November 1, 2021

Honorable Mayor and Members of the City Council
City of Woodbury
8301 Valley Creek Road
Woodbury, MN 55125

Dear Mayor and Council Members:

Pursuant to your request, Short Elliott Hendrickson Inc. (SEH®) is submitting this engineer’s Feasibility Report for the Lake Road and Pioneer Drive Intersection Improvements Project.

The purpose of the project is to improve safety at the intersection of Lake Road and Pioneer Drive while providing needed capacity improvement to address increased vehicle traffic to allow traffic to operate at an acceptable level of service and providing enhanced pedestrian and school crossings to meet community needs. The proposed improvement to this intersection includes a single lane roundabout which will reduce travel speeds through the intersection, improve motor vehicle safety, and improve pedestrian crossing safety. The intersection improvements will integrate with the 4 to 3 lane conversion projects proposed in 2022 for Lake Road west of the intersection to Woodlane Drive and east of the intersection to Manning Avenue (TH 95) in 2023.

Construction of the intersection improvements is scheduled to start and be completed during the summer of 2022.

This report includes a narrative describing the proposed improvements, estimated project costs, proposed financing, and drawings showing the project work.

Thank you for the opportunity to work with you on this important project. I am available to answer any questions you may have.

Sincerely,

Chad E. Setterholm, PE
Project Manager

x:\uz\w\woodb\158152\4-prelim-dsgn-rpts\43-prelim-dsgn\feasibility report\lake rd & pioneer dr intersection improvements feasibility report.docx
Feasibility Report

Lake Road and Pioneer Drive Intersection Improvements Project
City of Woodbury, Minnesota

City Project No. 16-2020-011
SEH No. WOODB 15815258152

November 1, 2021

I hereby certify that this 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.

Chad E. Setterholm, PE
Date: November 1, 2021 License No.: 40913

Reviewed By: Zachary Stafslien
Date: November 1, 2021

Zachary Stafslien

Short Elliott Hendrickson Inc.
3535 Vadnais Center Drive
St. Paul, MN 55110-5196
651.490.2000
Contents

Letter of Transmittal
Certification Page
Contents

1 Introduction ................................................................................. 1
  1.1 Authorization......................................................................... 1
  1.2 Background Information ..................................................... 1
    1.2.1 Roundabout Benefits ....................................................... 1
    1.2.2 Traffic Signal Benefits ..................................................... 2

2 Existing Conditions and Proposed Improvements ...... 2
  2.1 Project Location ................................................................. 2
  2.2 Existing Conditions .......................................................... 3
  2.3 Intersection Improvements .............................................. 3
  2.4 City and Private Utilities ................................................... 3
  2.5 Storm Water Regulatory Requirements .......................... 4

3 Assessments ................................................................................. 4

4 Estimated Costs ............................................................................ 5

5 Proposed Project Financing .................................................... 5
  5.1 Lake Road and Pioneer Drive Intersection Improvements ..... 5

6 Construction Timeline and Construction Staging ...... 5
  6.1 Project Schedule .................................................................. 5

7 Summary and Recommendations ................................. 6

8 Standard of Care ........................................................................... 6

List of Figures
Figure 1 – 2  Lake Road and Pioneer Drive Intersection Improvements

List of Appendices
Opinion of Probable Cost
Assessment Role
1 Introduction

1.1 Authorization

The Feasibility Report for the Lake Road and Pioneer Drive Intersection Improvements Project was authorized by the City Council on December 9, 2020 to determine the feasibility of improving the intersection from its current four way stop condition with a single lane roundabout.

As part of the preparation of the feasibility report, the following information has been gathered, including the following:

- Topographical surveys
- Preliminary Gopher State One Call utility locates
- Soil borings
- Vehicle traffic counts

1.2 Background Information

Lake Road and Pioneer Drive are both local State Aid roadways and classified as A-minor expander and collector roadways within the City of Woodbury. Based on a 2016 traffic study performed by SEH, the intersection has been identified to be improved for capacity improvements to allow future traffic volumes continued operation at acceptable levels of service. A traffic signal and roundabout control have been considered and evaluated.

1.2.1 Roundabout Benefits

Studies have shown roundabouts are safer than traditional signal-controlled intersections for both vehicular and pedestrian traffic. With a reduced number of vehicle-to-vehicle and vehicle-to-pedestrian conflict zones as compared to a signalized intersection; studies have shown single lane roundabouts reduce vehicular crashes by 35% with up to 60% less severe injuries along with reductions of over 60% for pedestrian and 15% for bicycle crashes. (Source: National Cooperative Highway Research Program; MnDOT “A Study of the Traffic Safety at Roundabouts in Minnesota.”)

Safety provided by a single lane roundabout is achieved by simplifying the traffic flow to a single direction which improves decision making by drivers (no chasing yellow or running red lights), pedestrians, and bicyclists. Roundabouts also control speed of all traffic navigating the intersection by impeding free flow traffic to slow vehicles to a designed speed of approximately 15 mph while creating a traffic calming effect to promote slower speeds through corridors such as school zones as compared to a traffic signal. Extended medians provide center median refuge for pedestrians and the opportunity to cross one lane of traffic at a time.
Roundabouts improve traffic flow through intersections promoting less congestion and reduced time vehicles need to wait at the intersection during off-peak traffic hours versus a signal-controlled intersection.

1.2.2 Traffic Signal Benefits

Signal-controlled intersections promote free-flow traffic speeds for vehicular traffic allowing the intersection to operate more efficiently than a single lane roundabout during peak traffic hours and allowing more vehicles through the intersection. While the free-flow nature of a signalized intersection allows increased efficiency during peak traffic hours, speeds through the intersection can vary from low to high increasing the severity of vehicular, pedestrian, and bicyclist collisions.

Signal-controlled intersections also provide clear right of way to pedestrians during red lights along with enhanced pedestrian features such as countdown timers and leading pedestrian intervals programed into the traffic signal phasing.

1.3 Public Engagement

City Engineering staff and SEH worked collaboratively through a public engagement process which included informational mailers, two virtual public comment periods, and virtual presentation. In addition, informational and educational background, exhibits, intersection simulations, public survey results, and resource links were shared on the City of Woodbury’s website. City staff conducted meetings with South Washington County School District staff in July 2020 and March 2021 to discuss the improvement, review concerns, and formulate design options and refinements. City staff held a virtual open house in September 2020 where more than 270 responses were collected from a variety of different users including biking, commuting, and walking, on the pros and cons of a signal versus a roundabout. A second virtual open house was conducted in March of 2021 where the roundabout option was presented as the city staff recommended option to gather additional feedback from the residents. Responses collected during the public engagement process indicated nearly equal support for either a single lane roundabout or traffic signal as improvements for the intersection.

Common themes from the public engagement process include the following:

- A desire for slower vehicular speeds
- Pedestrian safety improvements
- Clear signage and sight lines for pedestrian and vehicles
- Limiting traffic delays
- Improved pedestrian safety at school crossings.

City Staff presented the proposed single lane roundabout improvements at a Council workshop on July 21, 2021.

2 Existing Conditions and Proposed Improvements

2.1 Project Location

The project is located at the intersection of Lake Road and Pioneer Drive adjacent to both Lake Middle School and Middleton Elementary School. The project is scheduled for construction during
the summer of 2022 coinciding with the summer break for Lake Middle and Middleton Elementary schools.

2.2 Existing Conditions

Lake Road and Pioneer Drive respectively operate as an east-west roadway north-south roadways primarily serving commuting vehicular traffic from surrounding residential neighborhoods, the Lake Middle and Middleton Elementary schools, and the Woodbury Community Church.

Pavement for both roadways within the project limits are showing distresses in the existing surfaces consistent with conditions warranting full pavement replacement. Pedestrian ramps exist at all four quadrants of the intersection and work in conjunction with existing multi-use bituminous trails along both sides of Lake Road and Pioneer Drive.

2.3 Intersection Improvements

A single lane roundabout has been identified to be constructed at the intersection of Lake Road and Pioneer Drive to improve for capacity for projected traffic volume growth along these roadways and to serve the pedestrian and bicycle needs of the community. Based on public feedback and engineering recommendation a single lane roundabout addresses concerns residents posed during the public engagement process. The geometric design of the proposed roundabout has been maximized to reduce vehicle speeds entering the intersection by tightening the radii and increasing the sight lines. Reducing the vehicle speed will reduce the chance of severe injuries for all transportation modes, especially pedestrians. Pedestrians will only need to navigate one direction of traffic at a time and refuge islands shorten the crossing distances for pedestrians. High visibility crosswalks are proposed to increase driver awareness of pedestrians. Rapid flashing beacons are proposed at identified school crossings to increase safety and increase awareness of drivers. School zone speed limits and dynamic speed signs are proposed to help reduce driver speed before the intersection. Improvements associated with the proposed single lane roundabout include:

- **Associated Roundabout Improvements**
  - Street lighting.
  - Pedestrian ramps.
  - Bituminous trails located along the boulevards.
  - Rectangular Rapid Flashing Beacons at identified school walking routes.
  - Signed pedestrian crossings at Blue Ridge Drive and Juniper Lane.
  - Signage and pavement marking upgrades.
  - Signage to identify the existing school speed zone along Lake Road.
  - Storm sewer improvements for drainage.
  - Stormwater BMP’s.
  - Surmountable center truck apron to allow occasional truck movements to navigate the roundabout.

2.4 City and Private Utilities

City owned sanitary sewer, water main, and storm sewer exist within the project limits. Other than minor adjustments to water main appurtenances such as valve boxes and sanitary manhole
casting adjustments, no other work is planned for the sanitary sewer and water main utilities.
New lateral storm sewer and catch basins will be installed and configured to provide drainage for
the roundabout improvements. The later storm sewer improvements will connect to the existing
trunk storm sewer that runs southerly along Pioneer Drive to an existing storm water pond
constructed with the previous improvements to Pioneer Drive in 1994.

There is potential for coordination for water treatment piping with the State of Minnesota’s
Conceptual Drinking Water Supply Plan. All costs associated with the added water main work
would be paid through the available State funds.

Private utilities exist within the project limits and may require minor relocation to accommodate
the proposed roundabout. Private utility coordination meetings will be held to inform owners of
the private utilities of needed cooperation for their facilities to accommodate the proposed
improvements.

2.5 Storm Water Regulatory Requirements

The improvements fall within the South Washington Watershed District (SWWD) boundary.
Grading impacts associated with the project will exceed 1-acre requiring a NPDES permit and
Watershed approval/permit. New additional impervious surfaces associated with the project will
be less than 6000 square feet which is below the threshold for addressing stormwater runoff
volumes and allow stormwater BMP’s to be implemented to address water quality in the form of
bioretention.

3 Assessments

City practices and policies will be followed to arrive at estimated assessments for this project. All
properties adjacent and benefit from the improvements are proposed to be assessed. There are
three parcels adjacent to the project as identified in Figure 2 of the Appendix. Assessments are
calculated based on City Policy CD-ENGPW-4.2 Roadway Construction and Rehabilitation
Financing Policy. The assessments percent cost is based on the land use type for each property
for Minor Arterial/Collector Roadways within the MUSA. The frontage length for each property is
calculated based on the parcel length along the project on Lake Road and Pioneer Drive. The
cost of the project is divided by the total roadway length on the project obtaining a cost per lineal
foot. The cost per lineal foot is divided by two for half the roadway and then is multiplied by the
frontage length of each property obtaining the assessment cost.

Cost Per Linear Foot  ($3,377,475.91/(3708 lf*2))=$455.43/lf

- 2893 Pioneer Dr  ($455.43/lf x 60 lf x 90%) = $24,593
- 2875 Pioneer Dr  ($455.43/lf x 1047.51 lf x 75%) = $357,801
- 2893 Pioneer Dr  ($455.43/lf x 2046.41 lf x 75%) = $698,999

The total estimated assessments for the intersection improvements are $1,081,393. See the
attached worksheet to see full assessment calculations.
4 Estimated Costs

The costs quoted herein are estimates only. The actual cost of the work would be determined through the public bidding process and a reconciliation of all project related costs. A detailed cost estimate has been included in Appendix A. The figures include budget amounts for construction cost and project related costs, such as administrative, engineering, surveying, easement and r/w acquisition and testing. The estimated project costs are summarized below:

Total Estimated Project Cost for the Lake Road and Pioneer Drive Intersection Improvements is $3,387,476.

The above cost estimates do not include cost associated with storm water regulatory requirements or mitigation of unknown contaminated soils if encountered.

5 Proposed Project Financing

5.1 Lake Road and Pioneer Drive Intersection Improvements

The project will be funded through the City’s Major Roadway Special Assessment Fund – Phase 1, Central District Trunk Storm Sewer Water Fund, Municipal State Aid Roadway Construction Fund and special assessments to benefitting properties.

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<td><strong>Total</strong></td>
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6 Construction Timeline and Construction Staging

The project is proposed to be constructed starting in the summer of 2022. A tentative project schedule is included below.

6.1 Project Schedule

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<td>November 10, 2021</td>
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<td>Task</td>
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7 Summary and Recommendations

From the results of the feasibility study and preliminary investigations, it can be concluded that:

- The project is technically feasible as it relates to general engineering principles, practices and construction procedures as it has been presented in this report.
- The project is necessary to improve safety along the corridor, update signalized intersections, and improve deteriorating pavement.
- The project is cost-effective when all related costs are considered.

We recommend the following:

- City Council accept this feasibility report and consider ordering the improvements for the Lake Road and Pioneer Drive Intersection Improvements.

8 Standard of Care

The conclusions and recommendations contained in this report were arrived at in accordance with generally accepted professional engineering practice at this time and location. No warranty is implied or intended.
Figures

Figure 1 – 2  Lake Road and Pioneer Drive Intersection Improvements
LAKE ROAD AND PIONEER DRIVE INTERSECTION IMPROVEMENTS

FILE NO.: 198792
DATE: 10/8/21

LEGEND
- SIGN
- SIGN AND DYNAMIC SPEED DISPLAY SIGN (DSDB)
- RECTANGULAR RAPID FLASHING BEACON (RFFB)

FIG. 1

LAKE ROAD
PIONEER DRIVE
WOODBURY LAKE MIDDLE SCHOOL
WOODBURY COMMUNITY BENCH
BLUE RIDGE DRIVE
SAVANNAH OAKS PASS
JUNIPER LANE
TORREY DRIVE
MAGNOLIA DRIVE

PLACE APPX. 550' EAST OF WIMBELDON DR.
PLACE APPX. 550' EAST OF BLUE RIDGE DR.
PLACE APPX. 550' EAST OF WIMBELDON DR.

DATE: 10/8/21
Appendix A

Opinion of Probable Cost

Assessment Role
## WOODBURY, MINNESOTA
### LAKE ROAD AND PIONEER DRIVE INTERSECTION IMPROVEMENTS
#### SEH NO. LAKMO 158152

10/26/21

### OPINION OF PROBABLE COST

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**SUBTOTAL ESTIMATED CONSTRUCTION COST** $2,417,664

+ 10% CONTINGENCIES $241,766

**TOTAL ESTIMATED CONSTRUCTION COST** $2,659,430

+27% INDIRECT $718,046

**R/W Acquisition** $10,000

**TOTAL ESTIMATED PROJECT COST** $3,387,476
### ASSESSMENT SUMMARY
WOODBURY, MINNESOTA
LAKE ROAD AND PIONEER DRIVE INTERSECTION IMPROVEMENTS
SEH NO. WOODB 158152

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<thead>
<tr>
<th>Total Project Cost of Roadway Improvements (1)</th>
<th>$3,377,475.91</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LAKE ROAD</strong></td>
<td><strong>PIONEER DRIVE</strong></td>
</tr>
<tr>
<td>Total Length of Roadway Rehabilitation Improvements (lf)</td>
<td>3708</td>
</tr>
<tr>
<td>Roadway Cost per Lineal Foot</td>
<td>$910.86</td>
</tr>
<tr>
<td>Frontage Cost per Lineal Foot (2)</td>
<td>$455.43</td>
</tr>
</tbody>
</table>

**Assessed Property**

<table>
<thead>
<tr>
<th>PID</th>
<th>Address</th>
<th>Owner</th>
<th>Frontage (lf)</th>
<th>% Cost (3)</th>
<th>Assessment Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.028.21.44.0003</td>
<td>2893 Pioneer Dr</td>
<td>US West Communications</td>
<td>60</td>
<td>90%</td>
<td>$24,593</td>
</tr>
<tr>
<td>16.028.21.44.0093</td>
<td>2975 Pioneer Dr</td>
<td>Woodbury Community Church</td>
<td>1047.51</td>
<td>75%</td>
<td>$357,801</td>
</tr>
<tr>
<td>21.028.21.11.0001</td>
<td>3133 Pioneer Dr</td>
<td>Ind School District #833</td>
<td>2046.41</td>
<td>75%</td>
<td>$698,999</td>
</tr>
</tbody>
</table>

Total Assessment Charge: $1,081,393

(1) The project cost used to determine assessments includes the construction, engineering, material testing, surveying, advertising, administrative, legal, easement, fiscal, and any other costs incurred to implement the improvements.

(2) Frontage Cost per Lineal Foot = Roadway Cost per Lineal Foot/2

(3) Percentage of assessable costs base on City of Woodbury’s current assessment policy.
Sustainable buildings, sound infrastructure, safe transportation systems, clean water, renewable energy and a balanced environment. Building a Better World for All of Us communicates a companywide commitment to act in the best interests of our clients and the world around us.

We are confident in our ability to balance these requirements.