Appellant is requesting a reduction of -1,278,000 or 53.7%. The appellant provided financial statements, a list of assessed values they felt as comparable, and a rudimentary leased-fee income approach based on those comparable properties. The appellant indicates that the property was recently appraised for financing purposes. He indicated that appraisal estimated a value of 2,080,000.

The subject property is a quick service restaurant (fast food). Built in 2013, the subject was originally a multi-tenant restaurant. An extensive renovation occurred in 2022, which converted the subject to its current occupancy. Assessment department staff valued the remodeling work for 2023, after recognizing a partial value for the 2022 tax year. All single tenant quick service restaurants were re-appraised for the 2022 tax year. The 2022 quick service restaurant reappraisal was completed using Marshall Valuation Service, adjusting for sale prices of the inventory.

City staff viewed the property on 11/08/2023. Staff adjusted the effective age (condition) and added value for fire suppression, which was omitted from the record card and required in the cost approach. Staff then estimated the value with three approaches. The indicated value range is between $1,875,000 (income approach) and $2,378,000 (sales comparison approach). Our quick service value model indicates a value of $2,090,000.

We do not support the appellant's requested value for several reasons. The requested value would create equalization problems relative to other quick service restaurants. The value would be 47% lower than the appellants own independent fee appraisal, and lower than the indicated purchase price from 2014 ($1,184,926). Finally, we feel that our recommended value is supported by the market, and equalized with its quick service restaurant peers.

Comparable Sales Summary

Address	Building Name	Property Type	Size (SF)	Year Built	Sale Date	Sale Price (*Contract*)	Sale Price (*Adj. for SPUN & Lease in Place*)	$/SF
4480 26 AVE S	Starbucks	Food Service (Quick)	2,545	2017	05/2023	2,000,000	1,559,000	613
1599 19 AVE N	Taco Bell	Food Service (Quick)	2,665	2009	12/2020	1,960,000	1,475,400	554
1212 36 ST S	Burger King	Food Service (Quick)	4,343	1975	04/2020	2,750,000	2,067,200	476
1415 42 ST S	Arby's	Food Service (Quick)	3,051	1984	03/2023	1,621,000	1,218,450	399
Subject	Freddy's	Food Service (Quick)	4,174	2013	Original 2023 True & Full		2,378,000	570
					Appellants Requested Value		1,100,000	264
					Proposed Value		2,090,000	501

Information provided above is a summary of the analysis conducted. Full analysis is provided in the Assessment Department's work file.

Freddy's Restaurant

Parcel Number: 01-8533-00400-000

2653 45 St S

Owner: Café Holdings, LLC

Competing Properties (Assessed Values) Summary

We studied current assessments of similar properties for equalization. The search parameters are all single tenant quick service restaurants in the 45th St S and Veteran's Blvd corridors. We filtered the data for restaurants constructed between 2008 and 2018. There are eleven such properties.

The proposed value would sit just below the median price on both units of comparison. The requested value would be below the minimum value on both units of comparison.

	Improvement	Total Value	$/SF Improvement	$/SF Total
Maximum	1,895,300	2,640,800	465	709
90th Percentile	1,678,800	2,189,300	459	676
75th Percentile	1,172,650	1,684,750	449	624
Median	1,075,400	1,590,800	387	533
25th Percentile	1,033,750	1,379,750	373	483
10th Percentile	900,000	1,142,400	365	422
Minimum	692,400	1,049,000	188	291
2023 True & Full	1,867,000	2,378,000	447	570
Requested Value	589,000	1,100,000	141	264
Proposed Value	1,579,000	2,090,000	378	501

Recommended Action: Adjust the true and full value to $2,090,000 for the 2023 tax year.

Information provided above is a summary of the analysis conducted. Full analysis is provided in the Assessment Department's work file.

THE CITY OF Fargo
FAR MORE

53

Engineering Department
225 4th Street North
Fargo, ND 58102
Phone: 701.241.1545 | Fax: 701.241.8101
Email feng@FargoND.gov
www.FargoND.gov

December 7, 2023

Honorable Board of
City Commissioners
225 4th Street North
Fargo, ND 58102

Re: Request for Project Decision
North Broadway Bridge Feasibility Study
City of Fargo Project No. QR-23-A0

Dear Commissioners:

Attached you will find the Final Feasibility Study for the North Broadway Bridge, which contains the additional information regarding Benefit Cost Analysis as part of the study, a second attachment which contains the results of the survey that we solicited in early November, and finally, a third attachment titled 'North Broadway Bridge Decision Document' for this project.

To recap, there are 3 options that we evaluated as part of the study:

- Option 1: Replace the bridge at the same elevation.
- Option 2A: Replace the bridge higher than the 100-year flood event elevation and connect into 37th Avenue North.
- Option 2B: Replace the bridge higher than the 100-year flood event elevation and connect into Royal Oaks Drive North.
- Option 3: Do not replace the bridge.

The study was discussed at PWPEC on November 20, 2023, and much of the discussion centered around the financial feasibility of any 'Build' alternative under the current funding plan. PWPEC did not pass a motion on the study.

The Clay County Board met on November 21, 2023 to discuss the study and while they didn't pass a motion in regards to the project, they did discuss the current financing plan and the fact that they can't support it as shown. In their discussions, they did support Option 1, but did not commit to a financing plan at their meeting.

All of the analysis to date comes down to two main questions: 1) Does the City support one of the 'Build' options, and if so, 2) How does the City pay for the project?

If the decision is to support one of the 'Build' options, it appears the current cost splits and proposed financing plan are not supported by Clay County. Therefore, an alternative financing plan would need to be developed. Currently, a bridge replacement project for North Broadway is slated to receive $5.4 million in calendar year 2026 as part of the FM Metro COG Transportation Improvement Program (TIP). Potential options for funding are outlined further in the decision document.

Recommended Motion

None at this time. Staff will be presenting a slideshow to address the questions posed by the City Commission at the October 30, 2023, meeting. After providing additional information and allowing Commissioners sufficient time for review, we will be seeking a decision from the City Commission on December 26, 2023.

Sincerely,

Tom Knakmuhs, PE
City Engineer

Attachments:
Final Feasibility Study
Public Survey Results
North Broadway Bridge Decision Document

North Broadway Bridge Decision Document

1. Which of the following option(s) is supported?

   _____ Option 1 – Reconstruct at similar elevation

   _____ Option 2a – Reconstruct above future 100-yr floodplain on similar alignment

   _____ Option 2b – Reconstruct above future 100-yr floodplain and re-align to Royal Oaks Drive North

   _____ Option 3 – Do not reconstruct the bridge, direct Engineering to install permanent traffic calming measures on 10th Street North, and request FM Metro COG to remove the project from the TIP and reallocate funding to other STBG eligible projects

2. If Option 1, 2a or 2b is selected, which funding option is preferred?

   _____ Request FM Metro COG move this project from 2026 to 2027 in the TIP, move the 17th Ave S reconstruction project from 2027 to 2026, and direct City staff to work with Clay County to pursue potential alternative funding sources.

   _____ Request FM Metro COG move this project from 2026 to 2028 in the TIP, move the 17th Ave S reconstruction project from 2027 to 2026, and direct City staff to work with Clay County to pursue potential alternative funding sources.

   _____ Request FM Metro COG remove this project entirely from the TIP at this time, move the 17th Ave S reconstruction project from 2027 to 2026, and direct City staff to work with Clay County to pursue potential alternative funding sources for reconstruction in 2029 or later.

   _____ Utilize $5.4M in programmed Federal Funds for reconstruction in 2026 and reduce the Engineering CIP to fund the preferred option (amount of reduction would be based on the amount of Clay County's participation).

Comments:

_____

_____

_____

_____

_____ Date: _____

Dr. Timothy J. Mahoney, Mayor

NORTH BROADWAY BRIDGE SURVEY

Friday, November 24, 2023

1301

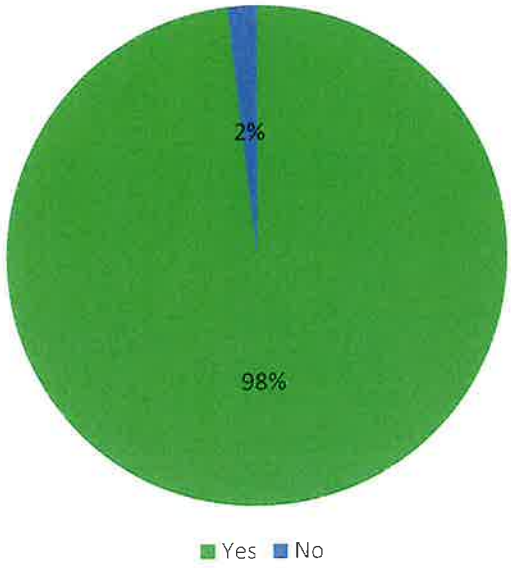
Total Responses

Date Created: Tuesday, November 07, 2023

Complete Responses: 1301

Q1: Are you a Fargo resident?

Answered: 1301 .: 0



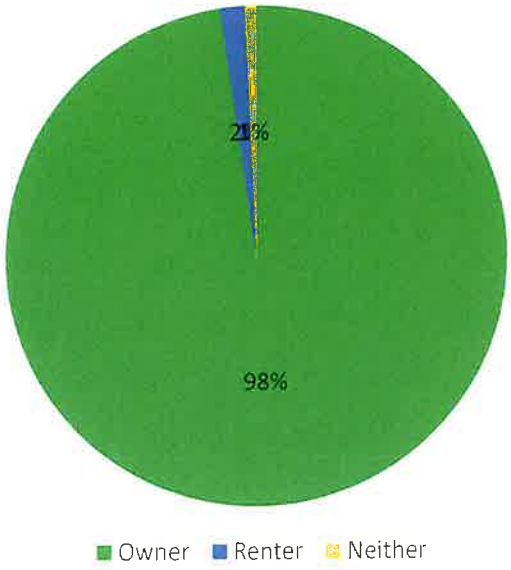
Q1: Are you a Fargo resident?

Answered: 1301 .: 0

ANSWER CHOICES	RESPONSES	
Yes	98.16%	1277
No	1.84%	24
TOTAL		1301

Q2: What best describes your current residential situation?

Answered 1301 : 0



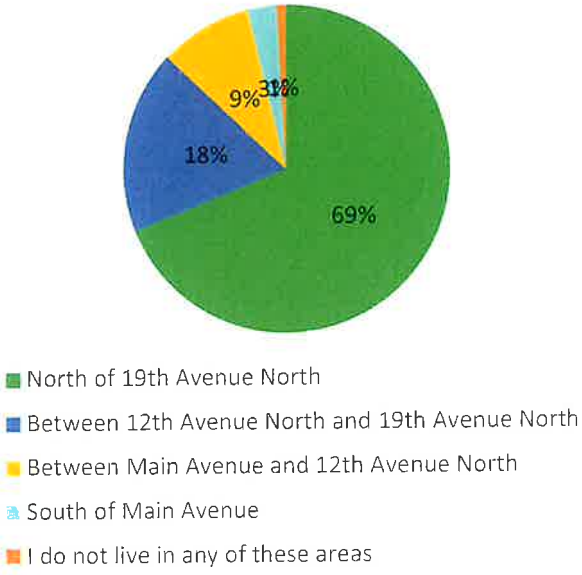
Q2: What best describes your current residential situation?

Answered 1301 : 0

ANSWER CHOICES	RESPONSES	
Owner	97.62%	1270
Renter	1.69%	22
Neither	0.69%	9
TOTAL		1301

Q3: Which of the following best describes where you live?

Answered: 1301 : 0



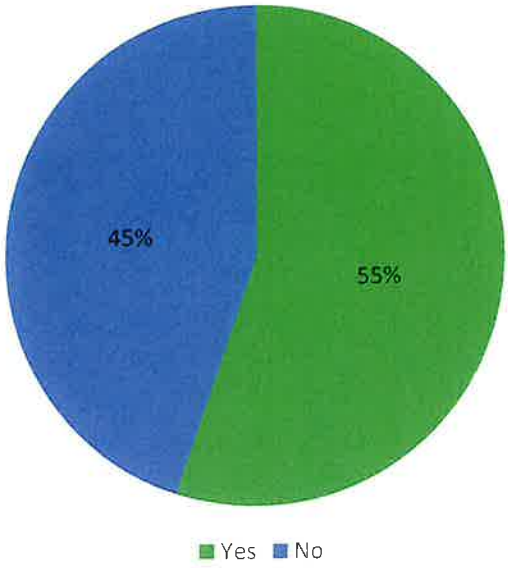
Q3: Which of the following best describes where you live?

Answered: 1301 : 0

ANSWER CHOICES	RESPONSES	
North of 19th Avenue North	68.95%	897
Between 12th Avenue North and 19th Avenue North	18.06%	235
Between Main Avenue and 12th Avenue North	9.22%	120
South of Main Avenue	2.92%	38
I do not live in any of these areas	0.85%	11
TOTAL		1301

County and has been closed since February 2021. Do you feel impacted by the removal of the North Broadway Bridge?

Answered: 1301 .: 0



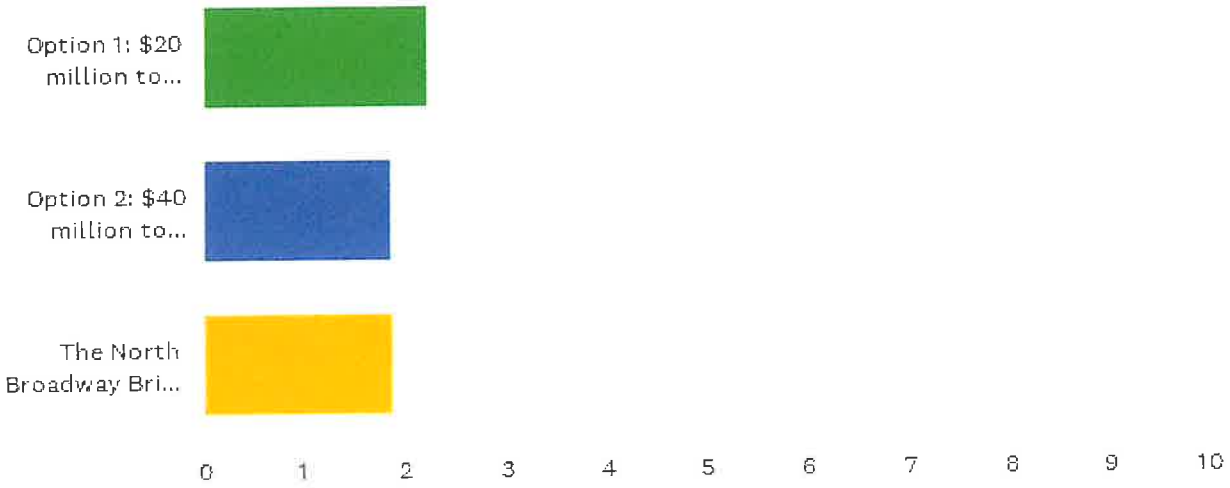
County and has been closed since February 2021. Do you feel impacted by the removal of the North Broadway Bridge?

Answered: 1301 .: 0

ANSWER CHOICES	RESPONSES	
Yes	55.11%	717
No	44.89%	584
TOTAL		1301

ultimately selected. Please rank the following options for your preferred path on which you would like to see The City of Fargo undertake:

Answered: 1301 : 0



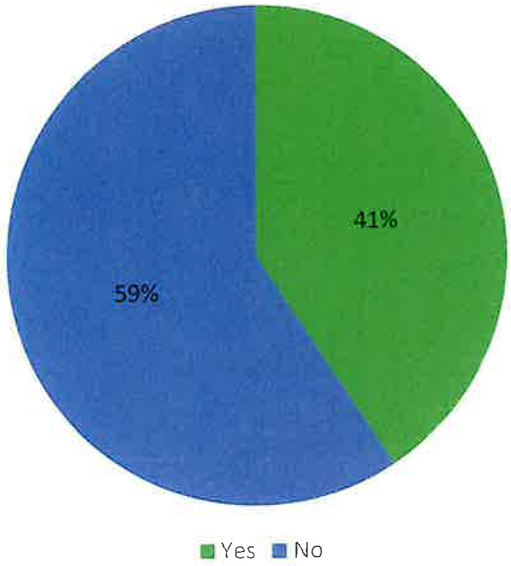
ultimately selected. Please rank the following options for your preferred path on which you would like to see The City of Fargo undertake:

Answered: 1301 : 0

	1	2	3	TOTAL	SCORE
Option 1: $20 million to rebuild the bridge as it had previously existed (would be impacted by flood waters).	34.20% 445	55.27% 719	10.53% 137	1,301	2.24
Option 2: $40 million to rebuild the bridge above the future floodplain (would not flood post-Diversion).	27.67% 360	32.36% 421	39.97% 520	1,301	1.88
The North Broadway Bridge does not need to be reconstructed (With this option, The City would implement measures to reduce and calm traffic on 10th Street North.	38.12% 496	12.38% 161	49.50% 644	1,301	1.89

funded through special assessments. Would you be willing to pay for a portion of the reconstruction costs through special assessments?

Answered: 1301 : 0



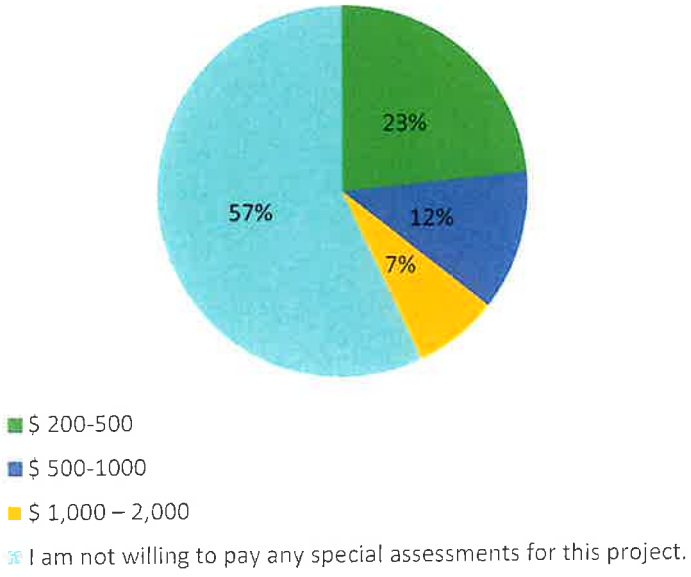
funded through special assessments. Would you be willing to pay for a portion of the reconstruction costs through special assessments?

Answered: 1301 : 0

ANSWER CHOICES	RESPONSES	
Yes	40.74%	530
No	59.26%	771
TOTAL		1301

Q7: If you are willing to pay special assessments for this project, what price range are you comfortable being assessed over a 25-year period?

Answered: 1301 : 0



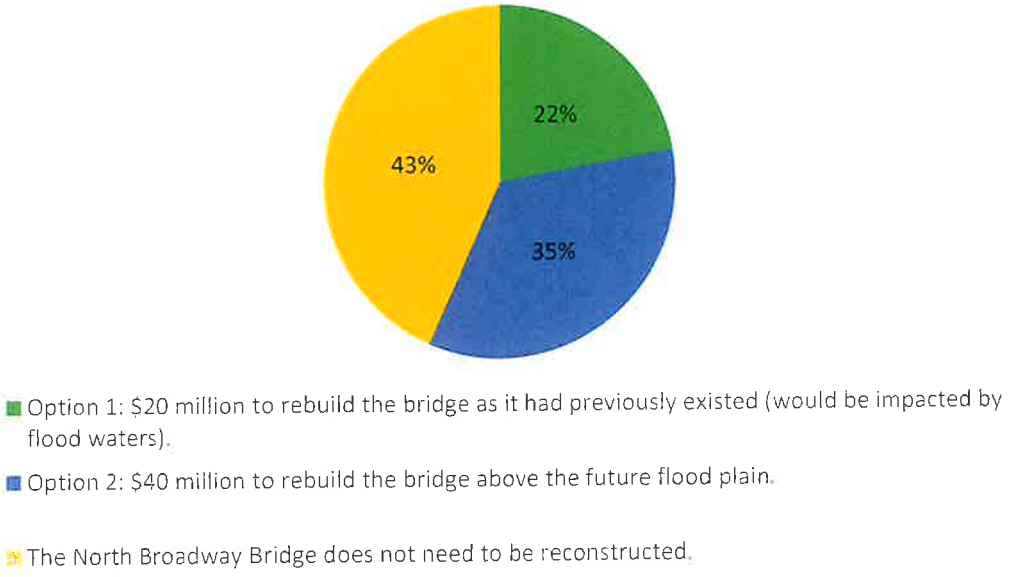
Q7: If you are willing to pay special assessments for this project, what price range are you comfortable being assessed over a 25-year period?

Answered: 1301 : 0

ANSWER CHOICES	RESPONSES	
$ 200-500	23.44%	305
$ 500-1000	12.22%	159
$ 1,000 – 2,000	7.38%	96
I am not willing to pay any special assessments for this project.	56.96%	741
TOTAL		1301

than $500 payable over 25 years. Which of the following options would you be willing to consider?

Answered: 1301 : 0



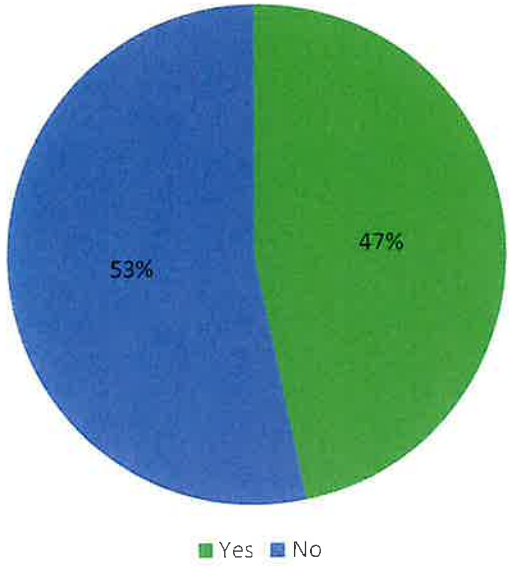
than $500 payable over 25 years. Which of the following options would you be willing to consider?

Answered: 1301 : 0

ANSWER CHOICES	RESPONSES	
Option 1: $20 million to rebuild the bridge as it had previously existed (would be impacted by flood waters).	22.14%	288
Option 2: $40 million to rebuild the bridge above the future flood plain.	34.51%	449
The North Broadway Bridge does not need to be reconstructed.	43.35%	564
TOTAL		1301

reconstruct the 12th Avenue North Bridge to elevate it out of the future floodplain (would not flood post-Diversion)?

Answered: 1301 .: 0



reconstruct the 12th Avenue North Bridge to elevate it out of the future floodplain (would not flood post-Diversion)?

Answered: 1301 .: 0

ANSWER CHOICES	RESPONSES	
Yes	46.73%	608
No	53.27%	693
TOTAL		1301

City of Fargo

225 4th Street North
Fargo, ND 58102

November 14, 2023

North Broadway Bridge Feasibility Report

HOUSTON engineering, inc.

1401 21st Avenue N, Fargo, ND 58102 | Ph. (701) 237-5065

www.houstoneng.com

Table of Contents

Appendices

List of Figures

List of Tables

List of Acronyms, Abbreviations, Units

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AEP	Annual Exceedance Probability
APE	Area of Potential Affect
ASTM	American Society for Testing and Materials
BCA	Benefit-Cost Analysis
BDR	Basis of Design Report
BFE	Base Flood Elevation
BMP	Best Management Practice
Braun Intertec	Braun Intertec, Inc.
CADD	Computer-aided Drafting and Design
CSAH	County State Aid Highway
cfs	Cubic feet per second
CMP	Corrugated Metal Pipe
DEM	Digital Elevation Model
DTM	Digital Terrain Model
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESSA	Effective Stress Stability Analysis
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIS	Flood Insurance Survey
GIS	Geographic Information System
HEI	Houston Engineering, Inc.
HPTRM	High Performance Turf Reinforcement Mat
HTRW	Hazardous, Toxic and Radioactive Waste
kcf	Kilopounds per cubic foot
ksi	Kilopounds per square inch
LiDAR	Light Detection and Ranging
MDE	Multiple Discrete Events
mm/s	millimeters per second
NAD	North American Datum
NAVD	North American Vertical Datum
NEC	National Electrical Code

NED	National Elevation Data
NDDEQ	State of North Dakota Department of Environmental Quality
NDDOT	North Dakota Department of Transportation
NDDWR	North Dakota Department of Water Resources
NDGF	State of North Dakota Department of Game and Fish
NDPDES	North Dakota Pollutant Discharge Elimination System
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NGVD	National Geodetic Vertical Datum
NLCD	National Land Cover Database
NRCS	National Resources Conservation Service
NWI	National Wetlands Inventory
NWS	National Weather Service
O&M	Operations and Maintenance
OHWM	Ordinary High-Water Mark
OMB	Office of Management and Budget
pcf	Pounds per cubic foot
PER	Preliminary Engineer's Report
PL	Public Law
PLC	Programmable Logic Controller
psi	Pounds per square inch
PROWAG	Public Right-of-Way Accessibility Guidelines
PWI	Public Waters Inventory
RCP	Reinforced Concrete Pipe
SCADA	Supervisory Control and Data Acquisition
SHPO	State Historic Preservation Office
SSURGO	Soil Survey Geographic Database
SWCD	Soil Water Conservation District
SWPPP	Stormwater Pollution Prevention Plan
USACE	US Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service or U.S. Department of the Interior, Fish and Wildlife Service
USGS	United States Geologic Survey
USNWR	U.S. National Wildlife Refuge
USSA	Undrained Strength Stability Analysis

WCA	Wetland Conservation Act
WRDA	Water Resource Development Act
WSS	Web Soil Survey
WTP	Water Treatment Plant
XP-SWMM	XP

Executive Summary

1. Introduction

Bridge No. 14524 (Minnesota) or 0000FRGO12 (North Dakota) was built in 1990 through a Clay County contract. During the initial life of the structure, geotechnical instability along the north embankment of the river and channel bottom caused forces on the bridge that resulted in movement and tilting of the bridge substructures, namely the northern pier and north abutment. In 2000, Clay County completed a project to remediate the pier and abutment movement by utilizing brackets and hanger assemblies. The bridge was on a regular inspection cycle and exhibited continued movement.

The bridge is frequently overtopped during times of flooding. According to records from the City of Fargo, at this location the Red River has exceeded the flood stage of 23 feet a total of 608 days since 1907. In addition, the bridge has flooded 17 times since 1991 during spring melting with an average closure duration of 18.3 days and an additional 15 times due to excessive rainfall events with an average closure duration of 7.6 days.

A bridge engineer inspected the bridge on February 10, 2021, and recommended the bridge be closed to the public due to significant tilting of the northern pier. The bridge was closed to the public on February 11, 2021. After the closure, traffic was forced to find alternate routes. This resulted in approximately 2,650 vehicles per day utilizing alternate adjacent routes.

The City of Fargo desired resolution to the question regarding replacement of the bridge, and if so, what height should the replacement bridge be. A feasibility study was determined to be the most prudent level of analysis to evaluate the options based on set comparison criteria. This would allow a high-level assessment to be utilized by the City Commission and Clay County to make decisions on the appropriate path forward. This study generally encompasses a high-level analysis of various criteria to determine the overall possibility of options being feasible based on environmental, technical, and financial analysis.

2. Options and Feasibility Criteria

Four options were considered for this study:

- Option 1 – Replace the bridge with a new structure at an elevation very similar to the previous structure and reconstruct the road to the south moving it west to avoid the existing geotechnical stability issues along the river. This option will also require a retaining wall to reduce fill and the risk of continued geotechnical failures.
- Option 2A – Replace the bridge with a structure with the low member above the proposed 100-year river level post-F-M Diversion construction. This option would also raise the roadway above the 100-year level to safely pass traffic during flooding at or below this event.
- Option 2B – The same as Option 2A except that the road would “tie in” at the existing cul-de-sac at Royal Oaks Drive. The roadway will be dry during the 100-year river level as with option 2A. The existing levee system around the neighborhood would be realigned to maintain the current level of protection.
- Option 3 –This option does not replace the bridge over the Red River and will permanently detour traffic around the site. This option will require obliterating the existing road and preparing it for permanent closure. In addition, traffic calming measures will be required at 10th Street North to reduce traffic.

To properly compare the Options, criteria were established to evaluate the options based on priorities for the project and the owners. Eight criteria were established for evaluation of the various options, which include:

- Vehicular and Pedestrian Mobility
- Geotechnical Risk
- Hydraulic Impacts
- Property Impacts
- Property Acquisition
- Permitting
- Clay County Preference
- Construction Costs

While these criteria do not encompass every difference between the options, they do give a general sense of risk and functionality for each option and are critical for input into the overall Benefit-Cost Analysis (BCA) used to further evaluate the options.

3. Feasibility Performance

The overall performance of each option relative to the feasibility criteria are available in the main body of the report. However, a matrix was developed to identify performance of the options more easily relative to the criteria established.

Table 1. North Broadway Bridge Replacement Option Comparison

North Broadway Bridge Replacement Option Comparison				
Options				
	Option 1	Option 2a	Option 2b	Option 3
Evaluation Criteria	Bridge at Existing Elevation	Bridge above 100-yr Existing Alignment	Bridge above 100-yr to Cul-de-sac	No Replacement
Impact/Benefit				
Vehicular and Pedestrian Mobility				
Geotechnical Risk				
Hydraulic Impacts				
Property Impacts				
Property Acquisition				
Permitting				
Clay County Preference				
Construction Costs				
B/C Analysis				
Estimated Construction Costs	**$15,225,000**	**$25,891,000**	**$34,696,000**	**$579,000**
Total Construction Costs with Fees and Engineering	**$20,333,000**	**$36,865,000**	**$46,400,000**	**$817,000**

Favorable
Moderate
Poor

4. Financial Feasibility

An important process in any planning application is to quantify the benefits of an alternative and weigh them against the costs. Often, projects are advanced to construction without consideration to the public's return on their investment. This process, referred to as BCA, is a systemic approach of identifying, quantifying, and comparing construction, maintenance, and other related costs to expected benefits.

It is recognized that many factors are given consideration when determining whether to move forward with a project or not. The BCA can be used as a starting point for the decision-making process.

A summary of the BCA is shown below in **Table 2**. The net present value of the benefits and costs are shown for 2023 dollars. The net benefits are presented as either a positive number indicating the benefits outweigh the costs or a negative value indicating the costs outweigh the benefits. Generally, a positive net benefit indicates that the option would warrant additional consideration. Options resulting in a negative net benefit may also warrant consideration due to the level of analysis and variability when projecting current and future costs during times of high inflation. The footnotes below **Table 2** provide a summary of the items considered in the net present value of benefits and costs for the various options. (See Section 4.0 for additional information)

Table 2. Benefit-Cost Analysis Summary

Benefit-Cost Analysis Summary					
	Option				
Calculation	Option 1 (1)	Option 2A (1)	Option 2B (1)	Option 3 (2)	
Net Present Value of Benefits (PV_B)	$19,467,793	$19,467,793	$19,467,793	$13,992,658	(A)
Net Present Value of Costs (PV_C)	$13,992,658	$24,291,061	$30,564,505	$20,108,283	(B)
Net Benefits	$5,475,135	$(4,823,268)	$(11,096,712)	$(6,115,625)	(A)-(B)
Summary	Benefits Outweigh Costs	Costs Outweigh Benefits	Costs Outweigh Benefits	Costs Outweigh Benefits	

(1) Net Present Value of Benefits include reduced user delay (travel time), user operating costs, and greenhouse gas emissions.

Net Present Value of Costs include applicable roadway and bridge construction, right of way/property acquisition, engineering and other fees, and future maintenance costs.

(2) Net Present Value of Benefits calculated as the cost savings of electing to not construct a new bridge as compared to Option 1.

Net Present Value of Costs include roadway and traffic calming construction, engineering and other fees, and maintenance costs as well as increased user delay (travel time), user operating costs, and greenhouse gas emissions.

1. Introduction

North Broadway Drive in the City of Fargo is an urban minor arterial that extends north from the intersection of Broadway and 37th Avenue North to an intersection at the north end with 40th Avenue Northwest (Fargo)/CSAH 22 (Clay County). The length of the roadway is approximately 3,300 feet and parallels the Red River of the North for the first 1,600 feet north of Broadway and then crosses the Red River into Minnesota (County Highway 1) before it intersects CSAH 22 (See **Figure 1** below for project location).

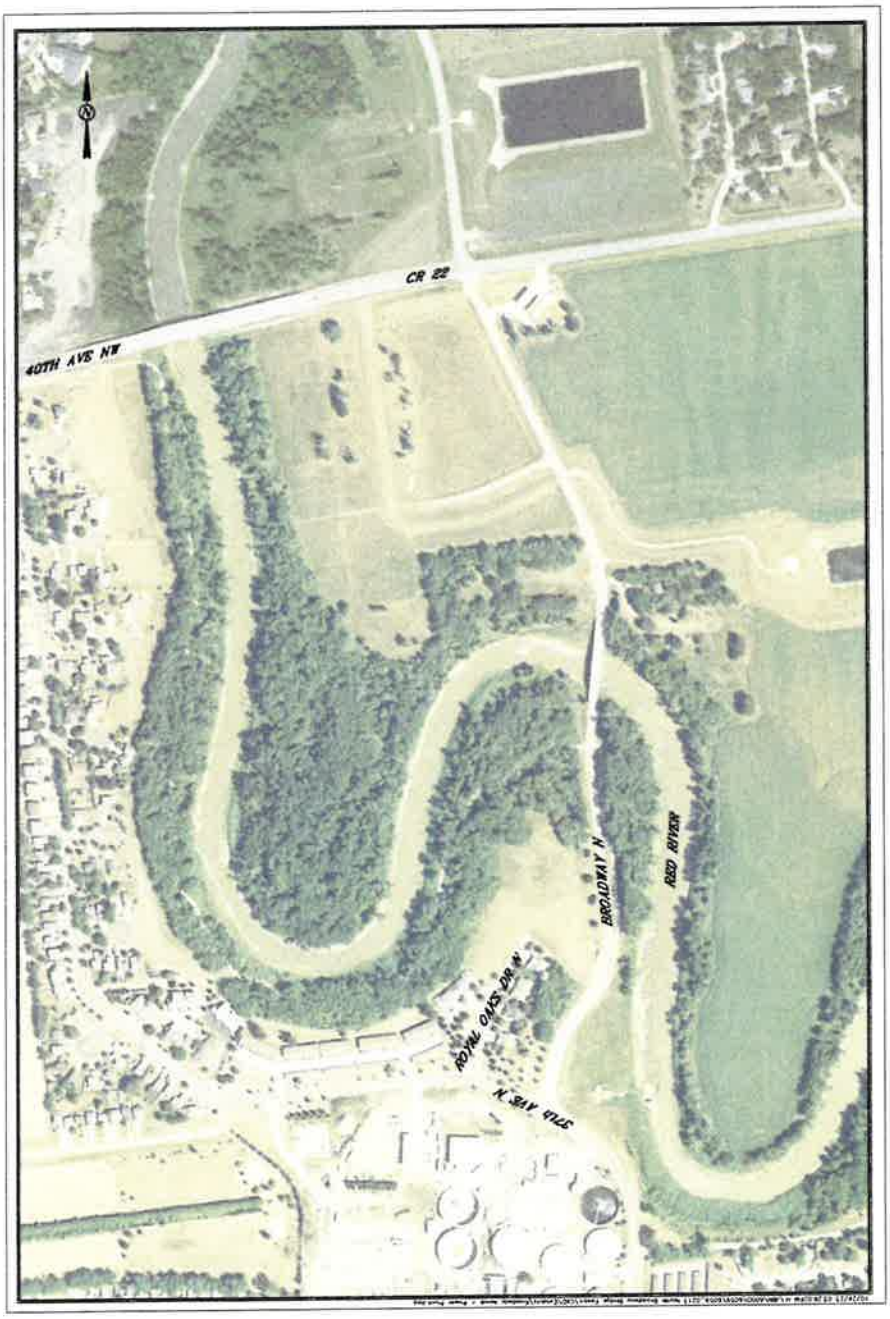


Figure 1. Project Location

For the purposes of this report, the study area was limited from 37th Avenue North to the residence driveway located just north of the bridge over the Red River (See **Figure 2**).

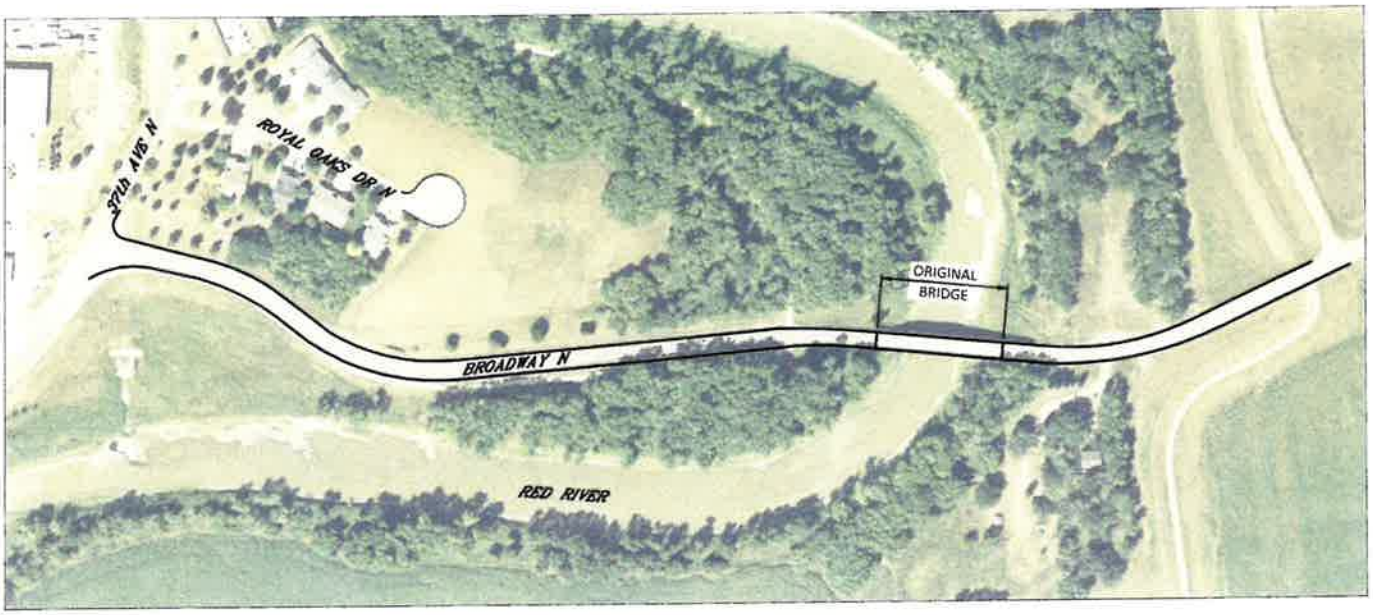


Figure 2. Project Study Area

1.1 Bridge History

Bridge No. 14524 (Minnesota) or 0000FRGO12 (North Dakota) was built in 1990 through a Clay County contract. The bridge was a three-span prestressed concrete girder bridge with a length of 310 feet. The clear width of the bridge deck was 32 feet. During the initial life of the structure, geotechnical instability along the north embankment of the river and channel bottom caused forces on the bridge that resulted in movement and tilting of the bridge substructures, namely the northern pier and north abutment. In 2000, Clay County completed a project to remediate the pier and abutment movement by utilizing brackets and hanger assemblies. The bridge was on a regular inspection cycle and exhibited continued movement.

In addition to the geotechnical complexities, the bridge is frequently overtopped during times of flooding. According to records from the City of Fargo, the Red River has exceeded the flood stage of 23 feet a total of 608 days since 1907 at this location. In addition, the bridge has flooded 17 times since 1991 during spring melting with an average closure duration of 18.3 days and an additional 15 times due to excessive rainfall events with an average closure duration of 7.6 days.

In November of 2020 an inspection resulted in a substructure condition rating of 2 and an overall bridge rating of "poor." A bridge engineer inspected the bridge again on February 10, 2021, and recommended the bridge be closed to the public due to significant tilting of the northern pier. The bridge was closed to the public on February 11, 2021.

The Fargo City Commission voted on November 15, 2021, to apply for federal aid to replace the bridge in construction year 2026. In addition, they voted to approve the 2022 capital improvement program that included funding for demolishing the existing bridge. This vote occurred on November 19, 2021, and was necessitated by concern for the public with the deteriorating bridge and continued movement. The bridge was removed in 2021.

Houston Engineering, Inc. (HEI) was retained by the City of Fargo in June of 2023 to complete a study to determine the feasibility of various options, including multiple options for replacement and an option to not replace the bridge and leave the road closed permanently.

1.2 Purpose and Need

Purpose: Determine the feasibility of various options to restore operations in the study area. Options include replacing the bridge at various elevations and leaving the site as-is with no new bridge while implementing additional traffic calming measures. The options were evaluated based on various feasibility factors outlined below as well as a BCA for each option.

Need: After the closure of the North Broadway crossing of the Red River in 2021, traffic was forced to find alternate routes. This resulted in approximately 2,650 vehicles per day utilizing alternate adjacent routes. A feasibility study was determined to be the most prudent level of analysis to evaluate the options based on set criteria. This would allow a high-level assessment to be utilized by the City Commission to make decisions on the appropriate path forward.

1.2.1 Study Process and Limitations

This study generally encompasses a high-level analysis of various criteria to determine the possibility of options being feasible based on environmental, technical, and financial analysis. The primary focus area is the bridge over the Red River and the stretch of Broadway indicated in **Figure 2**.

In lieu of significant time and expense required to conduct geotechnical exploration and preliminary survey, the City opted to utilize existing data to determine approximate results from an existing LiDAR survey and adjacent geotechnical studies conducted in the area, which is considered adequate for this level of analysis. Braun Intertec conducted multiple studies directly adjacent to the bridge and was able to utilize nearby borings to estimate geotechnical data and perform preliminary analysis. In addition, existing LiDAR survey is readily available and provides a reasonable level of accuracy for estimating quantities and general elevations.

It is anticipated that the City Commission will decide on direction forward in November 2023, shortly after this report is finalized. Due to the condensed timeframe for this study, using existing data is acceptable for this level of analysis; however, should this project be moved past the feasibility study and into actual design, HEI would recommend a full topographic survey be completed along with hiring a geotechnical engineering company to perform additional borings and associated analysis. The additional survey would also allow a refined hydraulic analysis to be performed to verify initial results, although no significant changes are expected.

2.0 Feasibility Criteria

Options to be considered for this project location are presented in Section 3.0. To determine the feasibility of each option and whether it should be considered moving forward requires criteria to evaluate each option. Those criteria are presented, in no particular order, in this section for evaluation. The criteria are described in general terms as they are applied towards evaluation. How each option performs relative to the established criteria is documented under the option discussions in Section 3.0.

2.1 Vehicular and Pedestrian Mobility

General vehicular and pedestrian mobility findings applicable to all options have been provided in this section. The options were evaluated and ranked based on their ability to maintain uninterrupted traffic flow along North Broadway as well as minimizing impacts to adjacent roadways and neighborhoods. This evaluation also considered the likelihood of flooding at the bridge crossing and the associated impacts from short-term road closures. Consideration was given to emergency service (EMS) vehicles and the impacts of short- and long-term closures. However, it did not progress as a feasibility criterion as the 40th Avenue North bridge can provide access to the northeast F-M metro area.

This study analyzed mobility from a multimodal perspective. Vehicular, pedestrian, bicycle, transit, and freight operations were reviewed to determine how the various options would impact potential user travel in future years. Vehicular mobility analyzed existing and future conditions. Analyzing existing conditions provides an insight into current operations and establishes a baseline for future year comparison.

The *2022 Fargo-Moorhead Metropolitan Bicycle and Pedestrian Plan* was referenced for future pedestrian and bicycle improvements in the vicinity. The plan indicated there were several near-term priority pedestrian and bicycle improvements along 40th Avenue North and 57th Avenue North. Providing access over the Red River via a new bridge would be beneficial for users gaining access to these facilities.

Existing MATBUS routes were reviewed and the only route within the general vicinity of the study area is Fixed Route 13. This route services the Northport Area and North Dakota State University facilities. The *MATBUS 2021-2025 Transit Development Plan* was reviewed and no short-, mid-, or long-term expansion of fixed route services are planned within the study area. It is anticipated that any option chosen would not impact existing or future planning transit services.

The City of Fargo's *Overdimensional Vehicle Policy* was reviewed for truck routes within the study area. From the Truck Route Map (Revised March 2020), the following roadways are approved for commercial vehicle use:

- North Broadway south of 37th Avenue North
- North University Drive
- 40th Avenue North
- 36th/37th Avenue North from North University Drive to North Broadway

North Broadway north of 37th Avenue North is not an approved route for commercial traffic. This is most likely due to the structural deficiencies of the existing bridge. It is assumed that if Options 1, 2A, or 2B are selected, this segment will be classified as an approved truck route.

Vehicular mobility was analyzed to determine the existing Level of Service (LOS). LOS is a measure of the driver's perception of the quality of service provided by the roadway network. The existing LOS within the study area is a LOS C or better. A LOS C indicates stable traffic flows, slightly reduced speeds, and mobility at peak times of the day, and minimal delays. A LOS C or better is considered acceptable for most, if not all, transportation facilities.

Future traffic volume forecasts were obtained from the 2045 F-M MetroCOG Travel Demand Model. The travel demand model is the basis for determining 30-year horizon traffic volume forecasts for the entire F-M area. The model can be used to test various existing and planned transportation alternative scenarios to make reasonable traffic volume estimates and recommendations for future improvements. With the expected growth in employment and number of households by 2045, traffic volumes are anticipated to significantly increase along North University Drive and 40th Avenue North. The increase in 2045 traffic volumes will deteriorate the existing roadway network and result in demand exceeding capacity. A LOS F is assigned for over-capacity conditions. A LOS F is indicative of heavy congestion, greatly reduced travel speeds, and significant delays. Regardless of any option selected, future geometric and intersection control improvements will be required to achieve a desirable LOS.

A traffic operations report has been prepared for this study and has been included in Appendix D. Refer to the report for an in-depth review of vehicular and pedestrian mobility.

2.2 Geotechnical Risk

The site geotechnical stability is a concern when considering the feasibility of a proposed bridge and road reconstruction. The primary reason for the closure of the existing bridge was due to excessive substructure movement caused by geotechnical instability of the north embankment.

For the purpose of this feasibility study, Braun Intertec utilized previous data from the area to investigate possible geotechnical concerns related to construction of a new bridge and approach roadway embankment. Specifically, Braun Intertec utilized previously conducted studies and reports as noted below:

- Geotechnical Evaluation Report, Broadway Bridge, North Broadway of the Red River of the North, Fargo, North Dakota (City of Fargo Project Number MS-16-J0), Braun Intertec, Project B1803205, November 13, 2019.
- *Geotechnical Evaluation Report, Royal Oaks Levee*, City of Fargo Project No. FM-19-B0, Fargo, North Dakota, Braun Intertec, Project B1905389, May 1, 2020.

Additionally, a site reconnaissance was performed on July 21, 2023, to document the current roadway and embankment conditions to determine if and how conditions had changed since the original reports.

Bank failures and slope instability was identified on the north embankment as well as the southeast embankment adjacent to the existing Broadway North alignment near the termini of Royal Oaks Drive North. The proposed options were analyzed to study impacts from potential fill or loading induced within these areas causing the potential for future stability issues or continued movement.

For all options considered, a recommended setback distance was determined from the existing north bank failure. This was used to set the location of the north abutment for all bridge options to mitigate potential movement or induced loading from the existing bank failure.

The intention of these studies was to utilize existing data in the area to determine the probable geotechnical risk of each option. If a replacement option is considered, additional geotechnical investigation and analysis should be performed to verify the results as well as determine recommended mitigation practices to ensure slope instability is not a concern for the planned roadway embankment or bridge substructure placement.

2.3 Hydraulic Impacts

Hydraulic criteria for bridge replacement feasibility hinge on FEMA's requirements for risk management and ensuring the proposed options do not impact structures. The potential bridge replacement occurs within FEMA's current effective 100-year floodplain and floodway as displayed in **Figure 3**, which shows the 100-year base flood in teal shading, while the red hatched area is the floodway. The floodway defines the limits for encroachment, or a corridor, that must be maintained to allow passage of the base flood within an allowable surcharge limit. Any construction in the floodway must demonstrate a "no-rise" and no impacted structures, or process through a Conditional Letter of Map Revision (CLOMR). The orange shading represents the 500-year floodplain limits, which has less regulatory priority than the base flood 100-year. HEI has coordinated with the North Dakota Department of Water Resources (ND DWR) to confirm applicable requirements for this project, and a Memorandum of Understanding is included within the Hydraulics Exhibit in Appendix B documenting the regulatory decisions that have been communicated regarding hydrology and hydraulics. The primary reason for the Memorandum of Understanding is that the Diversion project is anticipated to reduce the base flood elevation (BFE) and

overall flow adjacent to the Broadway Bridge. Current hydrology corresponds to a 100-year stage of 39 feet at the USGS river gage at Fargo. This translates to a BFE of 895.5 feet at the Broadway Bridge. The post-Diversion hydrology is anticipated to result in a 100-year stage of 37 feet at the Fargo gage and translates to a BFE of 894 feet at the Broadway Bridge. Due to the distance from the Fargo gage, there are certain hydraulic losses and peak attenuation such that the 2-foot stage difference at the gage does not result in an exact 2-foot elevation difference at the Broadway Bridge. At the time of this feasibility study, the Diversion project is underway with the anticipated completion date a few years after the potential reconstruction of the Broadway Bridge. The State has directed that the project must be compared against the current regulatory hydrology when analyzing potential impacts and designing applicable mitigation. Proposed options also consider the need to close the road due to flooding through analysis of the overtopping frequency of the road. Hydraulic criteria for bridge replacement feasibility hinge on FEMA's requirements for risk management and ensuring the proposed options do not impact structures.

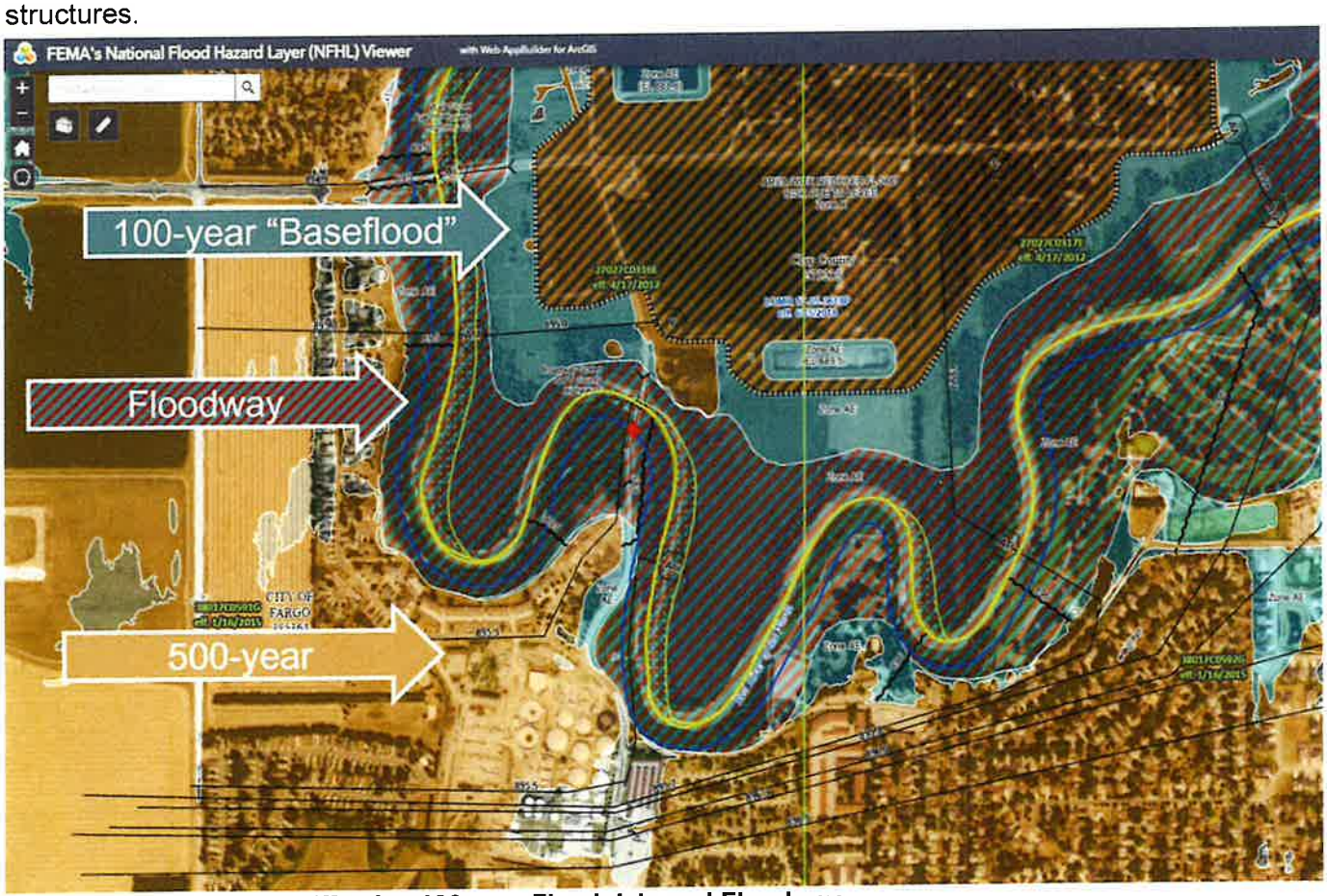


Figure 3. Current FEMA Effective 100-year Floodplain and Floodway

Although hydraulic impacts are an important criterion to consider, all options presented were designed and bridges sized to meet the criteria needed to permit a new structure. If an option is progressed that includes replacing the bridge, the hydraulic analysis should be revisited with updated preliminary survey data as well as final roadway and bridge geometry. However, based on the preliminary analysis completed for this report, we anticipate that any hydraulic impacts can be mitigated with the designs as presented. Impact mitigation is expected to include channel transition zones to alleviate the contraction/expansion impacts related to the new channel configurations proposed, to ease the transition

back to the natural channel. This will need to be coordinated with regulatory agencies following a refined analysis with detailed bridge design.

2.4 Property Impacts

This criterion focuses on the social impacts associated with indirect impacts. Each option was evaluated based on perceived impacts associated with increased traffic volumes through residential neighborhoods and improved line of sight between the roadway and adjacent residents as well as buyouts and relocations. Direct impacts, such as grading impacts and associated acquisition, were considered under Section 2.5 Property Acquisitions.

Indirect impacts are difficult to quantify. Therefore, for the purposes of this study the options were ranked based on traffic volume increase, reduction in horizontal offset to traffic, and increase in roadway elevation. These ranks were then combined and used to determine the feasibility.

2.5 Property Acquisition

In addition to the indirect property impacts that were considered, direct impacts associated with potential right-of-way needs were also evaluated. Parcels that were impacted by the roadway realignment and grading were considered a full buyout if a significant portion of the lot was impacted or if there was a significant loss of trees and visual buffer from the adjacent roadway.

Property values were determined based on the 2022 assessed value as listed on the Property Tax Report from the Cass County Geo Hub Parcel and Data Search Application (https://cass-county-hub-casscountynd.hub.arcgis.com/apps/012947fb5cb141e4b9aeafb9b699ba67/explore). Following the typical process for the City of Fargo, an additional 50% was added to the assessed value to estimate future year acquisition costs. This value is an approximation and likely to vary; however, it provides a conservative consistent measure for potential costs resulting from direct impacts to adjacent properties.

2.6 Permitting Environmental Impacts and Permitting

The purpose of the environmental impact section is to provide a summary of environmental permits and approvals likely required for project advancement. In addition, this section will summarize the critical permits and approvals needed as well as identify the agencies involved with those permitting tasks.

2.6.1 Required Permits and Corresponding Agency Coordination Needs

The following permits and approvals will be required if the Option 1, 2a, or 2b move forward to construction. Each permit and responsible agency are listed starting with federal then state and then local agencies.

2.6.2 Clean Water Act - Section 404 – US Army Corps of Engineers (USACE)

Agency coordination with the USACE Omaha District and St. Paul District will occur as to determine which regulatory office takes the lead on the project or if both USACE Districts permit the project jointly. These agencies were contacted directly. Staff from the USACE indicted that it is likely that both the St. Paul District and the Omaha District would permit this project jointly. This will require two section 404 permit applications, and each office will provide approval for the corresponding impacts and project activities.

2.6.3 Clean Water Act - Section 408 – US Army Corps of Engineers

This permit is not anticipated to be required. Coordination with City Engineering and USACE staff will be required to confirm federal status of existing levees near the project site. If existing levees in Moorhead or Fargo were built by the USACE or others but enrolled in the Federal USACE Inspection Program, a

Section 408 approval could be required. Research on the Moorhead Oakport levees and Fargo levees near the project site indicate that neither were built by the USACE or part of the federal inspection program.

2.6.4 Minnesota Protected Waters Permit – Minnesota Department of Natural Resources (DNR)

The Red River is listed as a Minnesota Protected Water. A permit is required for any impacts below the Ordinary High-Water Mark of the Red River. The area regulated generally includes the river channel and adjacent riverbanks. Any changes to the cross section of the river will need approval from the Minnesota DNR.

2.6.5 North Dakota Sovereign Lands – North Dakota Department of Water Resources (ND DWR)

This permit is required for any impacts within the North Dakota Sovereign Lands. The Red River is listed as a North Dakota Sovereign Land. The Sovereign Lands generally cover the Red River channel. It is similar to the Ordinary High-Water Mark (OHWM) for the Minnesota Protected Waters on the Minnesota side of the river. Any construction activities in the river channel will need approval from the ND DWR Sovereign Lands Program.

2.6.6 National Environmental Policy Act (NEPA) – City of Fargo

The project will likely meet NEPA standards through the completion of a documented Categorical Exclusion (CATEX) through the North Dakota NEPA review process. The City of Fargo will be the lead agency. If it is determined that over one acre of the Red River channel (Minnesota Protected Waters) is changed or impacted, a Minnesota Environmental Assessment Worksheet (EAW) may be required. The one-acre impact limit is the trigger for a mandatory EAW requirement.

2.6.7 Floodplain Related Permitting (Moorhead and Fargo) – FEMA

The project includes development in the floodplain and floodway, which is regulated at the federal level, state level, and down to the community level. The Red River of the North is the border between North Dakota and Minnesota, which is not only a state boundary, but also a boundary for different FEMA "Regions," as well as the local community boundary for Fargo and Moorhead, and Cass and Clay counties. This has implications for the permitting and will require careful bookkeeping to ensure the appropriate permits are obtained, as listed in Table 3. If a proposed bridge option is selected for replacement, the first four items on this table are required. The last item for CLOMR/LOMR and MT-2 processing may be required depending on several factors; including if the project is not able to obtain a "no-rise," if the bridge is in a substantially different location, and if the channel configuration is substantially changed. The word "substantially" may be dependent on the State's interpretation of what constitutes a substantial change. Their intent is to determine if the flood insurance rate maps accurately depict the flood risk to the communities. At this time, the feasibility study and hydraulic analysis indicate that a "no-rise" is expected but will need further confirmation once a preferred option is selected and a final bridge layout is generated.

Table 3. Hydraulics-Related Permitting

Hydraulics-Related Permitting	North Dakota	Minnesota
Floodplain Development Permit	City of Fargo	City of Moorhead
Floodway Review Application	North Dakota Department of Water Resources	N/A
No-Rise Report and Certification	North Dakota Department of Water Resources	Minnesota Department of Natural Resources
Certification of No Impacted Structures	North Dakota Department of Water Resources	Minnesota Department of Natural Resources
CLOMR/LOMR and MT-2 processing (if required)	FEMA Region 8	FEMA Region 5
	North Dakota Department of Water Resources	Minnesota Department of Natural Resources
	City of Fargo	City of Moorhead
	Cass County	Clay County

2.6.8 Minnesota Wetland Conservation Act (WCA) – Clay County Soil and Water Conservation District

This permit is required for any impacts to wetlands on the Minnesota side of the project. The WCA jurisdiction is exclusive with the Minnesota Protected Waters. Any wetland areas above the Minnesota PWI OHWM would require authorization from the Clay County SWCD.

2.6.9 Shoreland Zoning Approval – Clay County Planning and Zoning Office

Shoreland zoning rules in Minnesota generally apply to areas within 300 feet of a stream or river channel. Any construction activities within this zone requires authorization from the Minnesota Shoreland Zoning program. The Minnesota DNR is also involved as a partner with the local zoning office on these permits.

2.6.10 Summary of Environmental Impact Relative to Project Advancement

In summary, environmental impacts from the project and proposed options are not anticipated to be averse to project advancement. The site has been previously impacted by bridge construction. The project area does not contain extensive wetland areas or known sensitive environmental habitats or species. The floodplain development permits are likely the critical permit approval relative to all required approvals due to flooding issues within the Fargo-Moorhead region. However, based on current information, we do not anticipate any significant concerns as this can be mitigated with a no-rise determination.

2.7 Construction Costs

Preliminary opinions of probable costs were developed for each option, including roadway improvements, structures, right-of-way acquisition, and engineering. In addition, various City of Fargo fees and contingencies were added per their normal procedures. Those fees are described in the various estimates. The preliminary opinions of probable cost utilize 2023 average bid prices and include an increase of 5% per year until fall of 2025 (expected bid date for project) to account for inflation. The base 2023 estimates, prior to factoring for inflation, were utilized in the BCA to determine an accurate present day cost comparison.

3.0 Feasibility Performance

3.1 – Option 1 – Replace Bridge at Similar Elevation to Previous Bridge and Minimal Road Grade Raise

Figure 4. Option 1 Rendering

3.1.1 Description and General Design Criteria

This option consists of replacing the North Broadway bridge spanning the Red River with a longer structure that would be similar in elevation to the structure that was recently removed. The structure would continue to overtop during the 100-year event similar to the frequency of the previous structure.

The roadway to the south would be at a similar elevation to the existing roadway but would be shifted west where possible to aid in geotechnical concerns along the river.

3.1.1.1 Roadway Design

Current City of Fargo, AASHTO, and Minnesota State Aid Standards were utilized to develop the roadway design. Based on the semi-urban nature of the corridor, a design speed of 30 mph was utilized, which matches the posted speed limit for the existing corridor. A rural section, including shoulders and adjacent ditches, is also desirable to limit the amount of additional infrastructure, such as storm sewer.

The typical section was set to satisfy City of Fargo and *Minnesota Administrative Rules 8820.9920 Minimum Design Standards; Rural and Suburban Undivided; New or Reconstruction Projects* standards and consists of a 12-foot-wide driving lane and 6-foot-wide shoulder. For cost estimating purposes, an 8-inch bituminous section with 9-inch aggregate base was utilized following City of Fargo standards. The existing concrete shared use path located east of North Broadway would also be replaced with a concrete path as part of this option, connection to the existing east/west path system following the south bank of the Red River as well as a connection to the bridge crossing the Red River.

Figure 5. Option 1 Typical Section

The existing geotechnical stability issues located approximately 500 feet north of the intersection of 37th Avenue North and North Broadway requires the roadway to be realigned to the west approximately 85 feet. Realignment further to the west is restricted due to the existing Royal Oaks levee. Through preliminary coordination with Braun Intertec, it is anticipated the realignment will not be sufficient to provide the required factor of safety; therefore, additional mitigation measures are anticipated to meet geotechnical requirements. This includes excavation of the old roadway as well as a retaining wall along the east side of the shared use path to reduce fill and the associated weight on the riverbank.

This option would maintain a similar roadway profile and bridge crossing elevation as exists today. Therefore, the corridor would continue to flood during a less than 10-year event resulting in temporary closure and mobility and social impacts.

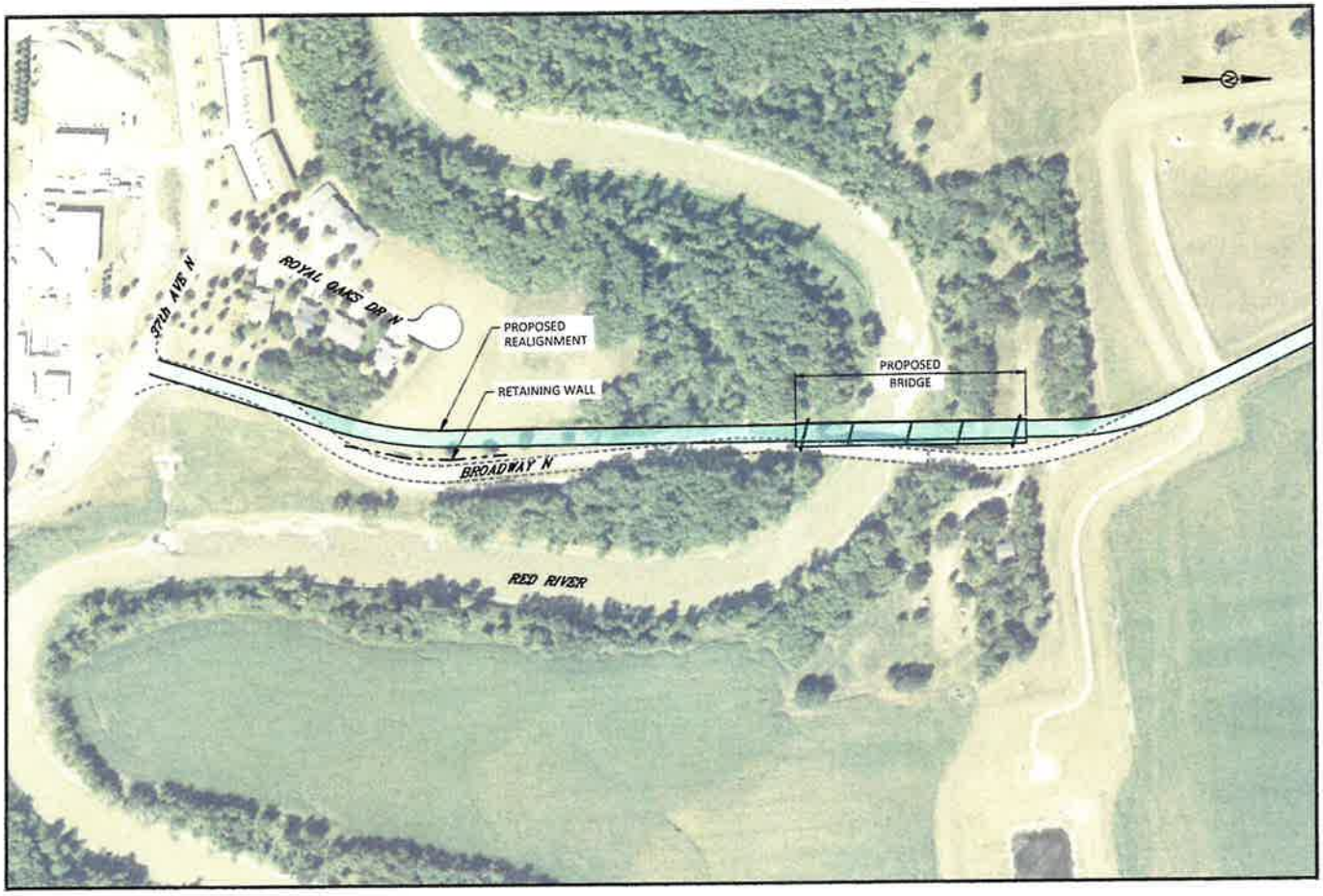


Figure 6. Option 1 Proposed Roadway Realignment and Bridge

3.1.1.2 Structural Design

Typical Section and Length

This option consists of a 4-span prestressed, precast concrete beam bridge 488 feet in length. The bridge clear width is 40 feet wide and includes 12-foot lanes and 8-foot shoulders. The bridge also includes a 10-foot-wide multi-use pedestrian pathway protected by a concrete barrier (traffic side) and an ornamental metal railing (edge of deck). The bridge deck width selected is consistent with NDDOT and MnDOT recommendations for minimum bridge width for ADT of 2,650 vehicles per day.

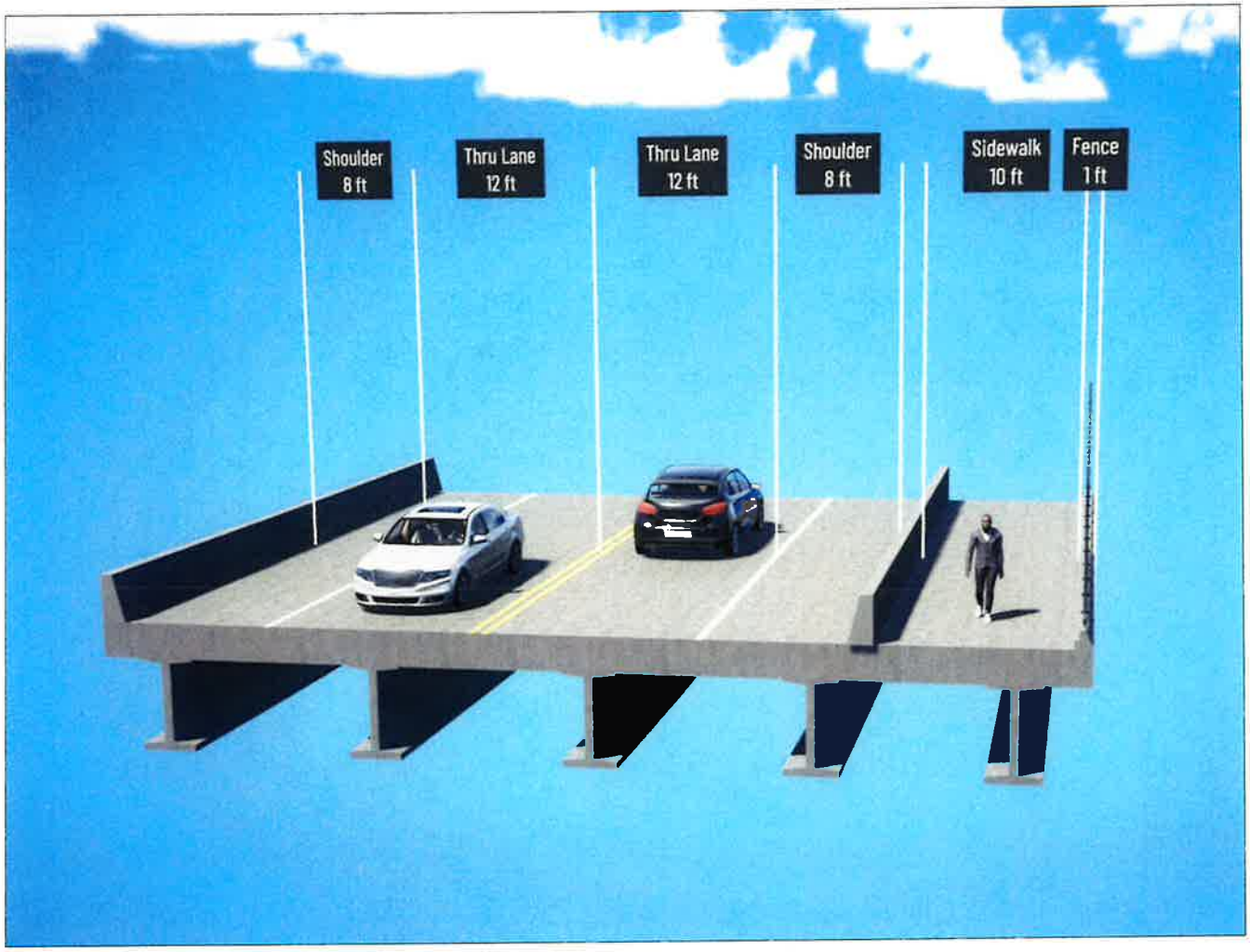


Figure 7. Bridge Deck Typical Section

It is estimated that the most cost-effective span lengths for the site would be between 120 feet and 150 feet. For estimating purposes, the bridge span arrangement selected included a maximum span length of approximately 135 feet in length and utilizes 6-MN54 shape prestressed concrete beams spaced at 9 feet, 3 inches. Other beam types such as precast prestressed box beams were considered but are not as efficient for the span lengths considered and do not perform as well when subjected to buoyant forces. Although expected to be slightly higher cost at this time, a potential alternative to prestressed concrete beams would be steel plate girders. Additional investigation is recommended if this option is selected to optimize beam type, span length, beam section, and beam spacing. The use of less conventional structure types, such as arches, trusses, suspension, segmental, or cable-stayed bridges, is not considered feasible because the site does not require a signature type bridge and are cost prohibitive relative to bridge types presented in this report.

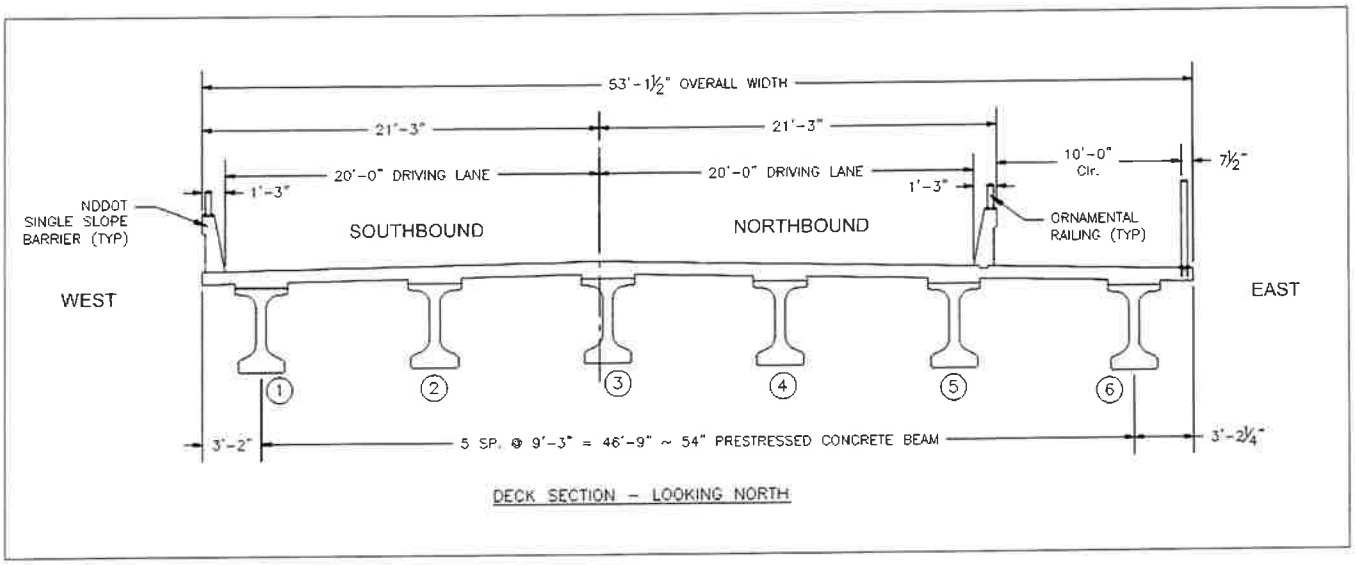


Figure 8. Bridge Typical Section & Beam Layout

Bridge Alignment and Geometry

The bridge is located on a tangent horizontal and vertical alignment. The alignment selected crosses the Red River of the North perpendicular to the channel just downstream of the previous bridge location and the profile was selected to reduce approach roadway embankment loading near the south embankment geotechnical area of concern. The planned bridge deck elevation is approximately 1 foot above the existing bridge deck (elevation 884.3 feet at the south end) and would overtop during flood events similar to the previous structure.

As shown in the bridge plan and profile located in Appendix C, the proposed bridge low member is approximately 1.2 feet higher than the existing bridge. During a 100-year flood event post-Diversion (elevation 894.0 feet) the bridge would be completely submerged and designed for lateral and buoyant forces. The bridge substructure will be required to be constructed at a skew to match the river channel (approximately 20 degrees) and is expected to consist of concrete parapet style abutments founded on multiple rows of deep foundation piling and concrete piers founded on multiple rows of deep foundation piling or caissons. Although similar in geometric layout and elevation, the proposed bridge length is approximately 180 feet longer than previous bridge due to the recommended geotechnical setback distance on the north bank due to the slope instability issues. Additionally, the bridge length was increased due to the geotechnical recommended earthen slopes under the bridge (6H:1V south bank, 8H:1V north bank) being flatter than existing (3.5H:1V south bank, 6.5H:1V north bank).

3.1.2 Vehicular and Pedestrian Mobility

This option would provide the traveling public with another facility to cross the Red River in the northeast corner of the Fargo-Moorhead metro area, thus increasing mobility. It would provide uninterrupted traffic flows from 37th Avenue North to 57th Avenue North with segment ends having interrupted intersection control. Under this option, vehicle miles traveled, and vehicle hours traveled would be reduced compared to Option 3 (no bridge).

This option also increases pedestrian and bicycle mobility by providing access to future improvements north of the North Broadway Bridge. Having a robust multimodal network that includes access across physical barriers, such as a river, increases active transportation demand.

This option would have a similar roadway vertical profile and bridge crossing elevation to the existing bridge. The corridor would be inundated during flooding events less than a 10-year event, resulting in temporary closure and reduced roadway reliability. Reliability is essential as it provides consistency and dependability so users can plan their trips with confidence knowing they will reach their desired destination on time.

3.1.3 Geotechnical Risk

For this option, the north bridge abutment was placed outside of the recommended bank failure setback limit to mitigate potential of abutment stability issues. Due to the extent of the north bank slope failure zone and limitations on span length, it is expected several piers will be required to be located within the north failure plane and additional design considerations will be required to ensure loading induced by possible slope movement will not jeopardize the stability or strength of the piers. While it is expected at this time that those concerns can be mitigated with an appropriate design, due to the limited analysis completed as part of this study, we felt it prudent to include additional cost for investigation and mitigation design practices to account for these requirements.

As stated above, additional concerns exist due to the proximity of the south approach roadway embankment to the existing southeast bank failure zone. A retaining wall adjacent to the east side of the multi-use path would likely be required to reduce loading on the existing bank failure zone and mitigate potential for additional slope failure.

3.1.4 Hydraulic Impacts

This option closely resembles the bridge configuration prior to its recent removal in 2022. It will continue to overtop during flood events approximately equivalent to or larger than the 10-year event. There are no anticipated hydraulic impacts with this option.

3.1.5 Property Impacts

This option may have indirect impacts to properties adjacent to North Broadway as well as the surrounding neighborhoods; however, these impacts are anticipated to minor. Due to the realignment of the roadway to the west, traffic will be operating closer to the existing residents on the east side of Royal Oaks Drive North. However, there will be minimal impacts to the existing trees that are creating a visual buffer for the properties. The roadway elevation will not be modified significantly and the distance from the residents to the roadway will not be reduced by half or greater, so a noise study is not anticipated with this option. Additional indirect impacts will occur when the roadway is flooded, and traffic is temporarily detoured through adjacent neighborhoods. This impact is not anticipated to be greater than it is under the current conditions.

3.1.6 Property Acquisition

Direct impacts to adjacent properties are not anticipated with this option. Realignment to the west would be maintained within the existing right-of-way for North Broadway, right-of-way acquired for the construction of the Royal Oaks Levee, and Clay County flood buyout properties.

3.1.7 Construction Costs

A preliminary opinion of probable cost was developed for this option. The anticipated construction and engineering costs incorporating 5% inflation per year until fall of 2025 is $20,333,368.44. (See Appendix A)

3.2a – Option 2a – Replace Bridge with Low Member and Remaining Roadway Being Above the Post-Diversion 100-Year Event and Tie Roadway into 37th Avenue North at South End

Figure 9. Option 2a Rendering

3.2a.1 Description and General Design Criteria

This option consists of replacing the Red River bridge with a longer structure that would have the low member of the bridge and the roadway above the post-Diversion 100-year event. This option raises the grade of the bridge and roadway south of the bridge significantly so geotechnical and hydraulic impacts are greater than Option 1. This option is also the only option that entails home property acquisitions to accommodate the fill for the roadway while simultaneously shifting it west to avoid geotechnical constraints along the river. Specific impacts are addressed in the sections that follow.

3.2a.1.1 Roadway Design

This option would reconstruct North Broadway following the same standards and typical section to those discussed for Option 1. Also, the shared use path east of North Broadway will be maintained as well as a path up to the bridge south of the river. However, this option would raise the roadway to maintain access during a 100-year flood event post-Diversion operation. The resulting raise would be more than 10 feet higher than the existing roadway. To avoid geotechnical stability concerns, the roadway would be

realigned approximately 160 feet to the west. The roadway would also be designed to cross over the existing Royal Oaks levee to maintain the existing level of flood protection for the neighborhood.

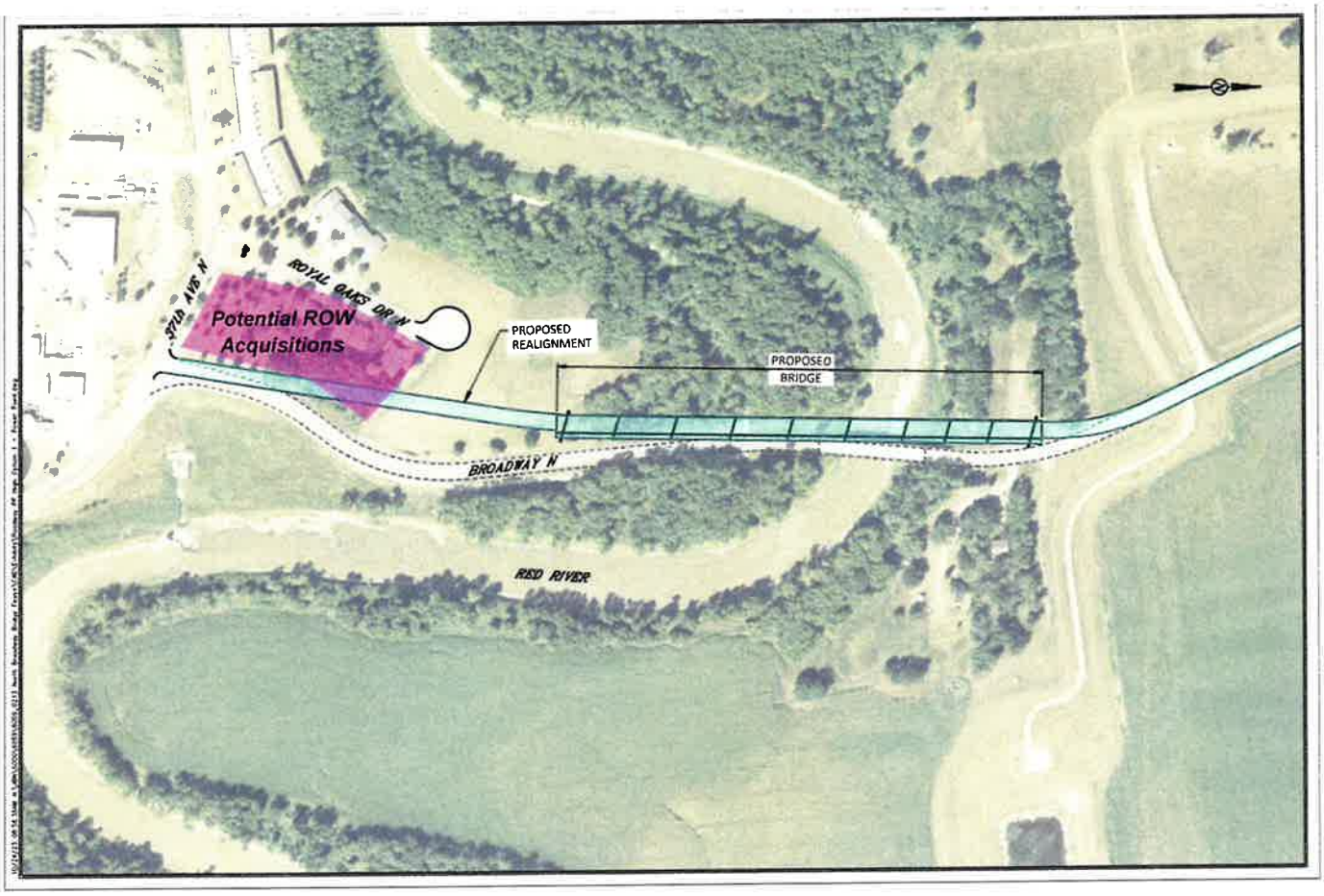


Figure 10. Option 2a Proposed Roadway Realignment and Bridge

3.2a.1.2 Structural Design

Typical Section and Length

This option consists of a 9-span prestressed, precast concrete beam bridge 1,095 feet in length. The bridge section geometry, span lengths, and beam type selection are similar to Option 1 and can be found in Section 3.1.1.1.

Bridge Alignment and Geometry

The bridge is located on a tangent horizontal alignment and a crest curve vertical alignment. The alignment selected is shifted to the west in comparison to the existing alignment and crosses the Red River of the North perpendicular to the channel just downstream of the existing bridge. The roadway and bridge profile were selected to maintain an elevation above the pre- and post-Diversion 100-year flood. The planned bridge deck elevation would allow for open traffic during flood events. As shown in the bridge plan and profile located in Appendix C, the proposed bridge low member would also be above flood events. The bridge substructure will be required to be constructed at a skew to match the river channel (approximately 20 degrees) and is expected to consist of concrete parapet style abutments founded on multiple rows of deep foundation piling and concrete piers founded on multiple rows of deep foundation piling or caissons. The proposed bridge length was driven by the required geotechnical setback distance on the north bank and the floodway limits on the south bank. Like Option 1, the slopes

below the bridge are flatter than existing according to the maximum geotechnical slope recommendations (6H:1V south bank, 8H:1V north bank).

3.2a.2 Vehicular and Pedestrian Mobility

This option would provide the same mobility benefits as Option 1.

This option would raise the grade of North Broadway to maintain access during a 100-year flood event, reducing the potential for temporary road closures. North Broadway reliability is improved compared to Option 1.

3.2a.3 Geotechnical Risk

For this option, the north bridge abutment was placed outside of the recommended bank failure setback limit to mitigate potential abutment stability issues. Due to the extent of the north bank slope failure zone and limitations on span length, it is expected that several piers will be required to be located within the north failure plane and additional design considerations will be required to ensure loading induced by possible slope movement will not jeopardize the stability or strength of the piers. While it is expected at this time that those concerns can be mitigated with an appropriate design, due to the limited analysis completed as part of this study, we felt it prudent to include additional cost for investigation and mitigation design practices to account for these requirements.

As stated above, additional concerns exist due to the increased fill of the south approach roadway embankment being near the existing southeast bank failure zone. A summary of the geotechnical analysis can be found in Appendix E.

3.2a.4 Hydraulic Impacts

This option includes a substantial road raise, significantly lengthens the bridge opening and has a wider channel configuration. The bridge remains above the 100-year water surface elevation with no overtopping of the roadway. There are no anticipated hydraulic impacts with this option.

3.2a.5 Property Impacts

Due to the substantial realignment and change in road elevation, indirect impacts to the existing residential properties east of Royal Oaks Drive North is anticipated. This option would also remove the existing trees and visual buffer between the buildings and the roadway. Due to the change in alignment and profile, a noise analysis would be required if the residences are to remain. However, due to the direct impacts discussed in Section 3.2f (Property Acquisition) buyout of these properties is anticipated, resulting in additional social impacts due to relocation.

3.2a.6 Property Acquisition

The proposed improvements to North Broadway will require significant grading within the existing parcels west of the roadway. Grading includes fill slopes, road ditch construction, and tree clearing to accommodate the new alignment. Due to the extent of direct and indirect impacts to these properties, it is assumed for this feasibility study that all properties east of Royal Oaks Drive North will be bought out and relocated as part of this option.

3.2a.7 Construction Costs

The anticipated construction and engineering costs incorporating 5% inflation per year until fall of 2025 is $36,865,820.70. (See Appendix A)

3.2b – Option 2b – Replace Bridge with Low Member and Remaining Roadway Being Above the Post-Diversion 100-Year Event and Tie into Cul-de-Sac at Royal Oaks Drive North

Figure 11. Option 2b Rendering

3.2b.1 Description and General Design Criteria

This option consists of replacing the Red River bridge with a longer structure that would have the low member of the bridge and the roadway above the post-Diversion 100-year event, similar to Option 2a. The difference in this option is that the roadway ties in at the existing cul-de-sac at Royal Oaks Drive North. This entails modifying existing levees to maintain flood protection and also sending traffic through a neighborhood that previously had a dead-end road. Specific impacts are addressed in the sections that follow.

3.1b.1.1 Roadway Design

Like options 1 and 2a, this option would utilize the same design standards and typical section for the roadway. Like Option 2a, the shared use path east of North Broadway will be maintained as well as a path connection parallel to North Broadway to the south end of the bridge. However, this option would realign and raise Broadway to maintain access during a 100-year flood event post-Diversion operation as well as revise Broadway to tie in with Royal Oaks Drive North instead of 37th Avenue North.

For this study, the roadway design was set to avoid direct impacts to additional parcels within the Royal Oaks neighborhood; therefore, the road raise was set to tie into the existing cul-de-sac then ramp up to the bridge crossing. This approach will result in an impact to the existing levee system. To maintain the current level of protection, this option would realign the levee system to the northeast where it will cross Broadway south of the abutment. A concrete sleeper slab through the roadway to establish the line of protection is anticipated to minimize the shift in the existing levee system.

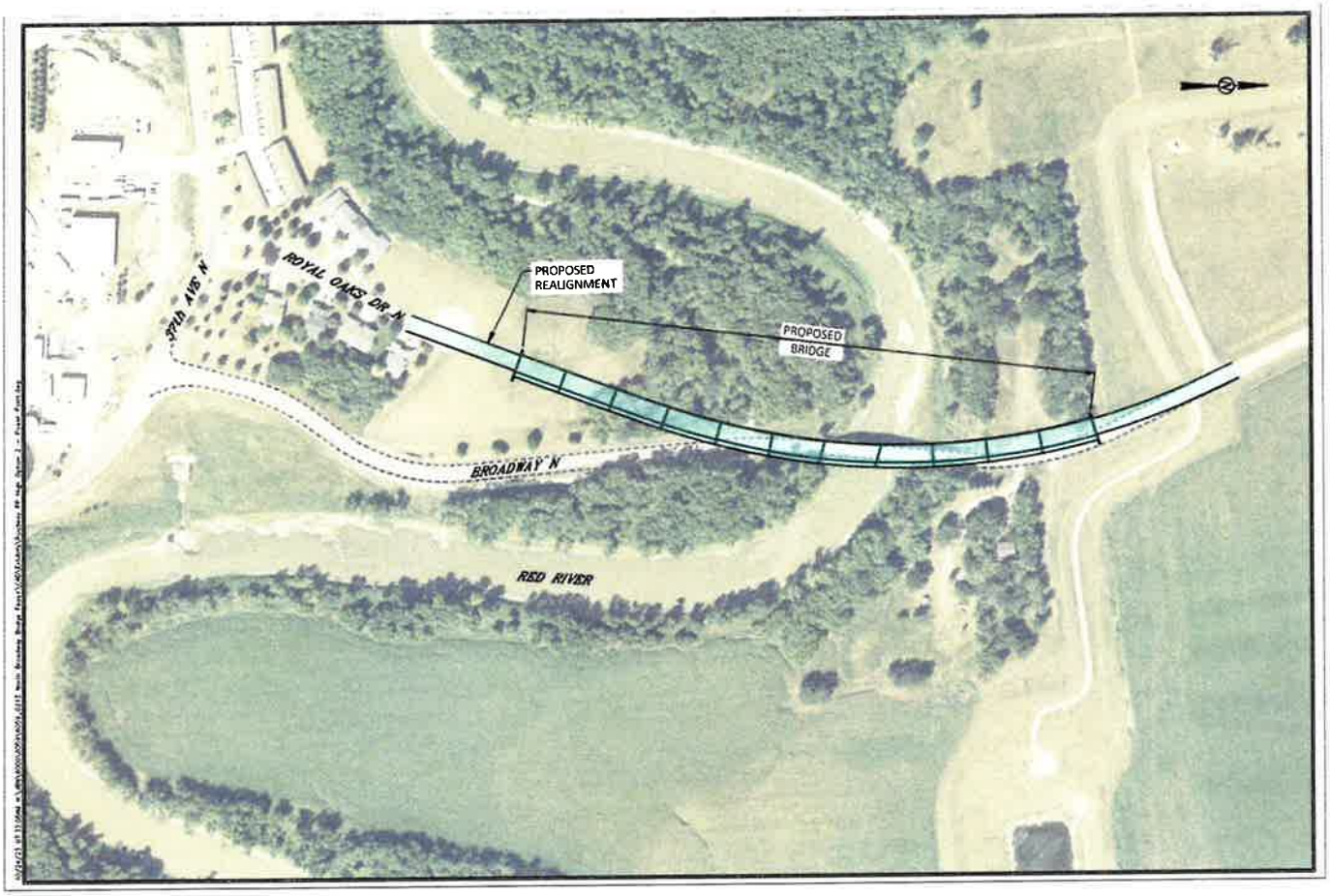


Figure 12. Option 2b Proposed Roadway Realignment and Bridge

3.1b.1.2 Structural Design

Typical Section and Length

This option consists of an 11-span prestressed, precast concrete beam bridge 1,375 feet in length. The bridge section geometry and span lengths are similar to Option 1 and can be found in Section 3.1.1.1. Because of the degree of horizontal curvature on the bridge, curved steel plate girders at a similar depth to the MN 54 prestressed concrete beam are the anticipated beam type for this option. Curved geometry on a bridge presents added complexity and, depending on the degree of curvature, curved girders could be required. This is partially driving the anticipation of utilizing steel plate girders; however, that will ultimately be decided during final design if this option should move forward.

Bridge Alignment and Geometry

The bridge is located on a horizontal curved alignment and a crest curve vertical alignment. The alignment selected is shifted to the west in comparison to the existing alignment and crosses the Red River of the North perpendicular to the channel just downstream of the existing bridge. The roadway and

bridge profile were selected to connect to Royal Oaks Drive North and maintain an elevation above the pre- and post-Diversion 100-year flood. The planned bridge deck elevation would allow for open traffic during flood events. As shown in the bridge plan and profile located in Appendix C, the proposed bridge low member would also be above flood events. The bridge substructure will be required to be constructed at a skew to match the river channel (approximately 20 degrees) and curvature of the bridge and is expected to consist of concrete parapet style abutments founded on multiple rows of deep foundation piling and concrete piers founded on multiple rows of deep foundation piling or caissons. The proposed bridge length was determined by the recommended geotechnical setback distance on the north bank, due to the existing slope instability, and the floodway limits on the south bank to ensure the bridge does cause a stage increase during flood events. Like other options, the slopes below the bridge are flatter than existing according to the maximum geotechnical slope recommendations (6H:1V south bank, 8H:1V north bank).

3.2b.2 Vehicular and Pedestrian Mobility

This option would provide the same mobility benefits as Options 1 and 2A. This option also includes maintaining North Broadway access during a 100-year flooding event, increasing the reliability of North Broadway compared to Option 1.

This option realigns North Broadway through the Royal Oaks neighborhood. Royal Oak Drive North is a local roadway that currently serves an estimated 100 vehicles or less per day and has lower operating speeds as typically observed on roadways ending at a cul-de-sac. North Broadway is classified as a minor arterial roadway. Revising Royal Oak Drive North from a local to minor arterial roadway will have a negative impact on the perceived quality of service. This is primarily due to the increase in traffic volumes and speeds that would be excepted.

The existing Royal Oaks Drive North and 37th Avenue North intersection design should be reviewed to ensure the intersection can safely and efficiently accommodate anticipated operating speeds, traffic volumes, and vehicle fleet mix.

3.2b.3 Geotechnical Risk

For this option, the north bridge abutment was placed outside of the recommended bank failure setback limit to mitigate the potential of abutment stability issues. Due to the extent of the north bank slope failure zone and limitations on span length, it is expected several piers will be required within the north failure plane and additional design considerations will be required to ensure loading induced by possible slope movement will not jeopardize the stability or strength of the piers. While it is expected at this time that those concerns can be mitigated with an appropriate design, due to the limited analysis completed as part of this study, we felt it prudent to include additional cost for investigation and mitigation design practices to account for these requirements.

Because the south abutment is located away from the existing slope failure on the south end, there is not expected to be any geotechnical concern on the south end of the bridge or roadway embankment for this option.

3.2b.4 Hydraulic Impacts

This option is similar to Option 2a, with a slightly higher low chord than Option 2a, and some minor channel geometry differences. The bridge remains above the 100-year water surface elevation with no overtopping of the roadway. There are no anticipated hydraulic impacts with this option.

3.2b.5 Property Impacts

This option will redirect through traffic on North Broadway along Royal Oaks Drive North, an existing dead-end residential roadway. Traffic volumes will increase from less than 200-2,650 vehicles per day. The increased traffic volumes are anticipated to have significant indirect impacts to the adjacent residential properties. As part of this study, it is assumed these properties will not be acquired; therefore, a noise study is anticipated as part of the environmental document.

3.2b.6 Property Acquisition

Direct impacts to adjacent properties are not anticipated with this option. Realignment to the cul-de-sac would be maintained within the existing right of way for North Broadway, right-of-way acquired for the construction of the Royal Oaks Levee, and Clay County flood buyout properties.

3.2b.7 Construction Costs

The anticipated construction and engineering costs incorporating 5% inflation per year until fall of 2025 is $46,400,887.26. (See Appendix A)

3.3 – Option 3 – Do Not Construct Bridge Crossing

3.3.1 Description and General Design Criteria

This option does not replace the previous bridge and results in a permanent detour of traffic from the North Broadway corridor. Due to the detouring of traffic and permanent closure, various improvements will be required. Roadway obliteration, permanent signing, and dead-end roadway improvements will be made to North Broadway. In addition, the increased traffic on 10th Street will necessitate traffic calming measures be added to divert traffic from 10th Street. Further details are described below.

3.3.1.1 Roadway Design

This option includes multiple road improvements to reduce traffic volumes along 10th Street North, north of 36th Avenue North as well as removal of the existing North Broadway roadway and incorporation of a turnaround on Clay County Road 1, north of the Red River. For cost estimating purposes, the typical sections would consist of 8-inch bituminous section with 9-inch aggregate base with curb and gutter following City of Fargo standards.

Improvements along North Broadway consists of obliterating the old roadway from 37th Avenue North, north to the Red River. The existing shared use path would remain in place. North of the Red River, a t-termination would also be incorporated to maintain access to parcels and provide for a turnaround on the dead-end roadway.

To reduce traffic volumes and average travel speeds along 10th Street North to levels observed prior to removal of the existing bridge, additional traffic calming measures are proposed. This includes realignment of intersection of 36th Avenue North, 37th Avenue North, and 10th Street North. Currently 37th Avenue to 10th Street North operates as a through roadway with the 36th Avenue North approach from the west being stop controlled. This option would realign the intersection to have the east/west corridor of 36th Avenue North and 37th Avenue North be the through corridor and 10th Street North would be stop controlled. Curb bump outs would also be incorporated at strategic locations along 10th Street North to maintain parking opportunities but also slow traffic speeds. Bump outs are anticipated to be constructed at the intersection with 37th Avenue North and two cul-de-sac. The geometric layout of the bump outs will be consistent with AASHTO standards and narrow the roadway from approximately 30 feet wide to 24 feet wide. To further improve traffic volumes along 10th Street North, access control is

proposed along Cass County Road 20 (40th Avenue Northwest). A median curb would be constructed to prevent westbound to southbound left turns and northbound to eastbound left turns.

Figure 13. Option 3 Do Not Construct Bridge Crossing

3.3.1.2 Structural Design

This option does not consist of any structural design or consideration as the existing bridge has been removed and no bridge is to be replaced.

3.3.2 Vehicular and Pedestrian Mobility

This option results in reduced mobility. It is estimated that the No Bridge option increases the vehicles miles traveled and vehicles hours travel in the Fargo-Moorhead metro area by 147,400 miles and 64,500 hours per year, respectively.

As part of the traffic operations report provided in Appendix D, traffic volumes and speed data within the study area were reviewed to determine travel patterns and behaviors before and after the bridge closure on February 11, 2021. Traffic volumes have been shown in **Figure 14**. Traffic volume and speed data indicate the following:

- Approximately 50% of North Broadway traffic was diverted to North University Drive and North 10th Street. Remaining traffic is leveraging roadway facilities east of the Red River and the 12th Avenue North Bridge.
- Traffic volumes have increased by as much as 200% on 10th Street North.
- Average travel speeds along 10th Street North increased from 22 miles per hour (mph) to 27 mph before and after the bridge closure, respectively. The posted/statutory speed limit on 10th Street North is 25 mph.
- The 85th-percentile speeds along 10th Street North decreased from 33 mph to 31 mph before and after the bridge closure, respectively. The 85th percentile speed defines the travel speed at which 85% of all traffic is traveling at or below. The before and after 85th percentile speeds exceed the posted/statutory speed limit of 25 mph.

As indicated in the roadway design criteria for Option 3, traffic calming measures are proposed to address changes in traffic volumes and average travel speeds along 10th Street North. As defined by the FHWA, ***"The primary purpose of traffic calming is to support the livability and vitality of residential and commercial areas through improvements in non-motorist safety, mobility, and comfort. These objectives are typically achieved by reducing vehicle speeds or volumes on a single street or a street network. Traffic calming measures consist of horizontal, vertical, lane narrowing, roadside, and other features that use self-enforcing physical or psycho-perception means to produce desired effects."*** Traffic calming measures were selected to best achieve the desired results. The operational and mobility benefits of each proposed traffic calming measure have been provided below.

- The 40th Avenue North access management measure will create a physical barrier preventing specific cut-through movements, namely the westbound to southbound and northbound to westbound left turns. As future traffic volumes are anticipated to increase along 40th Avenue North, access restrictions would provide improved minor street operations than a full access intersection.
- Curb extensions reduce travel speeds by visually narrowing the roadway and provide safety benefits for pedestrians by increasing visibility and reducing crossing lengths.
- Realigning the intersection of 10th Street North and 37th Avenue North doesn't provide the same physical barrier as 40th Avenue North access management, but when used in combination with other traffic calming measures, it can be used to discourage cut-through traffic.

Figure 14. 2023 AADT Traffic Volume Comparison With and Without Bridge

3.3.3 Geotechnical Risk

This option doesn't involve any reconstruction near the river so geotechnical risk is not a viable consideration. The existing pedestrian path will be left in place and is subject to geotechnical concerns, but that is not a criteria when considering if this option is feasible.

3.3.4 Hydraulic Impacts

If the City elects to not reconstruct the bridge, the passage of the base flood through town will be unobstructed by any bridge deck or piers in the water and will produce a small reduction to the water surface profile, with a slight reduction in risk for adjacent properties in the floodplain.

3.3.5 Property Impacts

Minor indirect impacts to residences along 36th Avenue North result from this option as traffic volumes are increased. However, objective of the improvements in this Option is to restore conditions along 10th Street North to near pre-bridge removal conditions.

3.3.6 Property Acquisition

This option is not anticipated to have any direct impacts on private properties. The realignment of 36th Avenue North as part of the traffic calming measures is anticipated to have a minor impact on the North Broadway Park and Fargo Wastewater Treatment facility. As these properties are owned by the City of Fargo, no additional costs were considered for property acquisition.

3.3.7 Construction Costs

The anticipated construction and engineering costs incorporating 5% inflation per year until fall of 2025 is $817,680.15. (See Appendix A)

4.0 Financial Feasibility

4.1 Benefit-Cost Analysis

An important process in any planning application is to quantify the benefits of an alternative and weigh them against the costs. Often, projects are advanced to construction without consideration to the public's return on their investment. This process, referred to as Benefit-Cost Analysis (BCA), is a systemic approach of identifying, quantifying, and comparing construction, maintenance, and other related costs to expected benefits. BCA ensures that resources will be used for projects that provide economic benefits to would be users and the F-M area. In general, BCAs are intuitive, but often difficult to demonstrate because costs are often very straightforward to determine and quantify, while benefits are much more abstract. Benefits are often spread out over a much longer timeframe and can include various items such as social, economic, and environmental benefits that can be interpreted with some degree of ambiguity.

It is recognized that many factors are given consideration when determining whether to move forward with a project or not. BCA can be used as a benchmark or starting point for the decision-making process.

BCA worksheets can be found in Appendix F.

4.1.1 Benefit Considerations – Time Value of Money

An important aspect of BCA is the concept of time value of money. Discounting rates are used to acknowledge that benefits and costs that occur sooner in time are valued higher than those that occur in a more distant future and that there is a cost associated with diverting resources required for an investment from other productive uses in the future. Discounting results in future streams of benefits and costs being expressed in the same present value terms.

Discounting rates can be defined as either nominal or real. Nominal discount rates include the effects of inflations. An example of nominal rates are market rates. Real discount rates remove the effects of inflation and allow the inclusion of future costs and benefits valued in today's dollars in the life-cycle cost analysis. In accordance with Office of Management and Budget (OMB) Circular A-94 (Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs), a real discount rate of 7% was used for the BCA.

To avoid inflation within the BCA, 2023 was considered the base year for all analysis. With the use of real discounting rates, all future benefits and costs were valued in 2023 dollars.

4.1.2 Benefit Considerations – Addressing Different Lifespans

Another consideration in BCA is addressing different lifespans. The typical roadway has a service life of approximately 20 years while a bridge can last substantially longer when properly maintained. By assigning terminal and salvage values for each item, the value of useful service life remaining after the analysis period can be factored into the life-cycle cost analysis. The roadway service life was assumed to be 19 years to align with the benefits analysis (i.e., 2026-2045) and the bridge service life was assumed to be 75 years (i.e., 2026-2101).

Salvage values can be determined from the initial cost of the item and the assumed service life remaining after the analysis period. Salvage values reduce the costs occurred within the analysis period. It should be noted that maintenance costs beyond the analysis period have no salvageable value. Maintenance items are required to achieve the full-service life.

4.1.3 Benefits Determination

Benefits were determined from the 2045 F-M MetroCOG Travel Demand Model. The travel demand model is the basis for determining 30-year horizon traffic volume forecasts for the entire F-M area. The model can be used to test various existing and planned transportation alternative scenarios to make reasonable traffic volume estimates and recommendations for future improvements. The primary travel demand model output data used for benefit analysis were the 2045 average annual daily traffic (AADT) volume, vehicle miles traveled (VMT), and vehicle hours traveled (VHT) under conditions with and without the North Broadway bridge.

Prior to calculating benefits, a review of the 2045 travel demand model output data was performed to check for reasonableness. The model estimated significant traffic volume increases within the study area, but a 60% drop in traffic volumes across the North Broadway bridge. The review indicated that it could be reasonably assumed that the North Broadway bridge AADT volume was low and the 2045 travel demand model output should be adjusted with similar historical trends prior to the bridge closure in February of 2021. It was recommended to take a conservative approach and use the 2023 AADT volume for 2045 conditions. An in-depth review of the 2045 travel demand model can be found in Appendix D. As North Broadway bridge traffic volumes are anticipated to remain constant from 2023 to 2045, the benefits associated with each year of analysis will also remain constant.

The 2045 travel demand model output, after adjustments, concluded that the F-M regional transportation network would experience a reduction of 147,400 vehicle miles traveled and 64,500 vehicle hours traveled per year with the North Broadway bridge in place.

Consideration must be given to vehicle classification (i.e., passenger cars vs commercial trucks) and vehicle occupancy rates when calculating benefits. For all benefits, higher benefit cost values are generally assigned to commercial trucks. As no vehicle classification distribution data was available, the

BCA assumed 3% commercial truck traffic. Also, it is recommended to calculate value of travel time savings on a person-hours traveled basis, not on the time a vehicle spend traveling on the roadway. Occupancy rates were used to convert vehicle miles traveled to person-hours traveled.

Various national guidance and data was used to assign monetary values to the benefits. Benefit user costs can be found in the Benefit-Cost Analysis worksheets located in Appendix F.

4.2 Project Costs

Detailed estimates of project costs for bridge and road construction are included in Appendix A. A summary of estimated costs for each option are included below in Table 4. In addition, various fees and contingencies were added as noted in the footnotes. It is anticipated that the cost of any option would be split between Clay County and the City of Fargo per agreed upon cost splits. The City has also applied for Federal Surface Transportation Block Grant Program (STBG) Funds, which have been deducted from the portion that the City would have to pay. Most of the costs associated with road construction are on the North Dakota side of the project and thus are contributed towards the portion owed by the City of Fargo. Costs are used as input into the BCA as shown in Appendix F.

Table 4. Project Costs

Option	1	2a	2b	3
Road Construction[1]	$4,741,632.00	$3,004,533.00	$2,385,369.00	$579,915.00
Bridge Construction[1]	$10,483,452.00	$22,886,577.00	$32,311,629.00	$0.00
Total Estimated Construction Costs	**$15,225,084.00**	**$25,891,110.00**	**$34,696,998.00**	**$579,915.00**
Estimated Local Construction Costs[2]	**$9,825,084.00**	**$20,491,110.00**	**$29,296,998.00**	**$579,915.00**
City Fees and Contingency[3]	$2,063,267.64	$4,303,133.10	$6,152,369.58	$121,782.15
Right-of-Way and/or Acquisition Fees	$0.00	$2,529,000.00	$0.00	$0.00
Consultant Engineering and Construction Management[4]	$3,045,016.80	$4,142,577.60	$5,551,519.68	$115,983.00
Total Fees and Engineering	**$5,108,284.44**	**$10,974,710.70**	**$11,703,889.26**	**$237,765.15**
Summary				
Federal STBG Funds	$5,400,000.00	$5,400,000.00	$5,400,000.00	$0.00
City of Fargo Portion	$7,137,500.22	$15,799,676.85	$18,993,128.13	$698,797.58
Clay County Portion	$7,795,868.22	$15,666,143.85	$22,007,759.13	$118,882.58
Total Local Portion	**$14,933,368.44**	**$31,465,820.70**	**$41,000,887,26**	**$817,680.15**
Total	**$20,333,368.44**	**$36,865,820.70**	**$46,400,887.26**	**$817,680.15**

1 Includes 20% contingencies and 5% inflation/year for two years
2 Total Estimated Construction Cost – Federal Funds
3 Includes the following: 4% administration, 4% interest, 3% legal/misc. fees, and 10% contingency.
4 Options 1 and 3 assume 10% of the estimated construction costs for preliminary and final engineering and 10% of the estimated construction costs for construction engineering and testing. Options 2a and 2b assume 8% of the estimated construction costs for preliminary and final engineering and 8% of the estimated construction costs for construction engineering and testing.

4.3 Benefit-Cost Analysis Summary

A summary of the BCA is shown below in **Table 5**. The net present value of the benefits and costs are provided in 2023 dollars. The net benefits are presented as either a positive number indicating the benefits outweigh the costs or a negative value indicating the costs outweigh the benefits. Generally, a positive net benefit indicates that the option would warrant additional consideration. Options resulting in a negative net benefit may also warrant consideration due to the level of analysis and variability when projecting current and future costs during times of high inflation. The footnotes below **Table 5** provide a summary of the items considered in the net present value of benefits and costs for the various options.

Table 5. Benefit-Cost Analysis Summary

Benefit-Cost Analysis Summary					
Calculation	Options				
	Option 1 (1)	Option 2A (1)	Option 2B (1)	Option 3 (2)	
Net Present Value of Benefits (PVB)	$19,467,793	$19,467,793	$19,467,793	$13,992,658	(A)
Net Present Value of Costs (PVC)	$13,992,658	$24,291,061	$30,564,505	$20,108,283	(B)
Net Benefits	$5,475,135	$(4,823,268)	$(11,096,712)	$(6,115,625)	(A)-(B)
Summary	Benefits Outweigh Costs	Costs Outweigh Benefits	Costs Outweigh Benefits	Costs Outweigh Benefits	

(1) Net Present Value of Benefits include reduced user delay (travel time), user operating costs, and greenhouse gas emissions.

Net Present Value of Costs include applicable roadway and bridge construction, right of way/property acquisition, engineering and other fees, and future maintenance costs .

(2) Net Present Value of Benefits calculated as the cost savings of electing to not construct a new bridge as compared to Option 1.

Net Present Value of Costs include roadway and traffic calming construction, engineering and other fees, and maintenance costs as well as increased user delay (travel time), user operating costs, and greenhouse gas emissions.

5.0 Summary

A feasibility matrix was developed to aid in evaluating the options relative to the criteria previously established in this report. The table below compares the various options in a succinct visual aid to compare the options at a high level. The table presents how each option is compared relative to the base criteria in terms of feasibility, namely favorable (green), moderate (yellow), or poor (red). Based on importance of criteria to the City of Fargo and Clay County (individual "weight" of each criterion), an option can be selected to best move forward with.

North Broadway Bridge Replacement Option Comparison				
Options				
	Option 1	Option 2a	Option 2b	Option 3
Evaluation Criteria	Bridge at Existing Elevation	Bridge above 100-yr Existing Alignment	Bridge above 100-yr to Cul-de-sac	No Replacement
Impact/Benefit				
Vehicular and Pedestrian Mobility				
Geotechnical Risk				
Hydraulic Impacts				
Property Impacts				
Property Acquisition				
Permitting				
Clay County Preference				
Construction Costs				
B/C Analysis				
Estimated Construction Costs	**$15,225,000**	**$25,891,000**	**$34,696,000**	**$579,000**
Total Construction Costs with Fees & Engineering	**$20,333,000**	**$36,865,000**	**$46,400,000**	**$817,000**

Favorable
Moderate
Poor

6.0 Next Steps

This report will be presented to the City of Fargo Engineering Department and subsequently presented to the City Commission in some form. The Commission will ultimately decide which option is carried forward. It is anticipated this decision will be completed late in 2023. Based on the option chosen to move forward, various next steps should be considered.

If Option 3 is chosen, then the steps pertaining to roadway obliteration, signing, and traffic calming measures can be implemented with minimal future actions required. However, if Options 1, 2a, or 2b are chosen, then the following should be considered as next steps to continue the project:

6.1 Preliminary Survey and Geotechnical Analysis as part of preliminary design:

As noted previously, the feasibility report was based on LiDAR survey and preliminary geotechnical data available from nearby projects. Detailed survey and additional borings and analysis would be required to properly quantify the geotechnical impacts associated with each option.

Like the geotechnical analysis, once the survey is obtained and the final roadway and bridge geometrics are set, the hydraulic analysis should be revisited and updating for use in permit acquisition.

As noted previously, it is anticipated that the geotechnical, hydraulic, and other preliminary services would be completed as part of a preliminary engineering and environmental document phase. Permitting would also be started as part of this task. Assuming that the requirements of the environmental document are achieved and permitting can be obtained, the project could be carried forward for final design and estimated construction in 2026. If significant property purchases are required, starting that process as soon as the environmental document is approved is critical to achieve a 2026 construction start.

THE CITY OF Fargo FAR MORE

OFFICE OF THE MAYOR

DR. TIM MAHONEY
FARGO CITY HALL
225 Fourth Street North
Fargo, ND 58102
Phone: 701.241.1310 | Fax: 701.476.4136
FargoND.gov

MEMORANDUM

55

TO: BOARD OF CITY COMMISSIONERS

FROM: MAYOR TIMOTHY J. MAHONEY

DATE: DECEMBER 11, 2023

SUBJECT: APPOINTMENTS TO THE METRO FLOOD DIVERSION BOARD OF AUTHORITY & COMMITTEES

The Metro Flood Diversion Board of Authority requests that the City Commission appoint its representatives to the Metro Flood Diversion Board of Authority and Finance, Land Management, and Planning Committees. I am recommending the following appointments for 2024:

FM Diversion Board of Authority:
Mayor Timothy Mahoney
City Commissioner Dave Piepkorn
City Commissioner John Strand
City Commissioner Arlette Preston (alternate)

FM Diversion Finance Committee*:
Mayor Timothy Mahoney
City Commissioner Dave Piepkorn
City Administrator Michael Redlinger
Finance Director Susan Thompson

FM Diversion Land Management Committee*:
City Commissioner Arlette Preston
City Administrator Michael Redlinger
Assistant City Engineer Nathan Boerboom

FM Diversion Planning Committee:
Mayor Timothy Mahoney

**Per the Joint Powers Agreement, the Board of Authority confirms Member Entity appointments to the Finance and Land Management Committees.*
***Finance Committee members are appointed directly by the FM Diversion Board of Authority.*

Your favorable consideration of these recommendations will be greatly appreciated.

RECOMMENDED MOTION: To approve the appointment of members to the Metro Flood Diversion Board of Authority and Policy Committees for calendar year 2024 as outlined above.