

## FEASIBILITY REPORT

JEFFERSON HIGHWAY, ELM CREEK  
PARKWAY, AND SIGNALS PROJECT  
CHAMPLIN | HENNEPIN COUNTY | MINNESOTA

November 12, 2024

Prepared for:  
City of Champlin  
11955 Champlin Drive  
Champlin, MN 55316

CITY PROJECT NO. 22501  
SAP 193-114-006  
SAP 193-109-011  
WSB PROJECT NO. 026107-000



November 12, 2024

Honorable Mayor and City Council  
City of Champlin  
11955 Champlin Drive  
Champlin, MN 55316

Re: Feasibility Report  
Jefferson Highway, Elm Creek Parkway, and Signals Project  
City of Champlin Project No. 22501  
SAP 193-109-011 & SAP 193-114-006  
WSB Project No. 026107-000

Dear Honorable Mayor and City Council Members:

The enclosed feasibility report identified the recommended improvements, estimated cost, and proposed funding for the street and utility improvements of the urban major collectors of Jefferson Highway from the 109<sup>th</sup> Avenue N project limits to Elm Creek Parkway and Elm Creek Parkway from Jefferson Highway to U.S. Highway 169.

The project is proposed to be funded by special assessments to benefitting properties, Municipal State Aid funding, and City funding sources including the Capital Improvement Revolving Fund, Storm Sewer Fund, Water Revenue Fund, and Street Light Revenue Fund.

I am available at your earliest convenience to discuss this report. If you have any questions, please do not hesitate to call me at 612.219.3500.

Sincerely,

WSB



Jennifer Edison, PE  
Sr. Project Manager

Attachments

cc: Bret Heitkamp, City Administrator  
Heather Nelson, PE, City Engineer

kkp

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Letter of Introduction

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City of Champlin Project No. 22501  
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### Feasibility Report

Jefferson Highway, Elm Creek Parkway, and Signals Project

City of Champlin Project No. 22501

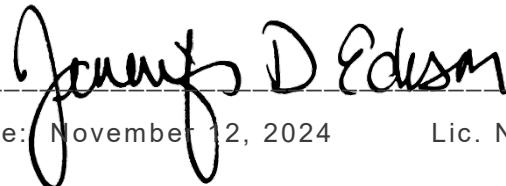
SAP 193-109-011 & SAP 193-114-006

WSB Project No. 026107-000

## Certification Sheet

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed professional engineer under the laws of the State of Minnesota.

Jennifer Edison, PE

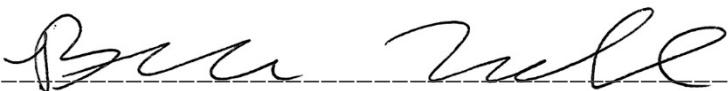


Date: November 12, 2024

Lic. No. 51721

Quality Control Review Completed By:

Brandon Movall, PE, ENV SP



Date: November 12, 2024

Lic. No. 60403

### Feasibility Report

Jefferson Highway, Elm Creek Parkway, and Signals Project  
City of Champlin Project No. 22501  
SAP 193-109-011 & SAP 193-114-006  
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Certification

## 1. Executive Summary

The City's Capital Improvement Plan identifies the rehabilitation of the urban major collectors of Jefferson Highway from the 109<sup>th</sup> Avenue N project limits to Elm Creek Parkway and Elm Creek Parkway from Jefferson Highway to U.S. Highway 169. Both Jefferson Highway and Elm Creek Parkway are Municipal State Aid designated routes.

These streets are experiencing deterioration with general pavement failure due to cracking and settlements. The streets in the project area were originally constructed between 1988 and 1993. Seal coating and crack filling have been completed on these streets since their original construction. Elm Creek Parkway also received a 1.5" edge mill and overlay in 2003. The total length of the streets is approximately 0.6 miles.

Based on the pavement condition evaluation, the proposed improvements include rehabilitation by mill and overlay. Curb and gutter and sidewalk will be replaced only where there are significant cracks or settlements. The existing street layout and widths will be maintained. Pedestrian ramps in the project area that are not currently compliant with ADA standards will be upgraded.

Existing street lighting at all signalized intersections was reviewed against current City Standards. Street lighting that is redundant or next to signal lights will be removed.

Traffic signal modifications will be made at the intersections of Jefferson Highway and White Oaks Trail and of Jefferson Highway and Elm Creek Parkway. Improvements will include a signal cabinet replacement, new signal cycles, and striping changes.

Stop signs will be replaced with new round posts. Street signs will be installed on top of the stop signs. All other impacted signs will be salvaged and reinstalled. No new mailboxes are proposed with the project.

**Figure 1** is **Appendix A** is a project location map for the street improvements.

The total estimated cost for the project is \$1,231,689 and includes a 10% contingency and 15% indirect costs for legal, engineering, administrative, and financing costs. The project is proposed to be funded with special assessments to benefiting property owners, Municipal State Aid funding, and City funding sources including the Capital Improvement Revolving Fund, Storm Sewer Fund, Water Revenue Fund, and Street Light Revenue Fund. The project is proposed to be completed in 2025.

The proposed improvements are feasible, necessary, and cost effective from an engineering standpoint and should be constructed as proposed herein.

## 2. Introduction

### 2.1 Authorization

The City's 2025 Capital Improvements Plan identifies the rehabilitation of Jefferson Highway from the 109<sup>th</sup> Avenue N project limits to Elm Creek Parkway and Elm Creek Parkway from Jefferson Highway to U.S. Highway 169. Also included in the City's Capital Improvement Plan are signal modifications on Jefferson Highway at both the intersections of Elm Creek Parkway and White Oaks Trail.

The City Council authorized the preparation of a feasibility study on July 8, 2024, to review the condition of the streets, drainage, signals, streetlights, and utilities and verify compliance with City Standards. This project is designated as City Project 22501. A project locations map is shown in **Figure 1** in **Appendix A**.

### 2.2 Scope

The scope for this report includes reviewing streets within the project limits for pavement condition, public utility needs, signal modifications, and ADA compliance.

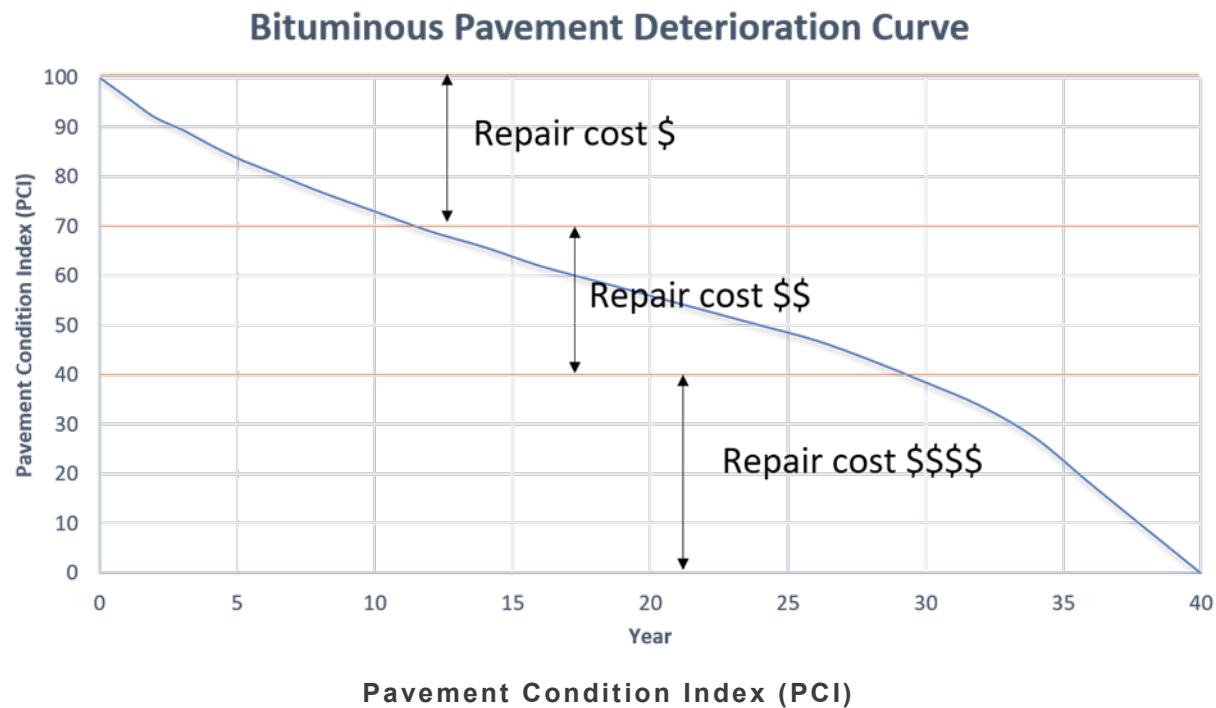
### 2.3 Pavement Management

The City of Champlin contracts with a private independent pavement management company, Goodpointe Technology Inc., to rate the condition of the City's streets. These ratings are completed on a three-year cycle with one third (1/3) of the City rated each year. The pavement rating, known as Pavement Condition Index (PCI), ranks pavements on a scale according to the amount of pavement deterioration that is visually evident. This information is one factor that is used in developing the City's Capital Improvement Plan and prioritization of projects.

#### 2.3.1. Pavement Life Cycle

All pavements will deteriorate over time. Typically, the pavement deterioration accelerates as it reaches the end of its lifespan. At first very few distresses are present, and the pavements stay in relatively good condition. As the pavement ages, more distresses develop, and the pavement deterioration is compounded. For instance, once a crack occurs, it is then easier for water to infiltrate the asphalt layer, penetrating the aggregate base and weakening the subgrade. This cycle is exacerbated by the freeze and thaw cycles. Some examples of typical pavement distresses include transverse and longitudinal cracking, block cracking, and alligator cracking.

The existing bituminous pavement condition for the streets in this study have been observed, deteriorations identified, and each street has been assigned a PCI value. The calculation of the PCI value for an individual street takes into account the area of distresses encountered as well as the severity of each distress. An evaluation has been completed on the local streets identified to be reviewed, and the calculations of the PCI are based on the data and methods as described in the "Pavement Maintenance Management System" prepared by the U.S. Army Corps of Engineers.



### 3. Existing Conditions

#### 3.1 Surface

The streets in the project area are urban major collector streets and were constructed between 1988 and 1993.

Improvements since initial construction have been nonstructural for Jefferson Highway and both nonstructural and structural for Elm Creek Parkway. Seal coating and crack filling has been completed on these streets since their original construction. Elm Creek Parkway received a 1.5" edge mill and overlay in 2003.

Jefferson Highway and Elm Creek Parkway are both Municipal State Aid designated routes. Based on 2023 traffic volume counts, Jefferson Highway has an annual average daily traffic (AADT) volume of 9,182 vehicles per day and Elm Creek Parkway has an average daily traffic volume of 11,229 vehicles per day.

The streets were most recently rated in 2022 with the PCI values shown in **Table 1** below.

**Table 1**

Existing PCI Values	
Street	PCI (Projected from 2022)
Jefferson Highway	46-78
Elm Creek Parkway (EB)	79
Elm Creek Parkway (WB)	55

The existing bituminous surface conditions in general exhibit surface deterioration with significant cracking. It is becoming brittle due to age and general wear and tear and is showing sign of accelerated deterioration. Examples of the existing bituminous pavement are shown in **Figure 4** in **Appendix A**.

A pavement Coring Report was completed by WSB in August of 2024 to determine the most cost-effective pavement rehabilitation improvement. Bituminous roadway cores were taken throughout the project. Pavement thicknesses range from 6.25 inches to 9 inches with 6 inches to 13+ inches of aggregate base. The cores from Jefferson Highway do not show any indication of raveling in the base course layer. The cores from Elm Creek Parkway show minimal raveling, indicating some preliminary roadway deterioration. The cores from The Coring Report can be found in **Appendix D**.

##### 3.1.1. Roadway Alignment

Jefferson Highway and Elm Creek Parkway have typical horizontal and vertical alignments for urban major collector streets. Jefferson Highway includes a region of superelevation around the curved portion of the road.

### **3.1.2. Right-of-Way**

The existing right-of-way widths for the project are 110-260 feet.

### **3.1.3. Street Section**

Jefferson Highway in the designated project area has an existing street width of 28-54 feet with a 6-18 foot median and consists of an urban section with parkway style curb and gutter. Elm Creek Parkway in the designated project area has an existing street width of 35-61 feet with a 6-20 foot median and consists of an urban section with parkway style curb and gutter. The street and median widths for both streets vary at intersections due to turn lanes.

## **3.2 Drainage**

Storm sewers currently exist throughout the project area. Drainage from the project area is conveyed by storm drains and storm sewer pipes to storm water ditches along U.S. Highway 169.

## **3.3 Watermain**

Watermain exists throughout the project area consisting of twelve and sixteen-inch ductile iron pipe constructed in 1987. According to the City's utility department, there have not been significant maintenance needs for the existing watermain due to limited watermain breaks or operational issues. Maintenance on gate valves in this area has shown that gate valves are in fair to good condition throughout the project area except for the gate valve in the northeast corner of the intersection of Jefferson Highway and Elm Creek Parkway, which is in poor condition.

## **3.4 Sanitary Sewer**

The only sanitary sewer present within the designated project area is a PVC pipe crossing Jefferson Highway north of Hillsboro Avenue N. There are no sanitary manholes within the designated project area.

## **3.5 Street Lighting**

Streetlights exist within the project area are primarily located at street intersections. The majority of the streetlights are city-owned, with one privately owned streetlight on the southeast corner of the intersection of Jefferson Highway and Commerce Drive N and two privately owned streetlights on both sides of the intersection of Elm Creek Parkway and Jefferson Court N.

## **3.6 Traffic Signals and Striping**

Traffic signals are currently located at the intersections of Jefferson Highway and Commerce Drive N, and Jefferson Highway and Elm Creek Parkway within the designated project area. The current signal cycles do not optimize the traffic flow at these intersections and traffic volumes do not necessarily warrant dual left turn lanes.

The intersection of Jefferson Highway/Elm Creek Parkway is currently configured with the following lanes:

- North leg: two designated left turn lanes, and a dual thru/right turn lane.
- West leg: one designated left lane, one designated thru lane, and a dual thru/right turn lane.
- South leg: two designated left turn lanes, one designated thru lane, and one designated right turn lane.
- East leg: two designated left turn lanes, two designated thru lanes, and one designated right turn lane.

The intersection of Jefferson Highway/White Oaks Trail N is configured with the following lanes:

- North leg: one designated left lane, one designated thru lane, and a dual thru/right turn lane.
- West leg: one dual left/thru lane, and designated right turn lane.
- South leg: designated left turn lane, two designated thru lanes, and designated right turn lane.
- East leg: one designated left turn lane, and a dual thru/right turn lane.

### **3.7 Sidewalks and Trails**

There's a five-foot concrete sidewalk on the west side of Jefferson Highway within the designated project limits. There's an eight-foot concrete sidewalk on the east side of Jefferson Highway from 275 feet southwest of Commerce Drive N to Elm Creek Parkway. There's a 10-foot bituminous trail on the north side of Elm Creek Parkway within the designated project limits.

### **3.8 Criteria for investigating**

The streets identified to be reviewed for improvements will be reviewed against current City Standards and policy where applicable.

#### **3.8.1. Streets**

Mill and overlay is a rehabilitation effort that is completed on streets with a PCI ranging from 60 to 90. Mill and overlays are not practical on streets where the existing bituminous section is less than three and a half inches because a standard two-inch mill and overlay would remove all of the existing pavement section. This would not leave enough remaining pavement to provide a base for the overlay.

Reclamation or reconstruction are street reconstruction efforts that are completed on streets with a PCI ranging from 0 to 60.

PCI ratings are not the only factors in determining a street rehabilitation method. The geotechnical analysis provides a more detailed measure of the pavement layer condition, bonding and structural integrity and the resulting improvement method. Geotechnical analysis provides a recommendation for pavement section and soil corrections needed on the project based on MnDOT FlexPave granular equivalency.

### **3.8.2. Drainage**

West Mississippi Watershed Management Commission Standards and MS4 permit standards will be utilized for storm water management and water quality design.

### **3.8.3. Watermain**

Ten State Standards will be utilized for watermain design.

### **3.8.4. Street Lighting**

Current City policy and practice for street light improvements utilize a decorative post with a lantern style luminaire. The standard streetlight for major street intersections utilizes a 30-foot pole and 200-watt luminaire. Luminaires are light-emitting diodes (LEDs).

### **3.8.5. Traffic Signals and Striping**

Turning movement counts will be collected at the two signalized intersections and peak hour turning movement volumes will be evaluated to determine whether the traffic operations can be modified to optimize traffic flow

### **3.8.6. Sidewalks and Trails**

In accordance with the Americans with Disabilities Act (ADA), all pedestrian curb ramps within the project area must be reconstructed to current ADA standards.

## 4. Proposed Improvements

### 4.1 Surface

Based on pavement analysis and the pavement Coring Report, the streets within the project area are proposed to be rehabilitated utilizing a bituminous mill and overlay and repaved with bituminous pavement. Mill and overlay improvements consist of removing a portion of the existing bituminous pavement and replacing the pavement with a new layer of bituminous asphalt. All streets in the project area will have spot curb replacement as necessary.

A preliminary layout for all street improvements is shown on **Figure 2** in **Appendix A**.

#### 4.1.1. Roadway Alignment

The proposed improvements will maintain the existing vertical and horizontal alignments of the streets within the project area.

#### 4.1.2. Right-of-Way

The main roadway improvements are located within the platted right-of-way. Temporary easements will be required for side street tie-ins. No permanent easements will be required.

#### 4.1.3. Street Section

The proposed street bituminous overlay consists of a single lift of bituminous pavement at two inches (2"). The existing street width will be maintained. The existing curb consists of parkway style curb and will be maintained. Curb that is cracked, sunken, or offset will be evaluated and replaced as needed with the project. The proposed street typical sections are shown on **Figure 3** in **Appendix A**.

Stop signs will be replaced with new round posts. Street signs will be installed on top of the stop signs. All other impacted signs will be salvaged and reinstated.

No mailboxes are anticipated to be impacted by this project.

Yard areas disturbed will be replaced with sod or hydroseed, depending on the area of the disturbance.

### 4.2 Drainage

One new storm sewer structure is proposed with this project to improve the flow of water across the intersection of Jefferson Highway and Elm Creek Parkway. Other structures in the intersection and along Elm Creek Parkway are proposed to receive ring repairs or entirely new castings.

## 4.3 Watermain

Watermain gate valves will be adjusted to match the proposed pavement surface. The gate valve on the northeast corner of the intersection of Jefferson Highway and Elm Creek Parkway is proposed to be removed and replaced. No other utility improvements on the watermain system have been identified to be completed with the project.

## 4.4 Street Lighting

The street light on the south side of Elm Creek Parkway between Jefferson Highway and U.S. Highway 169 will be removed. No street lights are proposed to be added with this project.

## 4.5 Traffic Signals and Striping

The southbound lanes of Jefferson Court N are proposed to be changed from a right/through-left-left configuration to a right-through-left configuration to eliminate the second turn lane. The left turn lane on Jefferson Highway north of the intersection with Hillsboro Ave N is proposed to be striped to prohibit the use of the turn lane since it does not currently provide access to any driveways.

Signal modifications are proposed to provide flashing yellow arrow (FYA) signal indications at the intersections of Jefferson Highway with White Oaks Trail and Elm Creek Parkway, and to accommodate the proposed change in striping geometry for the southbound approach of the intersection of Jefferson Highway and Elm Creek Parkway to a right-through-left. A proposed signal improvements memo can be found in **Appendix E**.

## 4.6 Sidewalks and Trails

Sidewalk sections that are broken, sunken, or offset will be repaired. Pedestrian curb ramps at sidewalks and trails will be reconstructed to current ADA standards.

## 4.7 Permits/Approvals

The anticipated permits and approvals required from the respective regulatory agencies are listed below:

- MnDOT Right-of-Way

## 5. Financing

### 5.1 Opinion of Probable Cost

The total project cost is estimated at **\$1,231,689** and includes all proposed improvements as well as a 10% contingency factor and 15% for indirect project costs, which includes engineering, legal, administrative, and financing costs. A detailed Opinion of Probable Cost can be found in **Appendix B**.

The Opinion of Probable Cost is summarized as follows:

<b>Jefferson Highway, Elm Creek Parkway, and Signal Project Opinion of Probable Cost</b>	
	<b>Estimated Cost</b>
State Aid Surface Improvements	\$949,744
Local Surface Improvements	\$73,271
Local Drainage Improvements	\$34,863
Watermain Improvements	\$8,855
Lighting Improvements	\$506
Signal Improvements	\$164,450
<b>TOTAL</b>	<b>\$1,231,689</b>

### 5.2 Funding

The proposed funding for the improvements consists of a combination of Municipal State Aid Funds, City funds, and special assessments to benefitting properties.

Assessments will be levied to the benefitting properties as outlined in Minnesota Statute 429 and the City's assessment policy. Commercial properties that have private streets that directly access Jefferson Highway or Elm Creek Parkway, as well as commercial properties that have frontage on Jefferson Highway or Elm Creek Parkway are proposed to be assessed based on the area of the property.

#### 5.2.1 Commercial Properties

Jefferson Court and Commerce Drive N are both private streets that provide access to Elm Creek Parkway and Jefferson Highway for six commercial properties. Two of the commercial properties on Jefferson Court have frontage abutting the Elm Creek Parkway and were assessed in 2021 with the Elm Creek Parkway Improvement Project. These two properties are at 11469 Jefferson Court and 11431 Jefferson Court. The remaining three commercial properties on Jefferson Court have frontage east of the project limits and will be assessed as part of this project. The assessments to these commercial properties are calculated on a per unit basis for the base square foot cost to mill and overlay the portion of the side of Jefferson Highway/Elm Creek Parkway (from Jefferson Highway to TH 169) that fronts the property. Average pavement area is based on ninety feet (90') of frontage and half of the width of a forty-two-foot (42') typical residential street. For a standard forty-two-foot (42') residential street, half the bituminous section is nineteen and one-half feet (19.5') wide. Below is a summary of the assessment rates based on distributing the costs by prorating units across a project cost per area. This is

consistent with past and current City assessment practices and the method is identified in the City of Champlin 2003 Assessment Policy.

$$\frac{\$5.30}{SF} \times 90\ ft \times 19.5\ ft = \$9,309.93\ per\ Unit$$

The number of assessable units the commercial properties were determined by taking the area to a depth of 165 feet along the street fronting the project and dividing by the typical lot size (14,434 SF), rounding to the nearest whole unit. Collectively, the fourteen commercial properties were determined to have 34 units. The number of units assessed to each commercial property is determined by the ratio of the area of the individual parcel to the total area of the development it is part of, multiplied by the number of units calculated for the development.

The assessment term is proposed to be 5 years with an interest rate that will be set at the assessment hearing using the prime rate in effect on August 1, 2025, plus one percent. There are 14 parcels proposed to be assessed within the project area. A preliminary assessment roll identifying proposed assessments is located in **Appendix C**.

Other funding sources for the project are Municipal State Aid Funds as well as City funds including the Capital Improvement Revolving Fund and Street Light Revenue Fund.

The project funding is summarized as follows:

<b>Jefferson Highway, Elm Creek Parkway, and Signal Project Project Funding Summary</b>	
<b>Funding Source</b>	<b>Proposed Funding</b>
Special Assessments	\$316,519
Municipal State Aid Funds	\$706,496
Capital Improvement Fund	\$164,450
City Storm Revenue Fund	\$34,863
City Water Revenue Fund	\$8,855
City Street Lighting Fund	\$506
<b>TOTAL</b>	<b>\$1,231,689</b>

## 6. Legal Description

The legal description for the Jefferson Highway, Elm Creek Parkway, and Signal Project is:

All parcels adjacent to Jefferson Highway from 10925 Jefferson Circle N to Elm Creek Parkway and all parcels adjacent to Elm Creek Parkway from Jefferson Highway to U.S. Highway 169, City of Champlin, Hennepin County, Minnesota.



## 7. Neighborhood Meeting

A Neighborhood Open House for the Jefferson Highway, Elm Creek Parkway, and Signal Project was held on October 22, 2024. Preliminary information was presented to attendees regarding the proposed improvements, costs, funding, schedule, and impacts associated with the project. Residents were encouraged to leave comment cards or email the City's general email with any comments on the project. No comments were submitted by residents regarding this project.



## 8. Project Schedule

The proposed schedule for this improvement is as follows:

Task Number	Task Description	Completion Date
1	City Approves Consultant Contract	July 8, 2024
2	City Authorizes Feasibility Report	July 8, 2024
3	Neighborhood Information Meeting	October 22, 2024
4	City Receives Feasibility Report	November 12, 2024
5	Public Hearing	November 12, 2024
6	Final Design	November 2024 – January 2025
7	Advertise for Bids	February 2025
8	Award Contract	March 2025
9	Neighborhood Meeting Prior to Start of Construction	April/May 2025
10	Construction	May 2025 – September 2025
11	Substantial Completion	September 2025
12	Assessment Hearing	October 2025
13	Final Completion	June 2026
14	First Payment Due with 2026 Taxes	May 2026

### Feasibility Report

Jefferson Highway, Elm Creek Parkway, and Signals Project  
City of Champlin Project No. 22501  
SAP 193-109-011 & SAP 193-114-006  
WSB Project No. 026107-000

## 9. Conclusions and Recommendations

1. The identified streets have experienced surface deterioration with significant cracking and settlement areas.
2. The City's Pavement Management Program includes pavement ratings that identify street reconstruction as the best rehabilitative measure for the project area. Pavement analysis by soil borings identified pavement section deterioration. Based on the above factors, the recommended pavement rehabilitation method for the project area is a mill and overlay with spot curb and sidewalk replacement.
3. It is the recommendation of WSB and City staff that the City Council accept this feasibility report and call for a public hearing on the proposed improvements consistent with Minnesota State Statute No. 429 governing public improvements. Based on the information contained within this report, the proposed improvements as described can be considered to be necessary, cost-effective, and feasible from an engineering standpoint.



## Appendix A

**Figure 1 – Project Location Map**

**Figure 2 – Preliminary Layout**

**Figure 3 – Typical Sections**

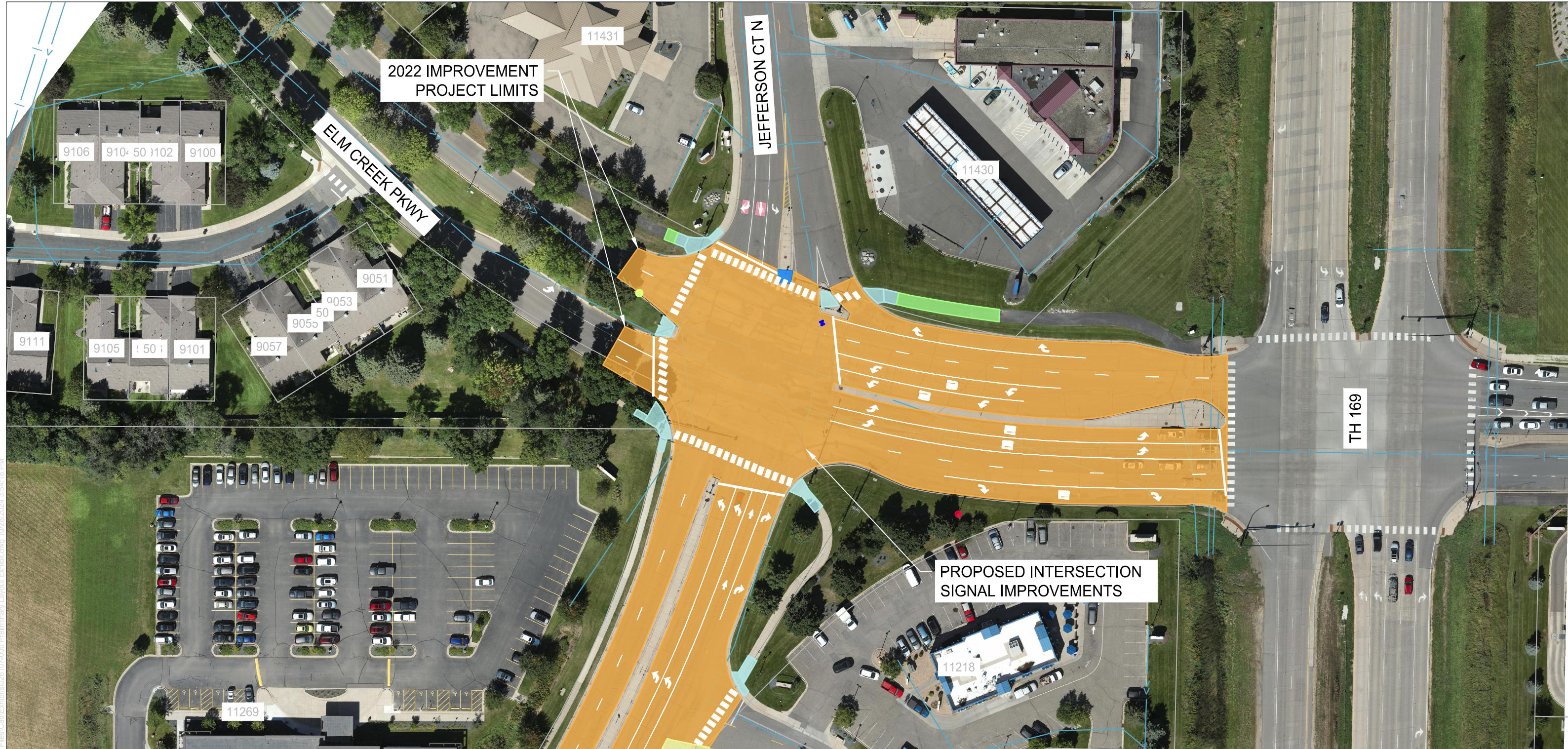
**Figure 4 – Existing Pavement Examples**

**Feasibility Report**

**Jefferson Highway, Elm Creek Parkway, and Signals Project**  
**City of Champlin Project No. 22501**  
**SAP. 193-109-011 & SAP 193-114-006**  
**WSB Project No. 026107-000**

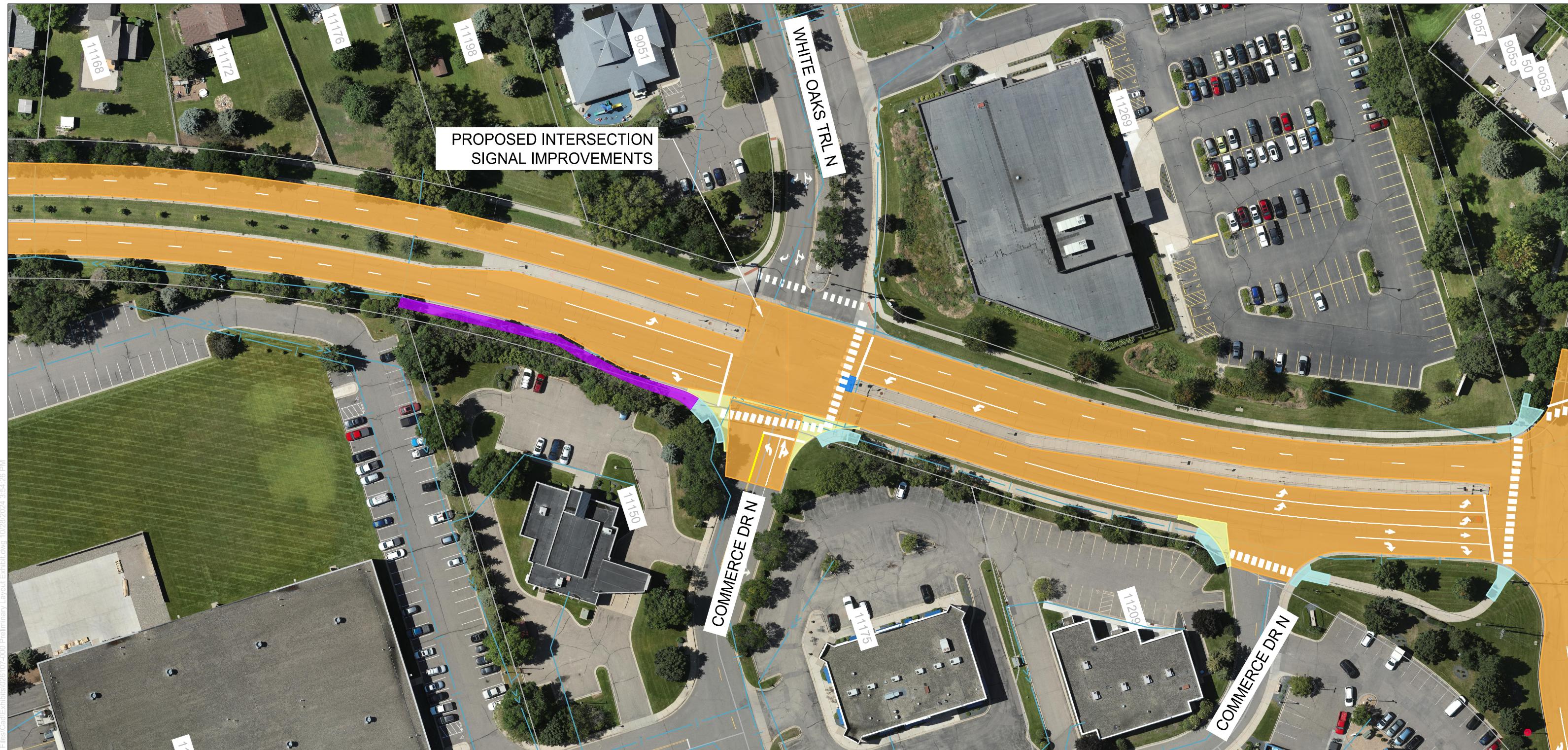
**Appendix**





#### LEGEND

	EXISTING SANITARY SEWER		SHORTEN MEDIAN FOR PEDESTRIAN CROSSING		PROPOSED STORM SEWER
	EXISTING STORM SEWER		COMMERCIAL VALLEY GUTTER AND APRON REPLACEMENT		PROPOSED GATE VALVE
	EXISTING WATERMAIN		BITUMINOUS TRAIL REPLACEMENT		PROPOSED STRIPING
	REMOVE STREET LIGHT		CONCRETE WALK REPLACEMENT		REMOVE PAVEMENT MARKINGS
	BITUMINOUS ROAD MILL AND OVERLAY		CONCRETE WALK REMOVAL		



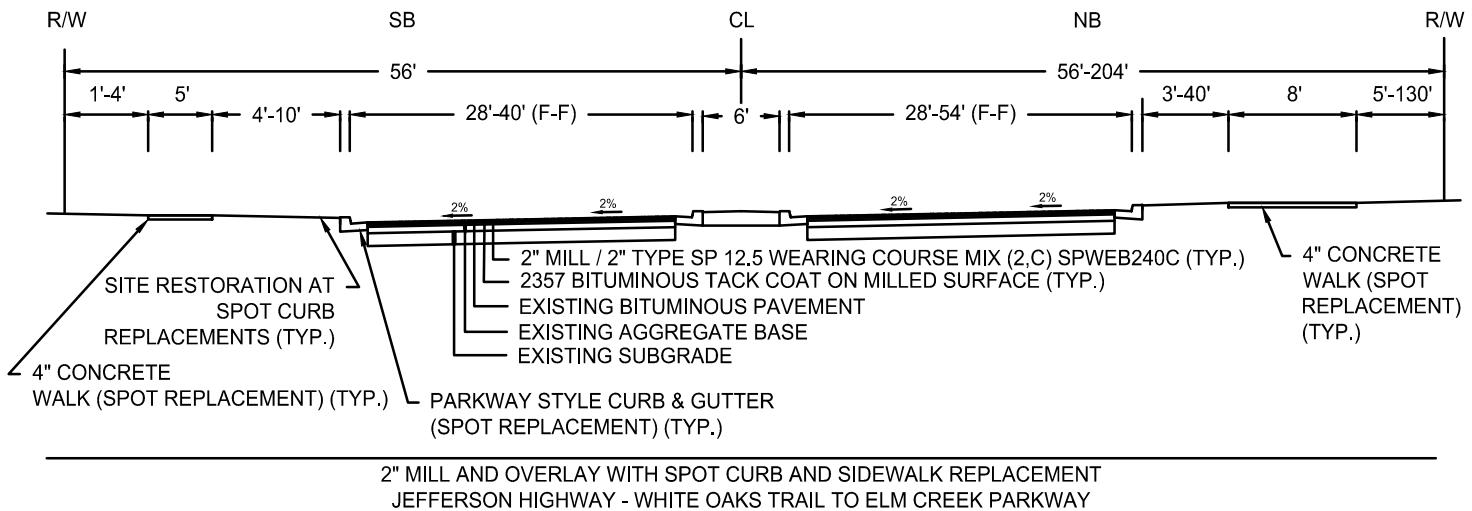
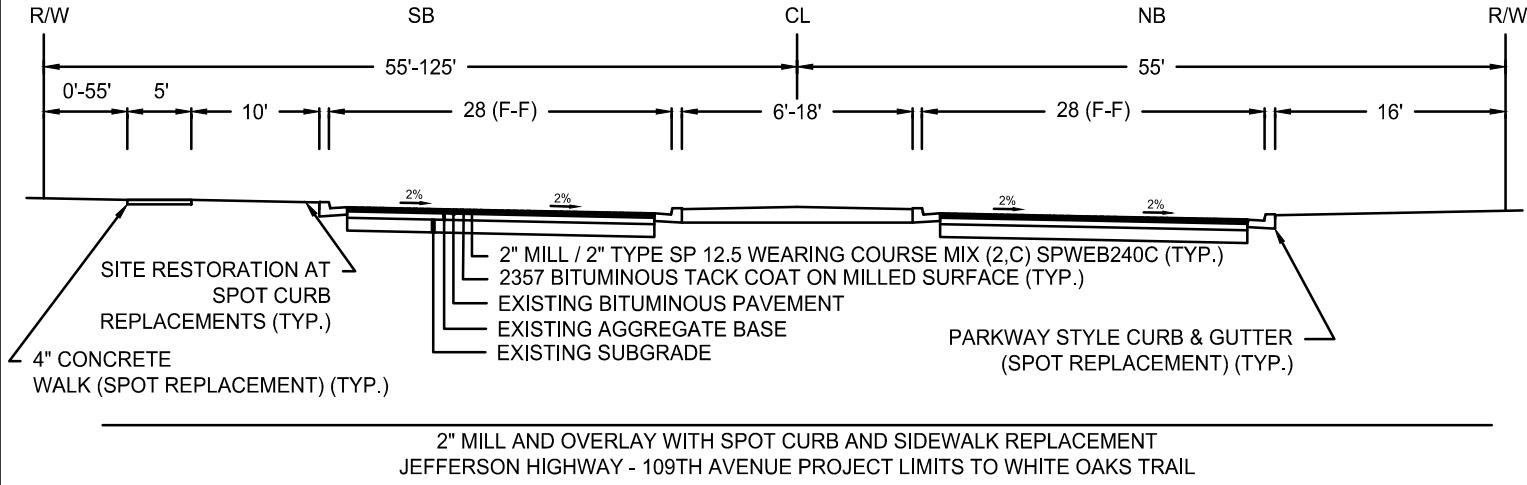
JEFFERSON HIGHWAY, ELM CREEK PARKWAY, AND SIGNALS PROJECT  
FIGURE 2 - PRELIMINARY LAYOUT  
CITY OF CHAMPLIN, MN

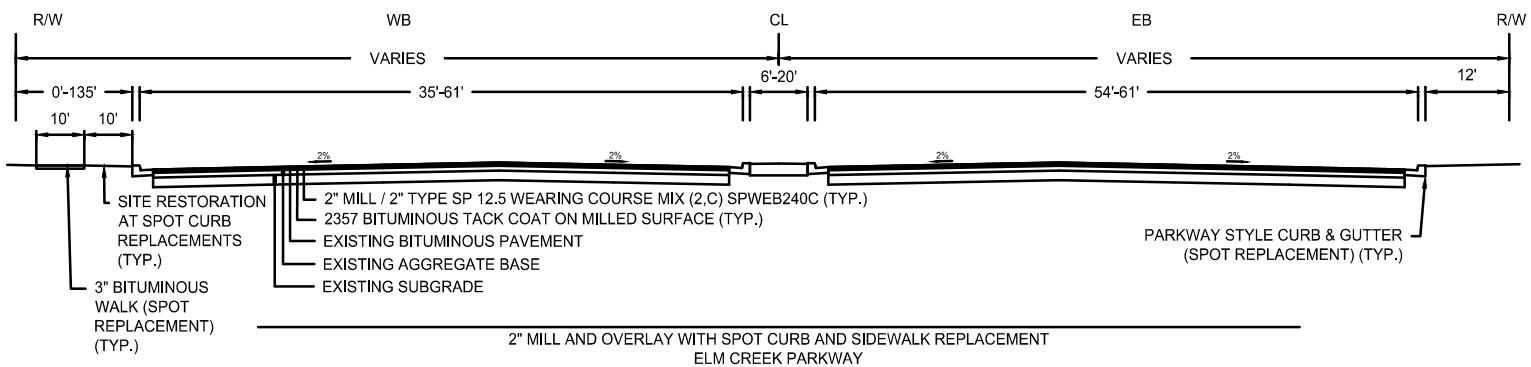


#### LEGEND

	EXISTING SANITARY SEWER		SHORTEN MEDIAN FOR PEDESTRIAN CROSSING		PROPOSED STORM SEWER
	EXISTING STORM SEWER		COMMERCIAL VALLEY GUTTER AND APRON REPLACEMENT		PROPOSED GATE VALVE
	EXISTING WATERMAIN		BITUMINOUS TRAIL REPLACEMENT		PROPOSED STRIPING
	REMOVE STREET LIGHT		CONCRETE WALK REPLACEMENT		REMOVE PAVEMENT MARKINGS
	BITUMINOUS ROAD MILL AND OVERLAY		CONCRETE WALK REMOVAL		









JEFFERSON HWY AND  
WHITE OAKS N



JEFFERSON HWY AND  
ELM CREEK PKWY



JEFFERSON HWY



JEFFERSON HWY



JEFFERSON HWY



JEFFERSON HWY  
SIDEWALK



ELM CREEK PKWY  
TURN LANE



ELM CREEK PKWY AND  
JEFFERSON HWY



## Appendix B

### Opinion of Probable Cost

## OPINION OF PROBABLE COST

WSB Project: JEFFERSON HIGHWAY, ELM CREEK PARKWAY, AND SIGNALS PROJECT  
Project Location: CITY OF CHAMPLIN, MN  
City Project No.: 22501  
WSB Project No: 026107-000

<i>Design By:</i>	HRD
<i>Checked By:</i>	JDE
<i>Date:</i>	11/1/2024

<b>C. LOCAL DRAINAGE IMPROVEMENTS</b>						
54	2104.502	REMOVE CASTING	EACH	11	\$ 100.00	\$ 1,100.00
55	2104.503	REMOVE SEWER PIPE (STORM)	LF	8	\$ 15.00	\$ 120.00
56	2503.503	18" RC PIPE SEWER DES 3006 CL V	LF	4	\$ 110.00	\$ 440.00
57	2503.602	CONNECT TO EXISTING STORM SEWER	EACH	2	\$ 800.00	\$ 1,600.00
58	2506.502	ADJUST FRAME & RING CASTING	EACH	2	\$ 1,000.00	\$ 2,000.00
59	2506.502	CASTING ASSEMBLY	EACH	11	\$ 1,300.00	\$ 14,300.00
60	2506.503	CONST DRAINAGE STRUCTURE DES 48-4020	LF	10	\$ 800.00	\$ 8,000.00
				<b>CONSTRUCTION TOTAL</b>	\$ 27,560.00	
				<b>CONTINGENCY TOTAL (10%)</b>	\$ 2,756.00	
				<b>SUBTOTAL</b>	\$ 30,316.00	
				<b>INDIRECT COST TOTAL (15%)</b>	\$ 4,547.40	
				<b>TOTAL</b>	\$ 34,863.00	
<b>D. WATERMAIN IMPROVEMENTS</b>						
61	2104.502	REMOVE GATE VALVE & BOX	EACH	1	\$ 1,000.00	\$ 1,000.00
62	2504.602	8" GATE VALVE & BOX	EACH	1	\$ 6,000.00	\$ 6,000.00
				<b>CONSTRUCTION TOTAL</b>	\$ 7,000.00	
				<b>CONTINGENCY TOTAL (10%)</b>	\$ 700.00	
				<b>SUBTOTAL</b>	\$ 7,700.00	
				<b>INDIRECT COST TOTAL (15%)</b>	\$ 1,155.00	
				<b>TOTAL</b>	\$ 8,855.00	
<b>E. LIGHTING IMPROVEMENTS</b>						
63	2104.502	REMOVE LIGHTING UNIT	EACH	1	\$ 400.00	\$ 400.00
				<b>CONSTRUCTION TOTAL</b>	\$ 400.00	
				<b>CONTINGENCY TOTAL (10%)</b>	\$ 40.00	
				<b>SUBTOTAL</b>	\$ 440.00	
				<b>INDIRECT COST TOTAL (15%)</b>	\$ 66.00	
				<b>TOTAL</b>	\$ 506.00	
<b>F. SIGNAL IMPROVEMENTS</b>						
64		SIGNAL MODIFICATIONS	LS	1	\$ 130,000.00	\$ 130,000.00
				<b>CONSTRUCTION TOTAL</b>	\$ 130,000.00	
				<b>CONTINGENCY TOTAL (10%)</b>	\$ 13,000.00	
				<b>SUBTOTAL</b>	\$ 143,000.00	
				<b>INDIRECT COST TOTAL (15%)</b>	\$ 21,450.00	
				<b>TOTAL</b>	\$ 164,450.00	
				<b>GRAND TOTAL</b>	\$ 1,231,689.00	

**DISCLAIMER:**

In review of this Opinion of Probable Cost, the Client understands that the Consultant has no control over the availability of labor, equipment or materials, market conditions, or the Contractor's method of pricing. This Opinion of Probable Cost is made on the basis of the Consultant's professional judgment and experience. The Consultant makes no warranty, expressed or implied, regarding the ultimate bids or negotiated cost of the Work.



## Appendix C

### Assessment Map Preliminary Assessment Roll



**PRELIMINARY ASSESSMENT ROLL**  
**JEFFERSON HIGHWAY, ELM CREEK PARKWAY, AND SIGNALS PROJECT**

Date: 11/1/2024  
 WSB Project No.: 026107-000

ID	PID NO	OWNER NAME	BLDG_NUM	ADDRESS	MAILING ADDRESS	CITY	ST	ZIP CODE	NO. UNITS	MILL AND OVERLAY STREET	
									RESID.	\$	
1	3112021240073	CHENS 668 PROPERTY LLC	11452	JEFFERSON CT N	21873 MAJESTIC DR	ST. AUGUSTA	MN	55320	COMMERCIAL	1.20	\$11,172
2	3112021240074	HEARTLAND PROPS BLAINE LLC	11438	JEFFERSON CT N	10087 DOGWOOD ST NW	COON RAPIDS	MN	55448	COMMERCIAL	0.99	\$9,245
3	3112021240075	CSP MN DST	11430	JEFFERSON CT N	C/O CONTINENTAL GROUP, 1907 WAYZATA BLVD #250	WAYZATA	MN	55391	COMMERCIAL	1.46	\$13,602
4	3112021310018	K-BERGER 10 LLC	11218	COMMERCE DR N	ATTN PETE SPOHN, 7320 EASTMAN AVE	MIDLAND	MI	48642	COMMERCIAL	1.12	\$10,390
5	3112021310022	LAST BUT NOT LEASED LLC	11209	COMMERCE DR N	14513 CLOQUET ST	DAYTON	MN	55327	COMMERCIAL	0.27	\$2,467
6	3112021310023	TEJ PROPERTIES LLC	11217	COMMERCE DR N	7074 BROOKLYN BLVD	BROOKLYN CENTER	MN	55429	COMMERCIAL	0.27	\$2,467
7	3112021310024	BECHARD CHIROPRACTIC P A	11225	COMMERCE DR N	11225 COMMERCE DR N	CHAMPLIN	MN	55316	COMMERCIAL	0.27	\$2,467
8	3112021310017	LOIS V LLC	11190	COMMERCE DR N	320 EDGEWOOD AVE N	GOLDEN VALLEY	MN	55427	COMMERCIAL	0.92	\$8,537
9	3112021310020	PIONEER ACRES INC	11175	COMMERCE DR N	C/O COPPERWOOD MANAGEMENT, 18258 MINNETONKA BLVD #205	WAYZATA	MN	55391	COMMERCIAL	1.32	\$12,308
10	3112021310016	WODZIAK FAMILY PTRNSHP LP	11186	COMMERCE DR N	ATTN: ERIKA JOHNSON, 11186 COMMERCE DR	CHAMPLIN	MN	55316	COMMERCIAL	1.11	\$10,334
11	3112021310014	11150 COMMERCE DR LLC	11150	COMMERCE DR N	C/O KEITH CASTONGUAY, 11150 COMMERCE DR N	CHAMPLIN	MN	55316	COMMERCIAL	1.35	\$12,596
12	3112021310015	11132 COMMERCE LANE LLC	11132	COMMERCE LN N	7641 DALLAS LANE N	MAPLE GROVE	MN	55311	COMMERCIAL	1.08	\$10,092
13	3112021310021	GKI IDUSTRIAL MPLS LLC	11100	JEFFERSON HWY N	C/O INVESTCORP INT'L REALTY, 280 PARK AVENUE 36TH FL WEST	NEW YORK	NY	10017	INDUSTRIAL	9.57	\$89,087
14	3112021340006	B9 CHAMPLIN DC LLC	9000	109TH AVE N	C/O LINK LOGISTICS, P O BOX 2980	CHICAGO	IL	60690	INDUSTRIAL	13.08	\$121,755
										34	\$316,519



## Appendix D

### Coring Report



## Pavement Investigation Report

To: City of Champlin  
11955 Champlin Dr  
Champlin, MN, 55316

Date: August 27, 2024

Re: Pavement Investigation  
Jefferson Hwy Street Improvements  
R-026107-000

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WSB is pleased to submit this report detailing the results of our field pavement investigation and recommendations for pavement rehabilitation.

Our field investigation included documenting the existing pavement conditions, obtaining pavement cores, power or hand auger drilling through any existing aggregate base and measuring and visually classify both the aggregate base and the immediate underlying subbase or subgrade material.

Based on the field data obtained and summarized in our report, we are providing recommendations on reconstruction or rehabilitation techniques that we feel would be both viable and bring the most value to meet the project goals. The recommendations provided are based solely on our understanding of those goals. Therefore many other pavement rehabilitation techniques may also be feasible.

An aerial map with the approximate core locations and a summary table of the field data obtained at each location are presented in this report. Photographs of the pavement cores obtained, along with photographs of the existing pavement surface conditions at those locations can be found in the **Appendix**.

We appreciate the opportunity to provide our professional services as part of your project and we look forward to working with you again.

If you have any questions about this report or the recommendations it contains, please don't hesitate to contact us.

Sincerely,

Matt Indihar, PE  
Pavement Management  
[mindihaar@wsbeng.com](mailto:mindihaar@wsbeng.com)  
218.341.3614

Sam Lundquist  
Pavement Management  
[slundquist@wsbeng.com](mailto:slundquist@wsbeng.com)  
612.214.5949

### Project Understanding:

We understand the City of Champlin is seeking to improve their existing bituminous pavements at Jefferson Hwy from Elm Creek Pkwy to 109<sup>th</sup> Ave N through reconstruction or rehabilitation construction techniques. Our services were requested to aid the design team in preparing projects plans and specifications. The proposed pavement rehabilitation area includes Jefferson Hwy from Elm Creek Pkwy to 109<sup>th</sup> Ave N. We have assumed the roadway receives standard daily traffic for a commercial I through street.

### Field Exploration:

WSB performed the field exploration outlined in this report on July 20, 2024. A total of twelve (12) locations were cored and bored within the proposed pavement rehabilitation area. Precise core locations were selected to best represent the pavement condition in the vicinity surrounding the core. The approximate locations investigated and presented in this report are shown in **Figure 1**.

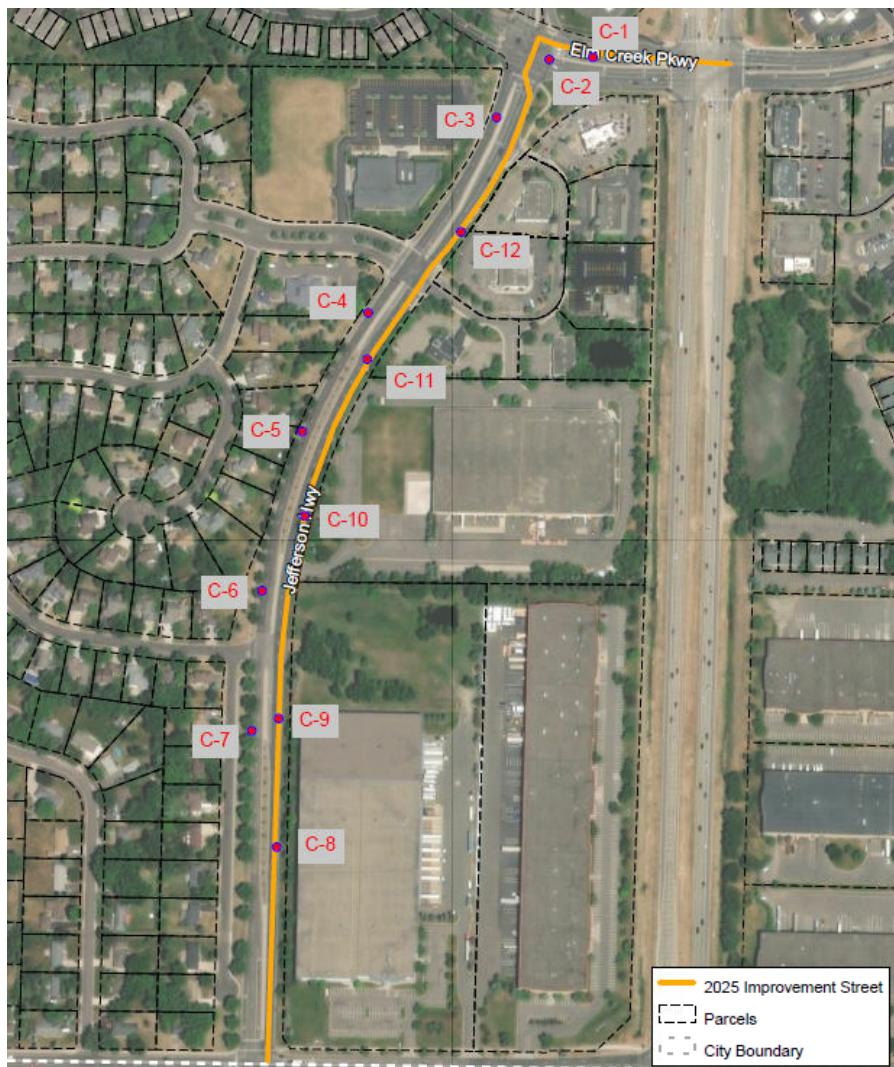


Figure 1: Core Location Map

### **Summary of Field Exploration:**

The twelve (12) cores obtained in this area had bituminous depths ranging from 6 inches to 9 inches, with a wear or top lift ranging from 1.25 inches to 2.25 inches with 3+ lifts of material at each location. The condition of each core and its apparent lifts of asphalt were classified based on condition, and the condition of the cores and lifts ranged from poor to good condition with poor cores exhibiting raveling and cracking. The aggregate base appeared to be sand with trace gravel, brown in color, and ranged in depths from 6 inches to greater than 12 inches. The subbase in general was identified as fine-medium grained sand, brown in color. Locations 5-12 hand augers were performed to 12" in depth with no apparent change in material. The pavement in the Project Area exhibited various amounts of surface stripping and transverse and longitudinal cracking throughout. Refer to field notes for more detailed distresses for each sample location.

Our Field Data is further detailed in **Table 1** and the **Photo Log** located in the Appendix.

### **Recommendations for Rehabilitation:**

Based on the conditions of the existing bituminous and subsurface data gathered by WSB, we are recommending two rehabilitation techniques be considered.

#### *Jefferson Hwy and Elm Creek Pkwy Intersection*

Due to extensive surface deterioration and raveling throughout the cores we recommend a full depth pavement removal and replacement. This would include the complete removal and disposal of the existing bituminous pavements.

While complete pavement removal and replacement will optimize the performance of the intersection, we understand the remainder of the improvements to Jefferson Hwy include a mill and overlay, which are improvements that will extend the life of the pavement. Therefore an alternate improvement option to this intersection would be to continue the mill and overlay throughout and provide patching in specific areas as needed.

#### *Jefferson Hwy from Elm Creek Pkwy to 109<sup>th</sup> Ave N*

Since the base lift of pavement in each sample location through this area was classified and being in good or fair condition, one option available to the city is a mill and overlay. This would involve grinding off a portion of the in-place asphalt surface and replacing it with a new bituminous wearing course over the entire surface. A mill and overlay may only eliminate some of the surface distresses, thus it is common to see cracks reflecting through the new pavement within a few years. However, this option provides a new driving surface while utilizing the existing lift in the bottom portion of the pavement. It is important to note that additional patching would be anticipated on areas with thinner bituminous that may be encountered once the surface is milled. We recommend that the milling be between 1.5 inches and 2 inches and replaced with a 2-inch wear course. WSB can provide additional information on best practices for mill/overlay and pavement replacement projects if needed.

The deciding factor between these possible options may be largely dependent on the price difference at the time of bidding, project timelines and contractor availability. Both options presented should provide a long-term solution with similar maintenance requirements and total life expectancies.

**Key Considerations:**

The import or export of any excess base aggregates associated with the recommended rehabilitation techniques should be considered. The quantity will be highly dependent on designed profiles and structure limitations such as utility structures and any adjacent curb/gutter or driveway tie in elevations.

Any unstable base soils discovered during a test roll would likely require sub cutting and replacement. Potential costs associated with these corrections should be anticipated.

**Pavement Design:**

The new bituminous pavement section and pavement mix type should be designed and specified by a Civil Engineer in consideration of the loads, climate, desired life expectancy and other key factors. If requested, WSB can provide a pavement design for this project.

**Limitations:**

The field data presented should be considered approximate and only valid for the location investigated. We have assumed smooth transitions of the similar materials between locations when formulating the recommendations provided.

Our recommendations are based solely on the data obtained through our limited field investigations and our experience with similar reconstructive and rehabilitation work for the locale. We consider local contractor experience and industry costs associated with the various rehabilitation techniques available in conjunction with project specific details.

**Appendix:**

- Table 1 Existing Pavement Section Details
- Photographs of Cores
- Photographs of Existing Surface Condition

# **Appendix**

**Table 1: Existing Pavement Section Details**

Core ID	Location	Number of Lanes	Pavement Width (ft)	Curb and Gutter	Surface Distresses	Bituminous Depth (in)	Lift Thickness (in) and Condition	Base Depth and Description	Subbase or Subgrade Description
1	Elm Creek Parkway West Bound	4	58	Yes	Surface stripping, Transverse Cracking, Some longitudinal cracking	9	2.25" - Wear (3+ Lifts of Material) Poor - Raveling	6" - Sand trace gravel, brown	f-m Sand, Brown
2	Elm Creek Parkway & Jefferson Hwy Intersection	N/A	130 (intersection width)	No	Surface Stripping, Patching, transverse, longitudinal cracking	7.5	2" - Wear (3+ Lifts of Material) Poor - Raveling	8.5" - Sand trace gravel, brown	f-m Sand, Brown
3	Jefferson Hwy South Bound	2	22	Yes	Surface stripping, Longitudinal, transverse cracking	6.5	1.75" - Wear (3+ Lifts of Material) Fair - Some base layer raveling	10" - Sand trace gravel, brown	f-m Sand, Brown
4	Jefferson Hwy South Bound	2	22	Yes	Surface stripping, Longitudinal cracking	6	1.75" - Wear (3+ Lifts of Material) Fair - Some base layer raveling	12" - Sand trace gravel, brown	f-m Sand, Brown
5	Jefferson Hwy South Bound	2	22	Yes	Surface stripping, patching, transverse cracking	6	1.75" - Wear (3+ Lifts of Material) Good Condition	12+" - Sand trace gravel, brown	Did not reach apparent change in material
6	Jefferson Hwy South Bound	2	35	Yes	Surface stripping, patching, transverse cracking	6.5	1.5" - Wear (3+ Lifts of Material) Fair - Some base layer raveling	12+" - Sand trace gravel, brown	Did not reach apparent change in material
7	Jefferson Hwy South Bound	2	40	Yes	Surface stripping, Longitudinal, transverse cracking	6	1.5" - Wear (3+ Lifts of Material) Fair - Some base layer raveling	12+" - Sand trace gravel, brown	Did not reach apparent change in material
8	Jefferson Hwy North Bound	2	22	Yes	Surface stripping, Transverse, Longitudinal cracking	6.25	1.5" - Wear (3+ Lifts of Material) Fair - Some base layer raveling	12+" - Sand trace gravel, brown	Did not reach apparent change in material
9	Jefferson Hwy North Bound	3	36	Yes	Surface stripping, Transverse, Longitudinal cracking	6.75	2.25" - Wear (3+ Lifts of Material) Fair - Some base layer raveling	13+" - Sand trace gravel, brown	Did not reach apparent change in material
10	Jefferson Hwy North Bound	2	22	Yes	Surface stripping, Transverse cracking	7.25	2.25" - Wear (3+ Lifts of Material) Fair - Some base layer raveling	12+" - Sand trace gravel, brown	Did not reach apparent change in material
11	Jefferson Hwy North Bound	2	22	Yes	Surface stripping, Longitudinal cracking	6.5	1.5" - Wear (3+ Lifts of Material) Fair - Some base layer raveling	12+" - Sand trace gravel, brown	Did not reach apparent change in material
12	Jefferson Hwy North Bound	2	22	Yes	Surface stripping, Some transverse cracking	6.5	1.25" - Wear (3+ Lifts of Material) Fair - Some base layer raveling	12+" - Sand trace gravel, brown	Did not reach apparent change in material

## Core 1

### Street Photos



### Core Photos



Location	Number of Lanes	Roadway Width (ft)	Curb and Gutter	Surface Distresses
Elm Creek Parkway West Bound	4	58	Yes	Surface stripping, Transverse Cracking, Some longitudinal cracking

Bituminous Depth (in)	Lift Thickness and Condition	Base Depth and Description	Subbase or Subgrade Description
9	2.25" - Wear (3+ Lifts of Material) Poor - Raveling	6" - Sand trace gravel, brown	f-m Sand, Brown

## Core 2

### Street Photos



### Core Photos



Location	Number of Lanes	Roadway Width (ft)	Curb and Gutter	Surface Distresses
Elm Creek Parkway & Jefferson Hwy	N/A	130 (intersection width)	No	Surface Stripping, Patching, transverse, longitudinal cracking

Bituminous Depth (in)	Lift Thickness and Condition	Base Depth and Description	Subbase or Subgrade Description
7.5	2" - Wear (3+ Lifts of Material) Poor - Raveling	8.5" - Sand trace gravel, brown	f-m Sand, Brown

## Core 3

### Street Photos



### Core Photos



Location	Number of Lanes	Roadway Width (ft)	Curb and Gutter	Surface Distresses
Jefferson Hwy South Bound	2	22	Yes	Surface stripping, Longitudinal, transverse cracking

Bituminous Depth (in)	Lift Thickness and Condition	Base Depth and Description	Subbase or Subgrade Description
6.5	1.75" - Wear (3+ Lifts of Material) Fair - Some base layer raveling	10" - Sand trace gravel, brown	f-m Sand, Brown

## Core 4

### Street Photos



### Core Photos



Location	Number of Lanes	Roadway Width (ft)	Curb and Gutter	Surface Distresses
Jefferson Hwy South Bound	2	22	Yes	Surface stripping, Longitudinal cracking

Bituminous Depth (in)	Lift Thickness and Condition	Base Depth and Description	Subbase or Subgrade Description
6	1.75" - Wear (3+ Lifts of Material) Fair - Some base layer raveling	12" - Sand trace gravel, brown	f-m Sand, Brown

## Core 5

### Street Photos



### Core Photos



Location	Number of Lanes	Roadway Width (ft)	Curb and Gutter	Surface Distresses
Jefferson Hwy South Bound	2	22	Yes	Surface stripping, patching, transverse cracking

Bituminous Depth (in)	Lift Thickness and Condition	Base Depth and Description	Subbase or Subgrade Description
6	1.75" - Wear (3+ Lifts of Material) Good Condition	12+" - Sand trace gravel, brown	Did not reach apparent change in material

## Core 6

### Street Photos



### Core Photos



Location	Number of Lanes	Roadway Width (ft)	Curb and Gutter	Surface Distresses
Jefferson Hwy South Bound	2	35	Yes	Surface stripping, patching, transverse cracking

Bituminous Depth (in)	Lift Thickness and Condition	Base Depth and Description	Subbase or Subgrade Description
6.5	1.5" - Wear (3+ Lifts of Material) Fair - Some base layer raveling	12+ - Sand trace gravel, brown	Did not reach apparent change in material

## Core 7

### Street Photos



### Core Photos



Location	Number of Lanes	Roadway Width (ft)	Curb and Gutter	Surface Distresses
Jefferson Hwy South Bound	2	40	Yes	Surface stripping, Longitudinal, transverse cracking

Bituminous Depth (in)	Lift Thickness and Condition	Base Depth and Description	Subbase or Subgrade Description
6	1.5" - Wear (3+ Lifts of Material) Fair - Some base layer raveling	12+ - Sand trace gravel, brown	Did not reach apparent change in material

## Core 8

### Street Photos



### Core Photos



Location	Number of Lanes	Roadway Width (ft)	Curb and Gutter	Surface Distresses
Jefferson Hwy North Bound	2	22	Yes	Surface stripping, Transverse, Longitudinal cracking

Bituminous Depth (in)	Lift Thickness and Condition	Base Depth and Description	Subbase or Subgrade Description
6.25	1.5" - Wear (3+ Lifts of Material) Fair - Some base layer raveling	12+ - Sand trace gravel, brown	Did not reach apparent change in material

## Core 9

### Street Photos



### Core Photos



Location	Number of Lanes	Roadway Width (ft)	Curb and Gutter	Surface Distresses
Jefferson Hwy North Bound	3	36	Yes	Surface stripping, Transverse, Longitudinal cracking

Bituminous Depth (in)	Lift Thickness and Condition	Base Depth and Description	Subbase or Subgrade Description
6.75	2.25" - Wear (3+ Lifts of Material) Fair - Some base layer raveling	13+ - Sand trace gravel, brown	Did not reach apparent change in material

## Core 10

### Street Photos



### Core Photos



Location	Number of Lanes	Roadway Width (ft)	Curb and Gutter	Surface Distresses
Jefferson Hwy North Bound	2	22	Yes	Surface stripping, Transverse cracking

Bituminous Depth (in)	Lift Thickness and Condition	Base Depth and Description	Subbase or Subgrade Description
7.25	2.25" - Wear (3+ Lifts of Material Fair - Some base layer raveling	12+ - Sand trace gravel, brown	Did not reach apparent change in material

## Core 11

### Street Photos



### Core Photos



Location	Number of Lanes	Roadway Width (ft)	Curb and Gutter	Surface Distresses
Jefferson Hwy North Bound	2	22	Yes	Surface stripping, Longitudinal cracking

Bituminous Depth (in)	Lift Thickness and Condition	Base Depth and Description	Subbase or Subgrade Description
6.5	1.5" - Wear (3+ Lifts of Material) Fair - Some base layer raveling	12+ - Sand trace gravel, brown	Did not reach apparent change in material

## Core 12

### Street Photos



### Core Photos



Location	Number of Lanes	Roadway Width (ft)	Curb and Gutter	Surface Distresses
Jefferson Hwy North Bound	2	22	Yes	Surface stripping, Some transverse cracking

Bituminous Depth (in)	Lift Thickness and Condition	Base Depth and Description	Subbase or Subgrade Description
6.5	1.25" - Wear (3+ Lifts of Material) Fair - Some base layer raveling	12+ - Sand trace gravel, brown	Did not reach apparent change in material



## Appendix E

### Proposed Signal Improvements Memo

#### Feasibility Report

Jefferson Highway, Elm Creek Parkway, and Signals Project  
City of Champlin Project No. 22501  
SAP. 193-109-011 & SAP 193-114-006  
WSB Project No. 026107-000

Appendix

## Memorandum

To: Heather Nelson, PE, City Engineer

From: Erik Seiberlich, WSB

CC: Jennifer Edison, PE, WSB

Date: October 11, 2024

Re: Jefferson Highway, Elm Creek Parkway, and Signals Project  
 Proposed Signal Improvements Report  
 City Project No. 22501  
 WSB Project No. 026107-000

### Operations Analysis

Turning movement counts were collected for each of the intersections on August 7, 2024. Figure 1 shows the Elm Creek Parkway peak hour turning movement volumes and Figure 2 shows the White Oaks Trail peak hour turning movement volumes.

**F1. Jefferson Highway & Elm Creek Parkway – Existing A.M. and P.M. Peak Hour Volumes**



## F2. Jefferson Highway & White Oaks Trail – Existing A.M. and P.M. Peak Hour Volumes



Traffic operations analysis was performed using a Synchro model. For the intersection of Jefferson Highway and Elm Creek Parkway, modifications to the geometry included changing the southbound approach from dual left turn lanes and a shared through/right turn lane to single left run, through and right turn lanes. Flashing yellow arrow (FYA) left turn phasing was added for all approaches at both intersections. Signal timing for the models was set to 90 and 120 second cycles with optimized phasing.

The inputs for the scenarios included the following:

- Elm Creek Parkway Intersection
  - existing a.m. peak hour traffic volumes and proposed geometry with FYA signal phasing
  - existing p.m. peak hour traffic volumes and proposed geometry with FYA signal phasing
  - a.m. peak hour traffic volumes increased by 25% and proposed geometry with FYA signal phasing
  - p.m. peak hour traffic volumes increased by 25% and proposed geometry with FYA signal phasing
- White Oaks Trail Intersection
  - existing a.m. peak hour traffic volumes and in place geometry with FYA signal phasing
  - existing p.m. peak hour traffic volumes and in place geometry with FYA signal phasing
  - a.m. peak hour traffic volumes increased by 25% and in place geometry with FYA signal phasing
  - p.m. peak hour traffic volumes increased by 25% and in place geometry with FYA signal phasing

The analysis results, shown in Tables 1 and 2 for Elm Creek Parkway, and Tables 3 and 4 for White Oaks Trail, indicate that both intersections are expected to operate acceptably with the modified geometry and FYA phasing. 95<sup>th</sup> percentile queue lengths are shown for movements of concern at the Elm Creek Parkway intersection. The northbound dual left turn bays provide about 275 feet of storage each. The westbound dual left turn bays provide about 200 feet of storage

each and the through movement has about 300 feet of storage before a queue would extend to the TH 169 intersection. None of the 95<sup>th</sup> percentile queue lengths are shown to extend near or beyond the storage area provided.

#### T1. Jefferson Highway & Elm Creek Parkway – Existing Traffic and Proposed Geometry

Intersection			AM Peak			PM Peak			Intersection Delay*	
Control	Location	Approach	Approach Delay* (LOS) [95% Queue]**			Intersection Delay*	Approach Delay* (LOS) [95% Queue]			Intersection Delay*
			Left	Thru	Right		Left	Thru	Right	
Traffic Signal	Jefferson Highway & Elm Creek Parkway	NB	<10 (A)	17 (B)	<10 (A)	18 (B)	38 (D) [111]	19 (B)	<10 (A)	27 (C)
		WB	36 (D)	29 (C)	<10 (A)		39 (D) [55]	31 (C) [82]	<10 (A)	
		SB	<10 (A)	16 (B)	<10 (A)		42 (D)	21 (B)	<10 (A)	
		EB	38 (D)	24 (C)			40 (D)	25 (C)		

\* Delay measured in seconds per vehicle

\*\* Queue is measured in feet.

#### T2. Jefferson Highway & Elm Creek Parkway – 25% Increase in Traffic and Proposed Geometry

Intersection			AM Peak			PM Peak			Intersection Delay*	
Control	Location	Approach	Approach Delay* (LOS) [95% Queue]**			Intersection Delay*	Approach Delay* (LOS) [95% Queue]			Intersection Delay*
			Left	Thru	Right		Left	Thru	Right	
Traffic Signal	Jefferson Highway & Elm Creek Parkway	NB	10 (B)	18 (B)	<10 (A)	19 (B)	40 (D) [138]	20 (B)	<10 (A)	29 (C)
		WB	38 (D)	29 (C)	<10 (A)		42 (D) [69]	31 (C) [99]	<10 (A)	
		SB	11 (B)	17 (B)	<10 (A)		44 (D)	22 (C)	<10 (A)	
		EB	39 (D)	24 (C)			43 (D)	27 (C)		

\* Delay measured in seconds per vehicle

\*\* Queue is measured in feet.

#### T3. Jefferson Highway & White Oaks Trail – Existing Traffic and Proposed Geometry

Intersection			AM Peak			PM Peak			Intersection Delay*			
Control	Location	Approach	Approach Delay* (LOS) [95% Queue]**			Intersection Delay*	Approach Delay* (LOS) [95% Queue]			Intersection Delay*		
			Left	Thru	Right		Left	Thru	Right			
Traffic Signal	Jefferson Highway & White Oaks Trail	NB	19 (B)	11 (B)	<10 (A)	10 (B)	21 (C)	12 (B)	<10 (A)	12 (B)		
		WB	17 (B)	<10 (A)			18 (B)	<10 (A)				
		SB	19 (B)	<10 (A)			21 (C)	<10 (A)				
		EB	18 (B)	<10 (A)			20 (B)	<10 (A)				

\* Delay measured in seconds per vehicle

\*\* Queue is measured in feet.

**T4. Jefferson Highway & White Oaks Trail – 25% Increase in Traffic and Proposed Geometry**

Intersection			AM Peak			PM Peak						
Control	Location	Approach	Approach Delay* (LOS) [95% Queue]**			Intersection Delay*	Approach Delay* (LOS) [95% Queue]					
			Left	Thru	Right		Left	Thru				
Traffic Signal	Jefferson Highway & White Oaks Trail	NB	20 (B)	12 (B)	<10 (A)	10 (B)	23 (C)	13 (B)	<10 (A)	13 (B)		
		WB	17 (B)	<10 (A)			20 (B)	<10 (A)				
		SB	19 (B)	<10 (A)			23 (C)	<10 (A)				
		EB	18 (B)	<10 (A)			22 (B)	<10 (A)				

\* Delay measured in seconds per vehicle

\*\* Queue is measured in feet.

**Infrastructure Improvements**

A field evaluation of the traffic signal infrastructure was performed in October 2024. The purpose of the evaluation was to identify what modifications would be necessary to upgrade the signal to provide flashing yellow arrow (FYA) signal indications for all approaches, and to accommodate the proposed change in geometry for the southbound approach at the Elm Creek Parkway intersection. The necessary modifications at each of the intersections include:

- New TS2 traffic signal cabinet (can utilize in-place foundation)
- New Econolite controllers
- Eight FYA (4-indication signal heads) – two for each approach
- Four R10-12a mast arm signs
- Labor (involves installation of all components, and disconnecting/reconnecting conductors)
- Traffic control

The estimated cost for the improvements at each intersection is \$55,000 - \$65,000 (\$110,000 to \$130,000 total).

I am available at your earliest convenience to discuss this report. If you have any questions, please do not hesitate to call me at 612.508.5996.