Lincoln Parkway Corridor Analysis Final Report

City of Northfield
February 2024

Real People. Real Solutions.

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Certification

Corridor Analysis Report

For

Lincoln Parkway and Dresden Avenue

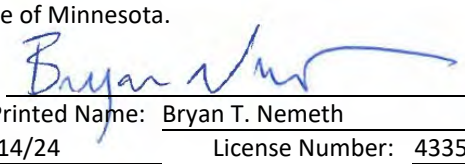
City of Northfield

0T4.129389

February 14, 2024

PROFESSIONAL ENGINEER

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.

Signature: 

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I. Introduction

This report has been prepared to document transportation system analysis that was completed to support the development of a planning-level roadway concept for Lincoln Parkway and Dresden Avenue in Northfield, MN.

The roadway concept developed throughout this process is intended to address the following transportation-related issues in the study area:

- Disorderly pick-up and drop-off operations at Greenvale Park Elementary School
- Lack of dedicated bicycle facilities
- Difficult pedestrian crossings across Lincoln Parkway when school crossing guards are not present
- High vehicle speeds

When developing improvement alternatives and determining the preferred concept, the following was considered:

- Maintaining consistency with other local planning efforts, with specific emphasis on generally matching the vision established in the 2022 *Pedestrian and Bikeway Analyzation Report*
- Accounting for anticipated traffic pattern changes associated with the recent and proposed residential developments, including Kraewood and Cedar Meadows
- Proactively addressing current and potential roadway safety issues, especially in relation to the new Greenvale Park Elementary School operations

Study Goals

Goals of the study include:

- Understanding the effectiveness of 2021 improvements
- Developing future options and recommendations for Lincoln Parkway and Dresden Avenue
- Increasing multimodal connections and safety
- Determining multimodal network improvements for Safe Routes to School

II. Study Area Overview

Adjacent Land Uses

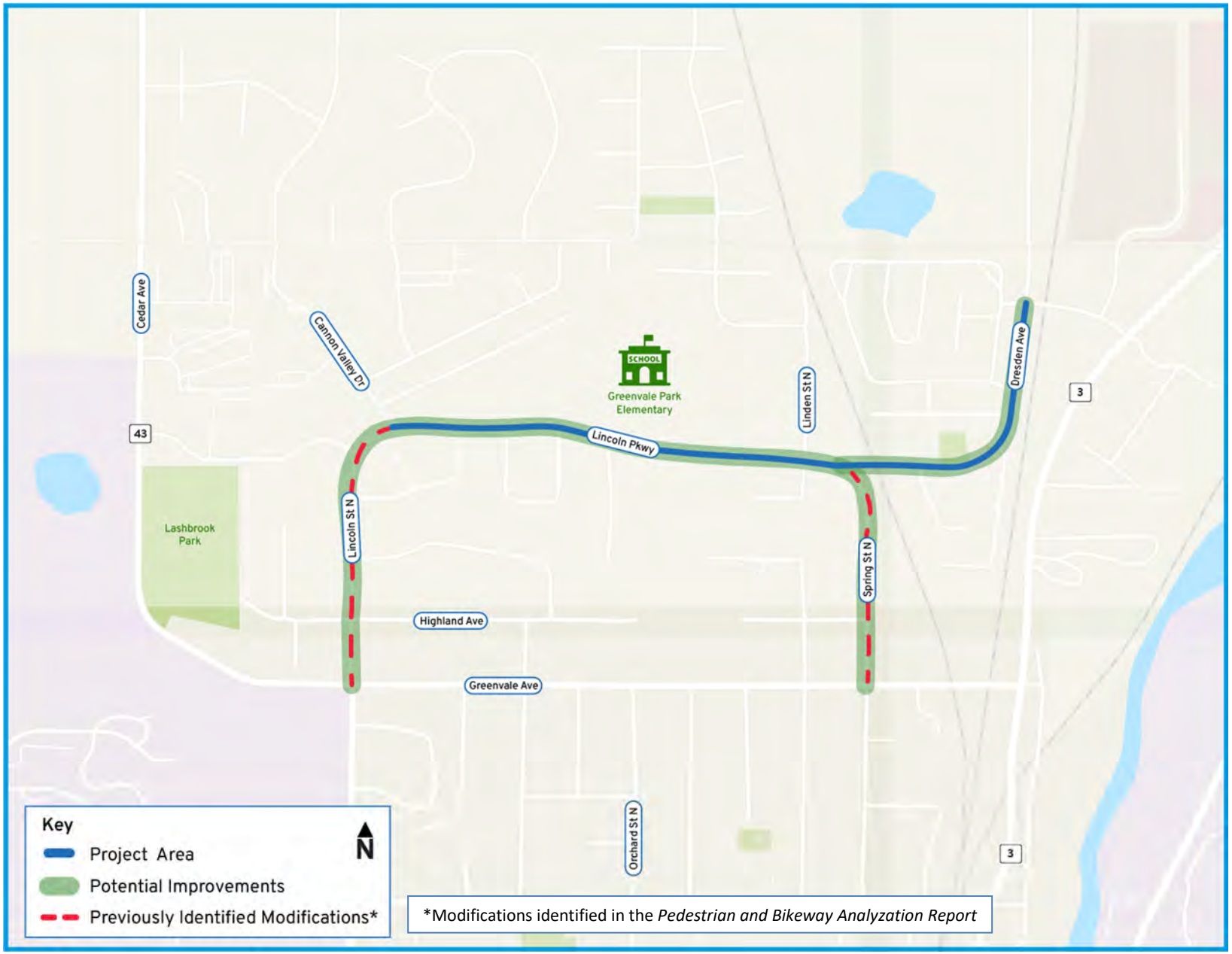
Lincoln Parkway

Land use along Lincoln Parkway is primarily single family residential. Zoned as Neighborhood Residential 1, most of the land on the southern side of the street contains single family homes. The exception is directly south of Greenvale Park Elementary School, on the recently redeveloped Christmas tree lot. This development is multi-family residential and includes a large apartment building and some dense single-family homes further to the south. North of Lincoln Parkway is mostly public/semi-public land. This includes Greenvale Park Elementary School and the Community Center. In addition, this block contains open park space, the Lone Oak Nature Area, and the Greenvale Park Community Garden.

Dresden Avenue

To the east of Lincoln Parkway, along Dresden Avenue, land use is again primarily residential. The south side of the street is entirely residential, and there is a small park, Dresden Hills Park, located on the northern side of the street. North of the park and single-family housing, after the road turns to head north, is the Viking Terrace manufactured home park, a community with over 100 homes.

Figure 1: Study Area



Existing Roadway Configuration

Lincoln Parkway

- Currently a two-lane roadway (one lane in each direction) with wide shoulders
- Side street stop control (no stop signs on Lincoln Parkway) at all intersections between Dresden Avenue and Cannon Valley Drive
- Parking is permitted on both sides of the roadway on most of the corridor
    - Parking is not permitted on the north side of Lincoln Parkway adjacent to Greenvale Park Elementary (indicated by no parking signs), however many people have been observed parking here.
- 30 mph posted speed limit. A school zone is present near Greenvale Park Elementary School, with a 20 mph speed limit when children are present in the school zone.
    - School zone speed limit signs are present, with a dynamic speed display sign present for eastbound traffic as it enters the school zone from the west
- A sidewalk is present on north side of Lincoln Parkway throughout study area. Upon completion of the Kraewood Residential development, a sidewalk will also be present on the south side of Lincoln Parkway between Linden Street and Juniper Avenue (in 2024, the existing gap between Linden Street and Green Meadow Court will be completed)
- Marked north-south pedestrian crossings are currently present at:
    - Juniper Avenue (west approach)
    - Lathrop Drive (east approach)
    - Green Meadows Court (west approach)
    - Linden Street (west approach)
- Crossing guards are present before and after school at the following locations:
    - Lincoln Parkway and Linden Street
    - Lincoln Parkway and Green Meadow Court
    - Greenvale Park Elementary center driveway (where school buses enter and exit)
- No dedicated bicycle facilities

Dresden Avenue

- Currently a two-lane roadway (one lane in each direction) with wide shoulders
- Parking permitted on both sides of Dresden Avenue
- 30 mph posted speed limit
- Stop control on Dresden Avenue at Lincoln Parkway/Spring Street and at Fremouw Avenue. Side street stop control (no control on Dresden Avenue) at other intersections in the study area
- A sidewalk exists on both sides of the corridor between Lincoln Parkway and Viking Terrace, with a sidewalk present on the west side of the corridor between Viking Terrace and Fremouw Avenue
- An at-grade railroad crossing is present on the east approach of the intersection of Dresden Avenue and Lincoln Parkway/Spring Street
    - This is a low train activity crossing, with two trains per day
    - The crossing has two-quadrant gates, which is appropriate for the amount of train activity

Study Area Traffic Volumes

2023 daily traffic information was obtained from the Minnesota Department of Transportation (MnDOT) database:

- **Lincoln Parkway**
  - Near Linden Street: 3,400 vehicles per day
  - Near Cannon Valley Drive: 2,500 vehicles per day
- **Dresden Avenue**
  - Near Lincoln Parkway/Spring Street: 1,400 vehicles per day
- **Linden Street**
  - Near Lincoln Parkway: 1,400 vehicles per day
- **Cannon Valley Drive**
  - Near Lincon Parkway: 2,500 vehicles per day

Peak hour traffic volumes were collected through the Traffic Study for Greenvale Park Elementary School in Northfield, MN, dated November 7, 2022.

Traffic Growth Potential

MnDOT historic traffic data was reviewed to understand traffic growth potential in the study area, with this data showing traffic has been generally consistent over the past 20 years. Historic traffic data for Lincoln Parkway is shown in **Figure 2** and data for other study area roadways is shown in **Figure 3.**

Based on historic traffic data, a modest amount of traffic growth has been assumed when evaluating the future performance of the roadway system (0.5 percent annual traffic growth assumed over the next 20 years).

Figure 2: Historic Traffic Data on Lincoln Parkway

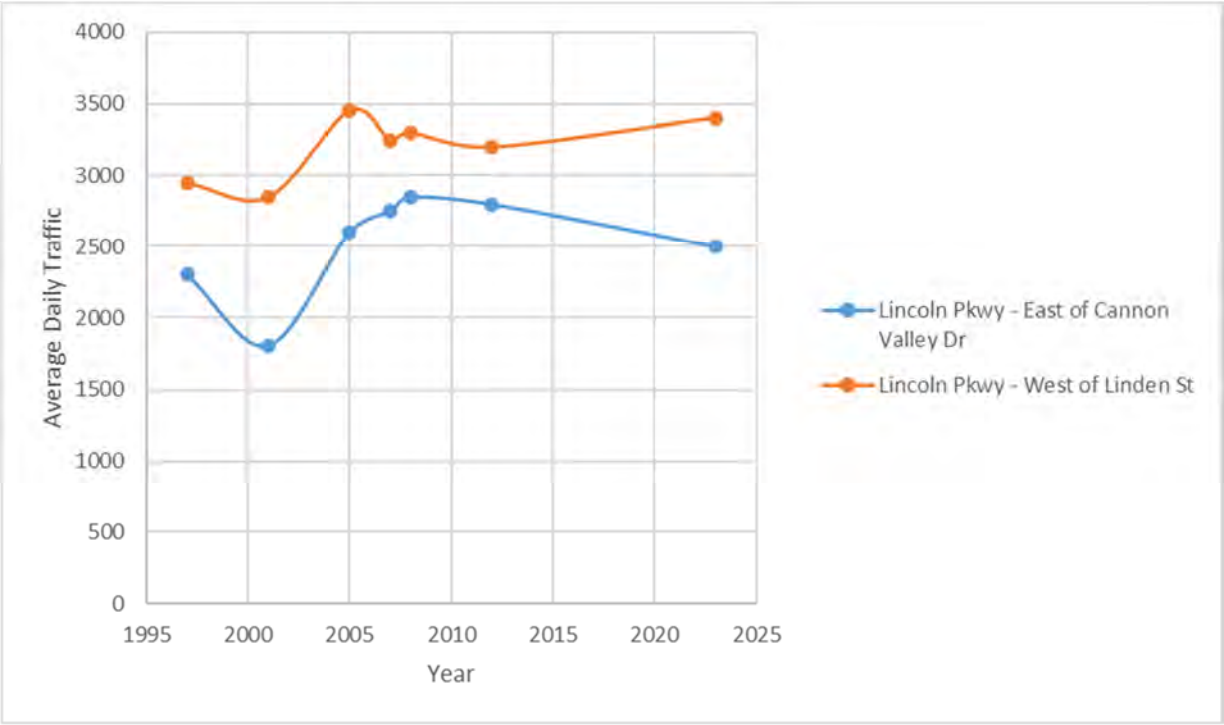
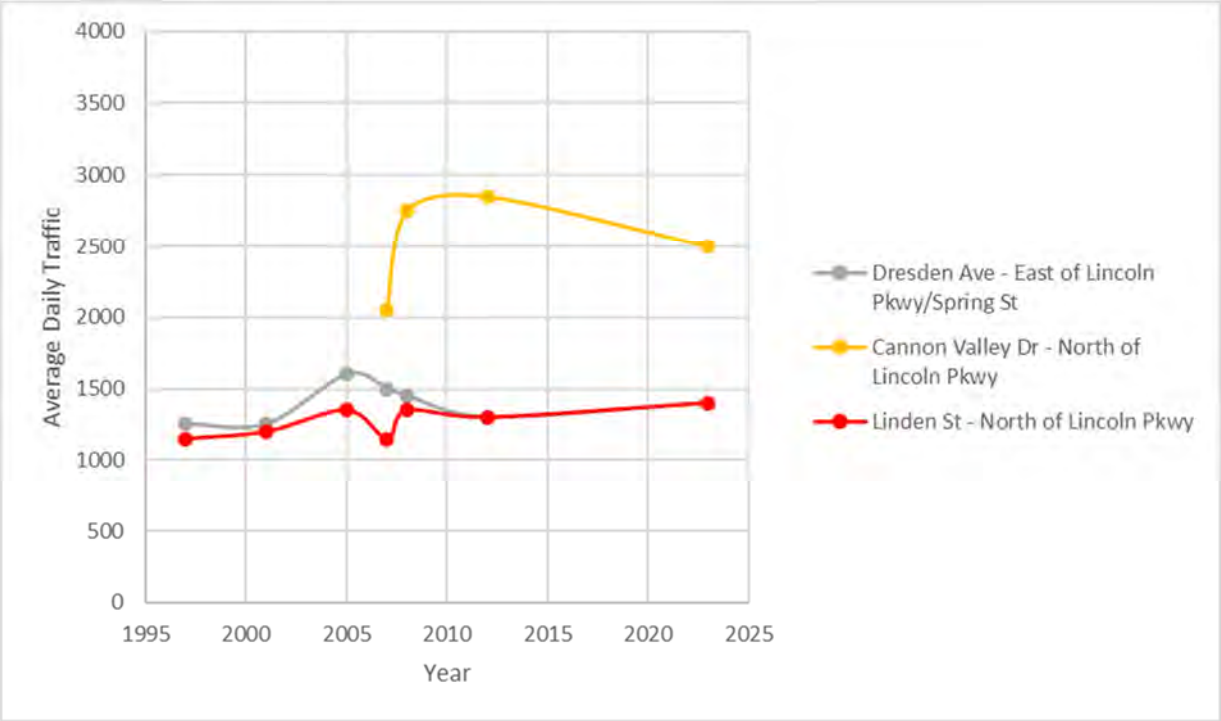


Figure 3: Historic Traffic Data on Other Study Area Roadways



III. Transportation System Performance

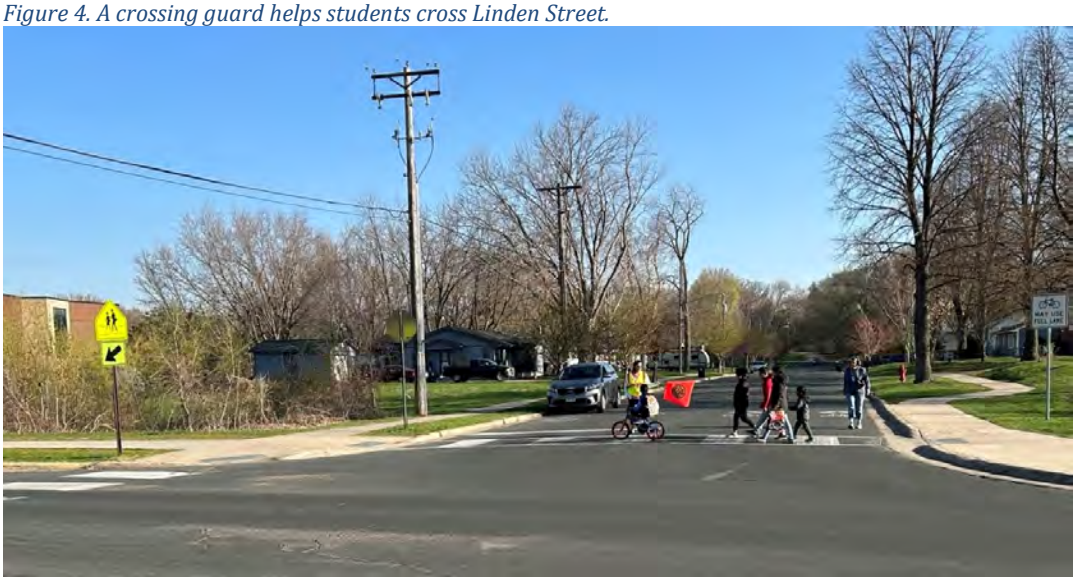
Traffic Flow

A site visit to observe traffic operations at Greenvale Park Elementary school was conducted on May 4th, 2023. Notes and observations about both the morning drop off period and afternoon pick up were taken.

School Dropoff

The school day begins at 8:15 AM, and the first parents begin dropping off their students at around 7:50 AM. Crossing guards are in place at the three busiest crossing locations along Lincoln Parkway: the Linden Street intersection, the Green Meadow Court intersection, and the Greenvale Park Elementary School center driveway where the school buses enter and exit the parking lot.

Figure 4. A crossing guard helps students cross Linden Street.



The directional distribution of vehicles was generally even between east and west. At times, small queues of eastbound traffic formed, but they maxed out at four vehicles and dissipated quickly. There was very little interruption of through traffic operations along Lincoln Parkway caused by these queues.

Figure 5: Cars queue as they wait to turn into the Greenvale Park School Parking Lot

Parents and students walking to school were split in the direction they came from, with approximately 60% coming from the east and 40% coming from the west. Most students coming from the west crossed Lincoln Parkway at Green Meadow Court with the help of the crossing guard stationed at that location. Students crossing here did not disrupt traffic, and any vehicles present were patient and waited for students to cross.

School Pickup

Pick-up operations after school tend to be more disorderly than morning drop-off operations. School dismissal time is at 3:15 PM, and vehicles started arriving at 2:50 PM. The school parking lot has a driveway for vehicles to queue, but many parents chose to park along the north side of Lincoln Parkway. By dismissal time, the interior parking lot queue often spills back to the parking lot entrance.

Figure 6: Vehicles queue for pickup shortly before the school is dismissed.

Figure 7: Vehicles park along Lincoln Parkway waiting for students.

Traffic flow impacts during the school dismissal time period appear to be largely caused by vehicles parking on the north side of Lincoln Parkway prior to school dismissal. This is exacerbated by some drivers utilizing the parking lane as a turn lane as well, causing some confusion for drivers. Some issues also occur in the eastbound direction (due to no left turn lane into the school), with vehicles sometimes attempting to bypass queued left turning vehicles (vehicles waiting to turn left into the school) on the south shoulder.

Figure 8: Disorderly traffic flow along north curb of Lincoln Parkway at the school entrance

Figure 9: Bus bypassing eastbound queued vehicle on the south shoulder

Pedestrian activity is the highest in the afternoon at Linden Street, however most pedestrians were observed walking to the east rather than crossing Lincoln Parkway in the southbound direction at this location. The highest number of pedestrians crossing Lincoln Parkway was observed at Green Meadow Court, causing some slight congestion (queues of around eight vehicles were observed, taking 15 to 30 seconds to clear)

While there are some sporadic impacts to traffic flow during the immediate after-school period, operations are generally good. Within 15 minutes of both the start and the end of the school day, the traffic flow is back to normal on Lincoln Parkway.

It was also observed that bicyclists used the sidewalk to get to and from school and the bike racks were full.

Additionally, the Traffic Study for Greenvale Park Elementary School in Northfield, MN, dated November 7, 2022 provided some additional observations and information:

- Lack of staff parking at the Northfield Community Education Center. Staff regularly park on Lincoln Parkway.
- Two documented crossing guard violations
- During the afternoon pickup period, vehicles regularly back out onto Lincoln Parkway
- School enrollment currently is around 430 students, and the new school can accommodate up to 600 students
- Many parents drop off and pick up students on Lincoln Parkway rather than dropping off and picking up within the site
- 50 plus students are open enrolled that are not within walking distance and bus service is not provided

Community concerns around the school include:

- Vehicles not yielding to pedestrians
- Crossing Lincoln Parkway while walking can be challenging when crossing guards are not present
- Vehicles speeding on Lincoln Parkway
- Difficult to bike as there are no bike accommodations
- Sidewalk on east side of Greenvale can be closed in the winter
- On street parking obscures sight lines for pedestrians

Short-term actions were completed in 2021 to alleviate some of the concerns and were in place prior to the 2023 observations:

- Relocated the dynamic speed display sign from Second Street to Lincoln Parkway
- No parking and yellow curb by crosswalks to identify where vehicles should not be parked
- No parking and yellow curb on the north side of Lincoln Parkway by the Greenvale Park Elementary entrance
- More flagger training for School District Staff
- Deployment of speed counters in the fall to collect speeds
- Northfield Schools is exploring contracted parking in the area to serve staff
- Northfield Schools has interest in coordinated ongoing group walk to school efforts

These actions were deemed of limited success to help the safety and operations near the school but helped, along with the 2023 observations, to identify a need to make the north side of the roadway a turn lane rather than a shoulder with some parking.

Intersection Levels of Service Through 2045

Existing traffic operations with the school were included as part of the Traffic Study for Greenvale Park Elementary School in Northfield, MN, dated November 7, 2022.

Peak hour intersection level of service analysis was performed as part of this study for estimated 2045 traffic conditions near Greenvale Park Elementary School. Intersection level of service (LOS) is a metric used to describe the quality of traffic flow, with levels of service ranging from LOS A (good traffic flow with little delay) to LOS F (very poor traffic flow with major delays).

Peak hour traffic data was not collected as part of this corridor analysis, however data from the following recent traffic studies was referenced when evaluating concept feasibility:

- 2022 Northfield Residential EAW Traffic Analysis (Cedar Meadows residential development)
- 2022 Greenvale Park Elementary School Traffic Study
- 2021 Kraewood Development Traffic Impact Analysis

Traffic data from these three studies was used to estimate 2023/2024 traffic conditions along Lincoln Parkway near the elementary school. 2045 traffic conditions were then estimated by assuming 0.5 percent annual traffic growth through 2045. Note that this traffic data includes estimated full-build traffic from the Kraewood and Cedar Meadows residential developments.

If traffic flow issues associated with pick-up and drop-off operations at the school can be mitigated, acceptable traffic operations (LOS C or better) are expected through 2045, indicating existing roadway capacity is sufficient for anticipated traffic volumes, but this capacity is impacted by the school operations.

Table 1: Estimated 2045 Intersection Levels of Service Near Greenvale Park Elementary

Intersection	2045 AM Peak				
	EB	WB	NB	SB	Overall
Lincoln Pkwy And West School Acccess	A	A	-	A	A
Lincoln Pkwy And Middle School Access	A	A	-	B	B
Lincoln Pkwy And East School Acccess	A	A	-	C	C
Greenvale Ave and Lincoln St	A	A	A	A	A
Greenvale Ave and Spring Street	B	B	A	B	B

Intersection	2045 PM Peak				
	EB	WB	NB	SB	Overall
Lincoln Pkwy And West School Acccess	A	A	-	A	A
Lincoln Pkwy And Middle School Access	A	A	-	B	B
Lincoln Pkwy And East School Acccess	A	A	-	B	B
Greenvale Ave and Lincoln St	A	A	B	A	A
Greenvale Ave and Spring Street	B	C	A	C	B

Crash History

Crash data between 2018 and 2022 was referenced to help guide potential safety-driven improvements in the study area. Crashes by type are summarized in **Table 2** and crashes by severity are summarized in **Table 3**. Note that crashes that were not reported are not reflected in this dataset.

As it relates to potential revisions on Lincoln Parkway and Dresden Avenue, noteworthy crash observations are:

- **Lincoln Parkway/Spring Street and Dresden Avenue**
  - 3 crashes were reported, all of which were run-off-the-road crashes
- **Lincoln Parkway and East School Access**
  - 2 crashes were reported, however no additional details were available in the crash reports
- **General Study Area Observations**
  - No reported fatal or serious injury crashes
  - No reported bicycle or pedestrian crashes

Table 2: 2018-2022 Crashes by Type

Intersection	Total Crashes 2018-2022	Crash Type										
		Pedestrian	Bicycle	Run Off the Road	Other Single Vehicle	Side Swipe Same Direction	Side Swipe Opposite Direction	Rear End	Head On	Left Turn	Angle	Other
Spring St and Greenvale Ave	4	0	0	1	0	0	0	1	0	0	2	0
Spring St and Dresden Ave	3	0	0	3	0	0	0	0	0	0	0	0
Lincoln Pkwy and Elementary School - East Access	2	0	0	0	0	0	0	0	0	0	0	2
Lincoln Pkwy and Elementary School - Middle Access	1	0	0	0	0	0	0	1	0	0	0	0
Dresden Ave and Fremouw Ave	1	0	0	0	0	0	0	0	0	1	0	0
Lincoln Pkwy and Dresden Ave	1	0	0	1	0	0	0	0	0	0	0	0
Lincoln Pkwy and Lathrop Dr (East)	1	0	0	0	0	0	0	1	0	0	0	0
Lincoln St and Ivanhoe Dr	1	0	0	0	0	0	0	0	0	0	0	1
Lincoln Pkwy and Cannon Valley Dr	1	0	0	0	0	0	0	0	0	0	0	1

Table 3: 2018-2022 Crashes by Severity

Intersection	Total Crashes 2018-2022	Severity					
		Fatal	Serious Injury	Minor Injury	Possible Injury	Property Damage Only	Unknown
Spring St and Greenvale Ave	4	0	0	1	0	3	0
Spring St and Dresden Ave	3	0	0	0	1	1	1
Lincoln Pkwy and Elementary School - East Access	2	0	0	0	1	0	1
Lincoln Pkwy and Elementary School - Middle Access	1	0	0	0	1	0	0
Dresden Ave and Fremouw Ave	1	0	0	0	0	1	0
Lincoln Pkwy and Dresden Ave	1	0	0	0	0	1	0
Lincoln Pkwy and Lathrop Dr (East)	1	0	0	0	1	0	0
Lincoln St and Ivanhoe Dr	1	0	0	0	0	1	0
Lincoln Pkwy and Cannon Valley Dr	1	0	0	0	0	0	1

IV. Preliminary Roadway Improvement Concepts

Based on project goals, transportation system analysis, and stakeholder input, multiple corridor improvement concepts for Lincoln Parkway and Dresden Avenue were developed.

Using results from technical analysis and stakeholder input, improvement options are intended to address the following issues:

- Disorderly traffic flow at Greenvale Park Elementary School before and after school
- Concerns about impacts from the existing on-street parking on the north side of Lincoln Parkway adjacent to the school
- Concerns about high traffic speeds on Lincoln Parkway
- Desire for bicycle facilities
- Desire for enhanced pedestrian crossings
- Desire for traffic control revisions at higher-traffic intersections (roundabouts or all-way stop were the most common suggestions)

Concepts 1, 2, and 3 described below were presented at a stakeholder engagement meeting in July 2023. Concept 4 was then developed based on feedback obtained throughout the engagement process.

Design features of each alternative are described below, and are also summarized in evaluation matrices provided in **Table 4** and **Table 5** later in this report.

Design Features for All Options

- Curb extensions at multiple locations on Lincoln Parkway to improve pedestrian crossings
- Rectangular rapid flashing beacon (RRFB) in front of the school
- Sidewalks on both sides of Lincoln Parkway

Additionally, the vision for the corridor is intended to be compatible with the previously identified Lincoln Street and Spring Street connections for in-street bikeways and also be compatible with the long-term vision for off street bikeways on those roadways.

- Lincoln Street – west side two-way in-street bikeway
- Spring Street – east side two-way in-street bikeway

Concept 1 – Design Features

Bike facilities

- Lincoln Parkway
    - Curb-level two-way bike facility near Greenvale Park Elementary
    - On-street two-way bike facility east and west of the school
        - Least cost and impact but harder to maintain than an off-street bikeway due to physical features in the roadway to separate vehicle traffic from bike traffic
        - Eliminates the possibility for any on-street parking on the north side of Lincoln Parkway

- Dresden Avenue
    - Curb-level two-way bike facility that ends at the transit stop
        - Provides a continuous off-street bikeway connection with Lincoln Pkwy
            - More comfort for bicyclists
        - Abrupt transition between Lincoln and Dresden bikeways with traditional intersection

Pedestrian facilities

- Lincoln Parkway
    - Sidewalks on both sides of roadway
    - Curb extensions at multiple locations
    - RRFB in front of school

- Dresden Avenue
    - Sidewalks on both sides of roadway up to Viking Terrace
    - Sidewalk on west side of roadway north of Viking Terrace

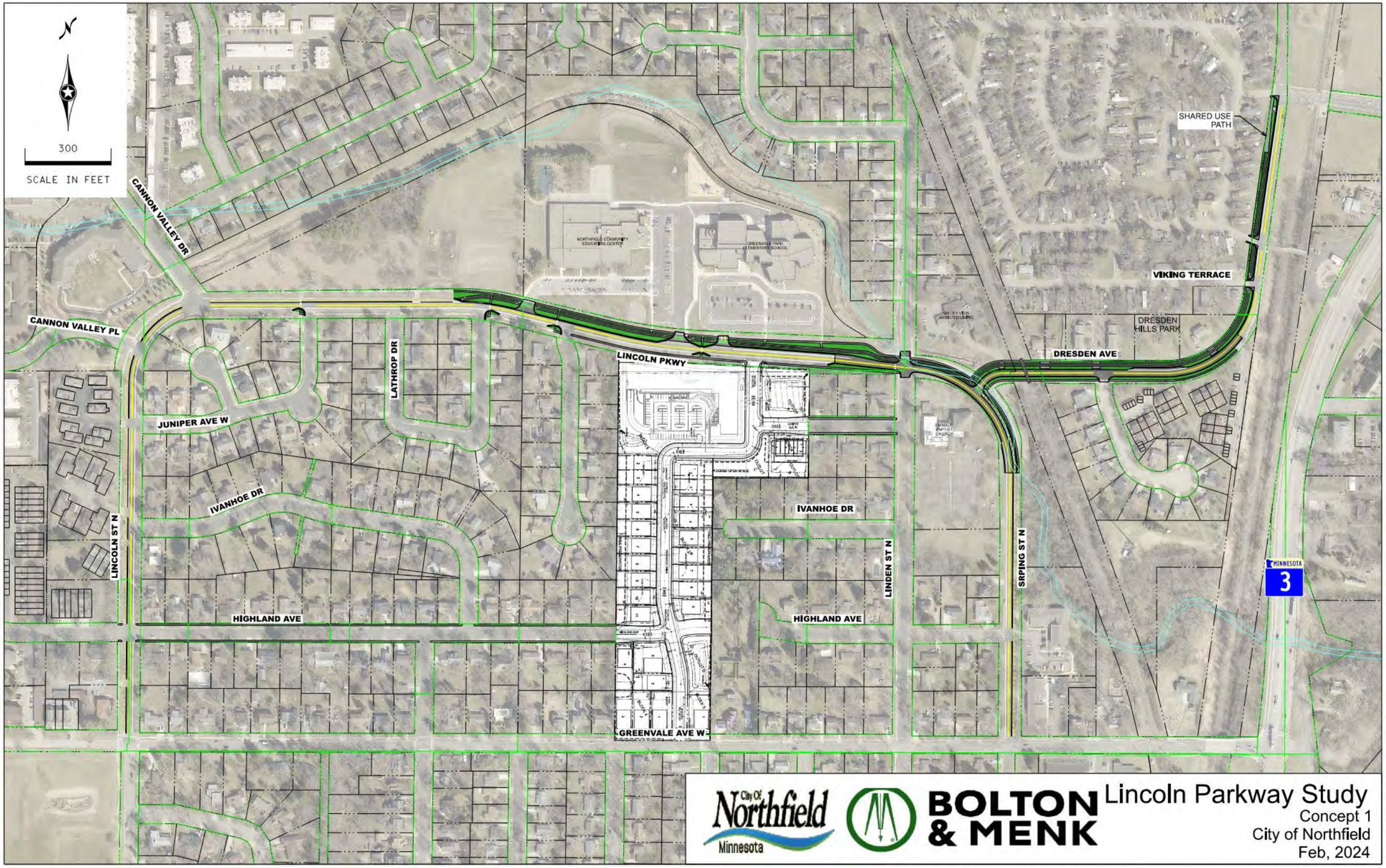
Vehicle traffic features

- Lincoln Parkway
    - Adds westbound right turn lane at the school
    - Curb extension on south shoulder at the school (no eastbound left turn lane at the school)
        - Illegal passing maneuver on the eastbound right shoulder is eliminated
        - Potential for backups without an eastbound left turn lane
    - Options 1B and 1C add an eastbound left turn lane at the school
        - Option 1B shifts eastbound through traffic to the south curb
            - Eliminates the south side on-street parking near the school
        - Option 1C shifts the westbound through traffic north
            - Maintains the parking near the school on the south side of Lincoln Parkway
            - Less boulevard space on the north side of Lincoln Parkway
        - Both options reduce the eastbound backup concerns
    - Parking restricted on the north side of Lincoln Parkway (parking maintained on the south side with the exception of Option 1B)

- Dresden Avenue
    - Parking mostly restricted between Lincoln Parkway and Viking Terrace (maintained on west side of roadway north of Viking Terrace)

Concept 1 is shown in **Figure 10**, with a larger layout provided in **Appendix A**

Figure 10: Roadway Improvement Concept 1



Concept 2 – Design Features

Bike facilities

- Lincoln Parkway
    - Curb-level two-way bike facility
        - More comfortable for bicyclists
        - Trees could be maintained near Cannon Valley Dr
        - Allows for a large boulevard for snow storage, buffer space, and plantings
- Dresden Avenue
    - Curb-level two-way bike facility up to Viking Terrace
        - Provides a continuous off-street bikeway connection with Lincoln Pkwy
            - More comfort for bicyclists
    - Shared use path (west side of roadway) north of Viking Terrace

Pedestrian facilities

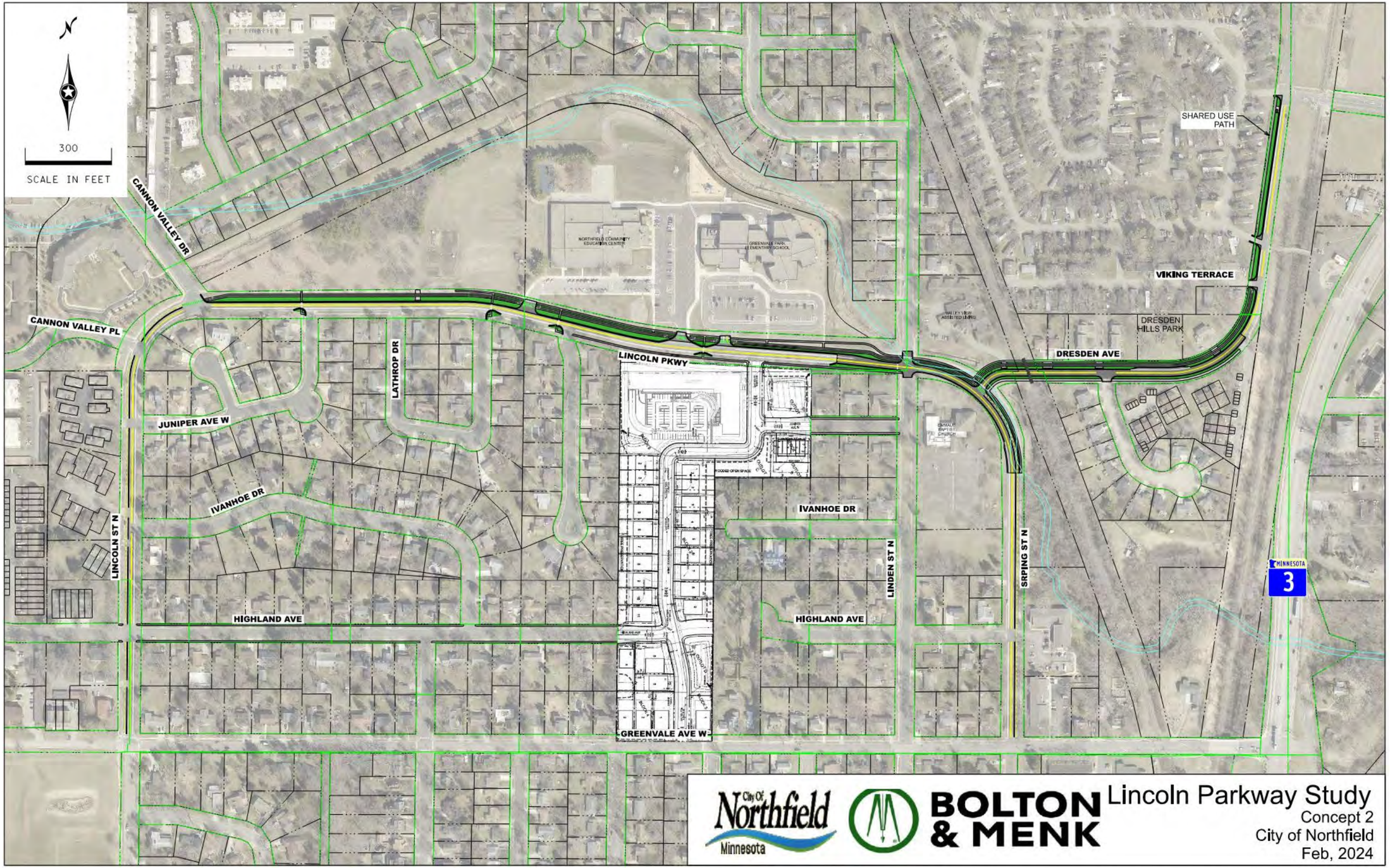
- Lincoln Parkway
    - Sidewalks on both sides of roadway
    - Curb extensions at multiple locations
    - RRFB in front of school
- Dresden Avenue
    - Sidewalks on both sides of roadway up to Viking Terrace
    - Shared use path north of Viking Terrace

Vehicle traffic features

- Lincoln Parkway
    - Adds westbound right turn lane at school
    - Curb extension on south shoulder at the school (no eastbound left turn lane at the school)
        - Illegal passing maneuver on the eastbound right shoulder is eliminated
        - Potential for backups without an eastbound left turn lane
    - Parking restricted on the north side of Lincoln Parkway (maintained on south side)
- Dresden Avenue
    - Parking mostly restricted between Lincoln Parkway and Viking Terrace (maintained on west side of roadway north of Viking Terrace)

Concept 2 is shown in **Figure 11** with a larger layout provided in **Appendix A**

Figure 11: Roadway Improvement Concept 2



Concept 3 – Design Features

Bike facilities

- Lincoln Parkway
    - Curb-level two-way bike facility
        - More comfortable for bicyclists
        - Trees could be maintained near Cannon Valley Drive
        - Allows for a large boulevard for snow storage, buffer space, and plantings
- Dresden Avenue
    - Shared use path on both sides of roadway up to Headley Court
    - Shared use path on west side of roadway between Headley Court and Fremouw Avenue
        - Easier to implement and provides more boulevard space

Pedestrian facilities

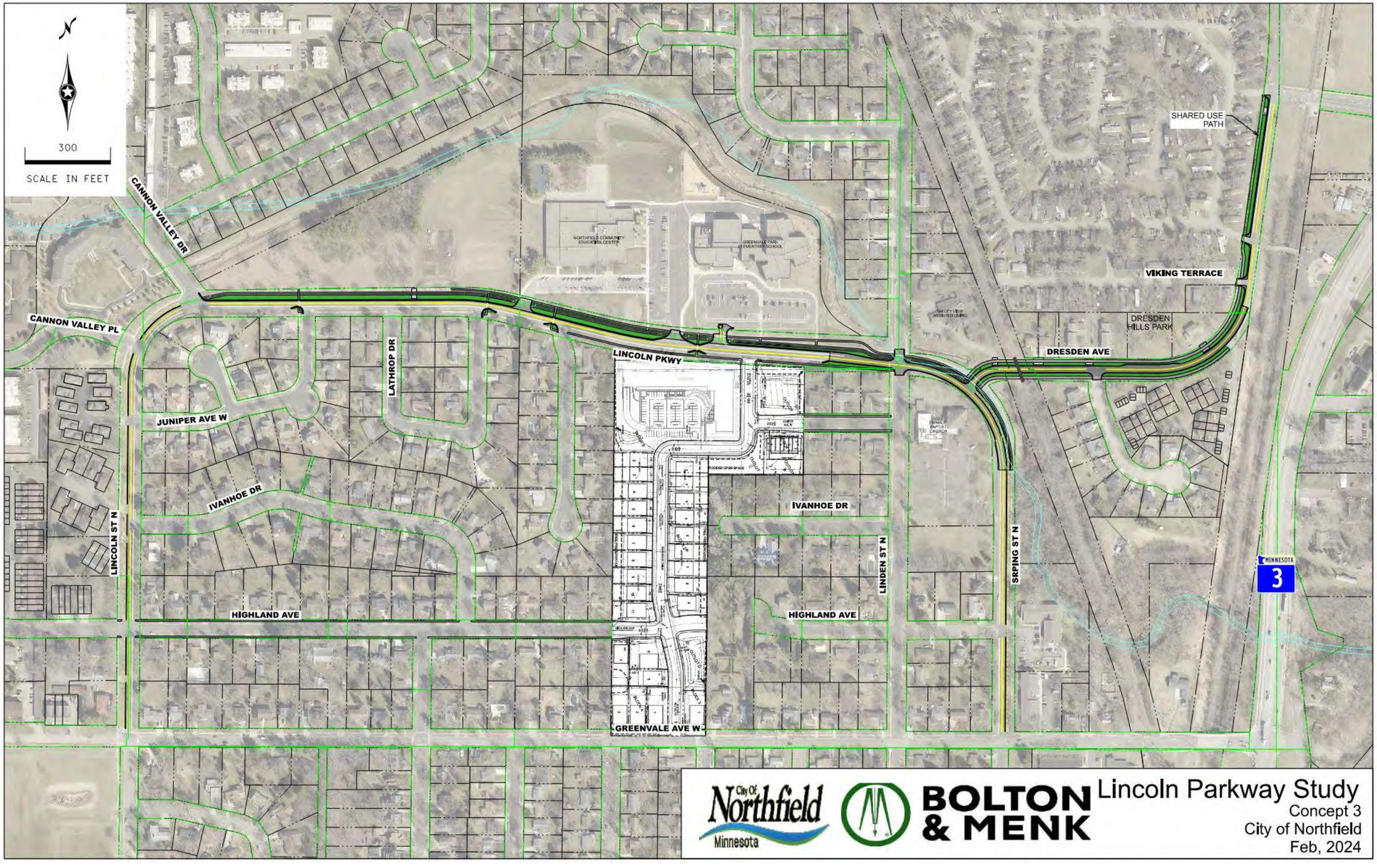
- Lincoln Parkway
    - Sidewalks on both sides of roadway
    - Curb extensions at multiple locations
    - RRFB in front of school
- Dresden Avenue
    - Shared use path on both sides of roadway up to Headley Court
    - Shared use path on west side of roadway between Headley Court and Fremouw Avenue
    - Sidewalk on east side of roadway between Headley Court and Viking Terrace

Vehicle traffic features

- Lincoln Parkway
    - Adds westbound right turn lane at the school
    - Adds a two-lane entry into the school access
        - Provides more capacity for inbound traffic
        - Reduces need for eastbound left turn lane capacity
        - Potential reduction in safety for pedestrians that now need to keep track of more lanes of traffic incoming to the school
        - Potential reduction in safety due to the possibility for illegal dual right turns
    - Parking restricted on the north side of Lincoln Parkway (maintained on south side)
- Dresden Avenue
    - Parking mostly restricted between Lincoln Parkway and Viking Terrace (maintained on west side of roadway north of Viking Terrace)

Concept 3 is shown in **Figure 12**, with a larger layout provided in **Appendix A**

Figure 12: Roadway Improvement Concept 3



Concept 4 – Design Features

Note: This concept was developed in response to feedback received through the Summer 2023 stakeholder engagement

Bike facilities

- Lincoln Parkway
    - Curb-level two-way bike facility
        - More comfortable for bicyclists
        - Trees could be maintained near Cannon Valley Drive
        - Allows for a large boulevard for snow storage, buffer space, and plantings
- Dresden Avenue
    - Shared use path on both sides of roadway up to Headley Court
    - Shared use path on west side of roadway between Headley Court and Fremouw Avenue
    - Roundabout provides a less abrupt transition from Lincoln to Dresden bikeways

Pedestrian facilities

- Lincoln Parkway
    - Sidewalks on both sides of roadway
    - Curb extensions at multiple locations
    - RRFB in front of school
- Dresden Avenue
    - Shared use path on both sides of roadway up to Headley Court
    - Shared use path on west side of roadway between Headley Court and Fremouw Avenue
    - Sidewalk on east side of roadway between Headley Court and Viking Terrace
    - Adds marked pedestrian crossings at Fremouw Avenue and at Dairy Queen trail connection

Vehicle traffic features

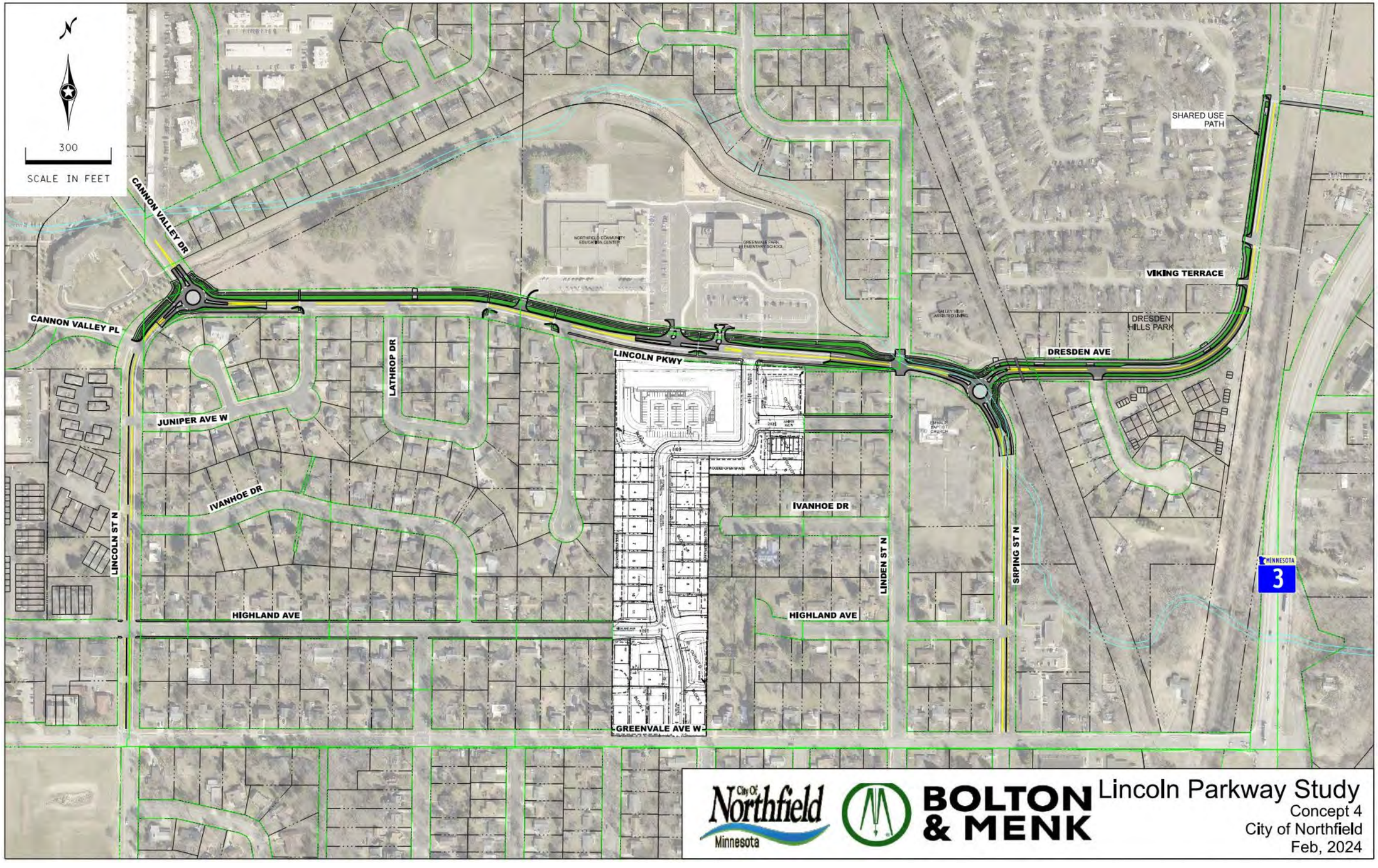
- Lincoln Parkway
    - Adds westbound right turn lane at school
    - Curb extension on south shoulder at the school (no eastbound left turn lane at the school)
        - Illegal passing maneuver on the eastbound right shoulder is eliminated
        - Potential for backups without an eastbound left turn lane
    - Center median on Lincoln Parkway at the school access to increase safety
        - Outbound school traffic must turn right and U-turn at Cannon Valley Dr
            - Potential for diverted traffic to other routes
    - Parking restricted on the north side of Lincoln Parkway (maintained on south side)
- Dresden Avenue
    - Parking mostly restricted between Lincoln Parkway and Viking Terrace (maintained on west side of roadway north of Viking Terrace)
- Mini-roundabouts at the intersections of Lincoln Parkway/Dresden Avenue and Lincoln Parkway/Cannon Valley Drive
    - Improves safety and sightlines due to horizontal curve
    - Reduces traffic speeds

Notable Impacts

- Some tree removal or relocation required in front of the school

Concept 4 is shown in **Figure 13**, with a larger layout provided in **Appendix A**

Figure 13: Roadway Improvement Concept 4



Feedback on Preliminary Concepts

An Open House with the public was held on July 23, 2023 at Emmaus Church. Additionally, there was an online component for the public to provide feedback that remained open into October. Throughout this Summer and Fall 2023 stakeholder engagement process, the following feedback was provided:

- Broad support for pedestrian crossing enhancements on Lincoln Parkway
- Broad support for traffic calming/reduced vehicle speeds on Lincoln Parkway
- Broad support for parking prohibitions adjacent to the school (north side of Lincoln Parkway)
- Broad support for off-street, dedicated bicycle facility
- Roundabouts at Dresden Avenue and at Cannon Valley Drive were supported by many (but not all) stakeholders
- Broad support to remove parking by the current area residents
    - School District and school parents not within walking distance opposed reducing parking

More detailed information from the public engagement process is provided in **Appendix B**.

Dresden Avenue Demonstration Project

In addition to the concepts presented at the Open House, a demonstration concept was presented to the public at the Open House. The city was able to secure a grant to implement a demonstration project along Dresden Avenue to showcase a potential two-way bikeway to the public and receive feedback. The demonstration project included temporary changes to the roadway section including the striping of a two-way bikeway on the north and west sides of Dresden Avenue from Headley Court to Viking Terrace, temporary tube delineators between the traffic lanes and the bikeway, and signing changes as appropriate. This location of the demonstration avoided the railroad crossing to the west and the transit stop to the north. The demonstration was implemented in the fall when school was in session and was revised back to the current condition in October. Comments were received in person by city staff during multiple time periods including:

- Would like more visible/enhanced pedestrian crossing by Dresden Park
- Put in a concrete barrier
- Extend bikeway past railroad tracks to Lincoln Parkway
- Mark the crosswalk by Dairy Queen pedestrian bridge
- Extend bikeway to Fremouw Avenue
- Walking across intersection doesn't feel safe
- Improve lane taper into bikeway
- It is safer for bikes
- Encourages more exercise
- Add bike arrows
- On street parking makes crossing dangerous
- Demonstration transitions are not ideal
- Like the direction the City is going with bike lanes
- Easier for families to bike
- Add basketball court at Dresden
- Crosswalk lights

Figure 14: Dresden Avenue Demonstration Project

V. Preferred Roadway Improvement Option

After obtaining stakeholder feedback on roadway improvement options that were presented to the public and other stakeholders in Summer and Fall 2023, a preferred option that combines the most supported design features, would be anticipated to improve safety, and meet the project goals was identified. The preferred option was then presented to the public in November 2023. After obtaining stakeholder feedback at the November 2023 public meeting, some minor revisions were made to arrive at the concept that is described below.

Preferred Option – Project Elements

The preferred concept is shown in **Figure 15**, with key features described below.

<u>Lincoln Parkway</u>

- Adds two-way, curb-level bicycle facility on north side of Lincoln Parkway (between Dresden Avenue and Cannon Valley Drive)
    - An off-street bicycle facility is typically considered more comfortable for less experienced cyclists, especially children
    - An off-street bicycle facility is consistent with recent practice and previously adopted plans in Northfield
    - An off-street bicycle facility provides for separation of modes and less conflict between the modes
    - Transition to shared space at crossings due to connections with pedestrian walkways
        - Provides a large shared space for bicyclists to turn directions
    - Ties into proposed bicycle facilities on Lincoln Street, Spring Street, and Dresden Avenue (described below)
- Improved pedestrian crossings via the addition of curb extensions at the following locations:
    - Juniper Avenue
    - Lathrop Drive (east junction)
    - Green Meadow Court
    - Greenvale Park Elementary School access
        - To be supplemented by rapid rectangular flashing beacon (RRFB)
- Provides a new sidewalk connection to the elementary school entrance to provide a more direct walking route into the school
- Revises the roadway cross-section with narrower lanes (change from 12 feet to 11 feet) to decrease pedestrian crossing length and reduce traffic speeds
- Adds a westbound right turn lane and an eastbound left turn lane into the school access
    - Reduces congestion that occurs today during school traffic peaks
    - Allows through vehicles to progress through the area
    - Clearer pavement markings are intended to provide more orderly traffic flow into the school
- Adds a channelizing island at the school access
    - More clearly defines the entry and exit lanes, further reducing potential for driver confusion, illegal maneuvers, and disorderly traffic flow

- Provides a two stage pedestrian crossing to split movements and allow pedestrians to focus on one direction of traffic at a time

- Eliminates parking on the north side of Lincoln Parkway
  - Vehicles waiting on Lincoln Parkway in front of the school (especially after school) contributes to existing traffic issues near the school
  - Parking is maintained on the south side of the corridor for neighborhood residents, school visitors, and park users
  - Parking bays could be provided on the north side of the corridor west of the Northfield Community Education Center, however such details should be determined in later phases of project development to best match evolving development trends in the area
- Option to construct a sidewalk on the south side of Lincoln Parkway, west of Juniper Avenue
  - This could alternatively be completed at a later date when a sidewalk is added to the east side of Lincoln Street (south of Cannon Valley Place)
  - Until a sidewalk is constructed along the east side of Lincoln Street, the sidewalk connection on the south side of Lincoln Parkway, west of Juniper Avenue is unlikely to be used by many pedestrians as the more direct connection is along the sidewalk on Juniper Avenue
- Adds a single lane mini-roundabout at the intersection of Lincoln Parkway/Spring Street and Dresden Avenue and a single lane mini-roundabout at the intersection of Lincoln Parkway/Lincoln Street and Cannon Valley Drive
  - Roundabouts provide a traffic calming benefit, reducing vehicle speeds as drivers enter into the Lincoln Parkway corridor near the elementary school
  - Roundabouts will reduce crash potential, especially given the challenging sight lines that currently exist at these intersections that are located on horizontal curves
    - The proposed roundabout at Dresden Avenue is anticipated to mitigate some of the run-off-the-road type crashes that have been observed at the intersection (three crashes between 2018 and 2022)
  - Roundabouts provide alternative routes (via U-turns) for vehicles that desire to avoid longer side-street left turn delays
  - Size of the mini-roundabouts allows for school buses to be accommodated in the lanes and do to not need to use the central island to turn
  - The roundabouts in these locations serve as a gateway into the corridor and are on a horizontal curve
    - A roundabout at Linden Street was considered but is not recommended at this time due to impacts to the drainage ditch on the north side of the intersection and due to the potential for impacts to residential right-of-way on the southwest corner of the intersection
      - A roundabout at this intersection could be considered again in the future when survey is complete and preliminary design is started to see how it fits within the area
      - Roundabout size and turning movements will be a consideration with four legs of entry

- Mature trees between Cannon Valley Drive and Lathrop Drive are proposed to be maintained, contingent on root expanse impacts

Dresden Avenue

- Adds two-way, curb-level bicycle facility on the north and west sides of Dresden Avenue
    - An off-street bicycle facility is typically considered more comfortable for less experienced cyclists, especially children
    - An off-street bicycle facility is consistent with recent practice and previously adopted plans in Northfield
    - Ties into proposed bicycle facility on Lincoln Parkway
    - A demonstration project for a dedicated two-way bicycle facility that was conducted in summer of 2023 was generally well-received by the public
    - Bikeway facility likely transitions to a shared use path on the north end to maintain the transit stop and shelter
- Marked pedestrian crossings across Dresden Avenue provided at:
    - Headley Court/Dresden Hills Park
    - Dairy Queen Trail connection/Viking Terrace access
    - Fremouw Avenue/North Viking Terrace access
- Connect the trail along Fremouw Avenue from Dresden Avenue east across the railroad
- Revises the roadway cross-section with narrower lanes (change from 12 feet to 11 feet) to decrease pedestrian crossing length and reduce traffic speeds
- Provides parking bays near multi-family residential units, near Dresden Hills Park, and on the west side of Dresden Avenue near Viking Terrace (south of the transit stop), but restricts parking elsewhere on Dresden Avenue
    - Railroad right-of-way on the east side of Dresden Avenue impacts the potential for a sidewalk and parking on the east side of the roadway even though there is adequate space between the roadway and the railroad tracks
        - A potential sidewalk extension from the Dairy Queen trail to Fremouw Avenue can be a future consideration that may be possible with an easement
        - More parking on the east side of Dresden Avenue can be considered in the future, but would require the acquisition of right-of-way
- Railroad crossing improvements to increase comfort and safety for pedestrians, bicyclists, and motorists

Bicyclist Intersection Crossing Movement Checks

Given the importance of this project being compatible for bicyclists, a high-level review of bicyclist turning movements at intersection crossings was completed to ensure there are no fatal flaws. According to the MnDOT Bicycle Facility Design Manual it is recommended that a minimum speed of 12 mph be accommodated for turning movements, which equates to a 27-foot radius movement. Depending on how this is to be achieved at the crossings, the design can accommodate the movements but minor adjustments will need to be made during preliminary and final design once survey is complete, utility locations are known, and ADA pedestrian ramp design is being conducted. Information on these bicyclist movement checks at select locations is provided in **Appendix C**.

Figure 15: Preferred Roadway Concept

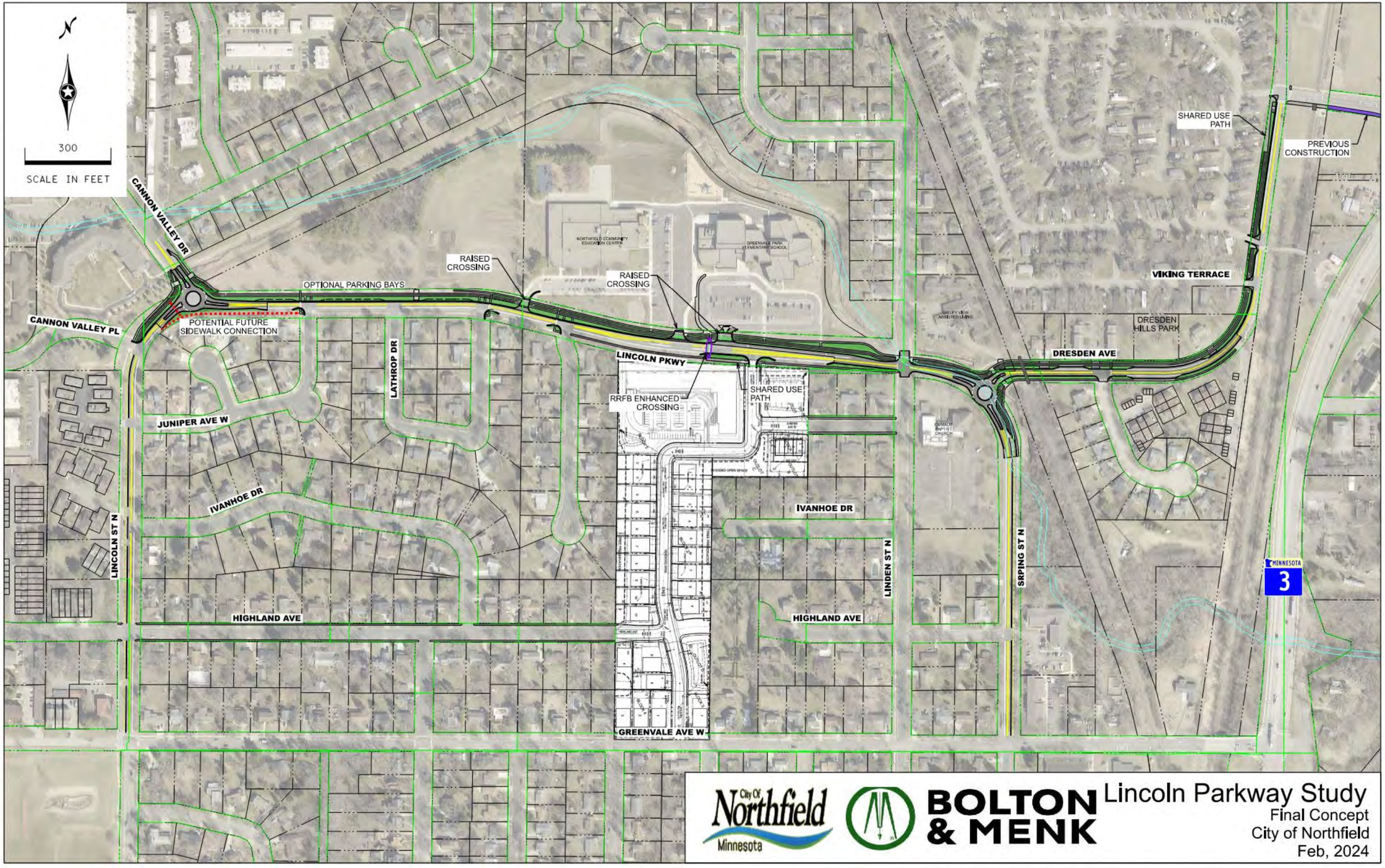


Table 4: Evaluation Matrices for Lincoln Parkway Concepts

Concept	Pedestrian Features		Bicycle Features		Vehicle Traffic Features		Parking Supply	Streetscape Considerations
	Description	+/-	Description	+/-	Description	+/-	+/-	+/-
No Build	• Sidewalk on both sides of corridor	(-) Younger and less experienced cyclists likely also use the existing sidewalk	• No existing bicycle facilities - bicyclists use shoulders	(-) Higher bicyclist exposure to vehicle conflicts, especially when bicyclists use traffic lanes if there are parked cars (-) Not consistent with previous plans	• One travel lane in each direction	(-) Disorderly traffic flow into and out of the school	(+) Both sides of roadway	(+) Trees maintained
Concept 1	• Sidewalk on both sides of corridor • Shortened pedestrian crossings with curb extensions • Concept 1B eliminates curb extension at School Driveway Crossing • Pedestrian beacon in front of school (Rapid Rectangular Flashing Beacon)	(+) Improved visibility of pedestrians (+) Lower vehicle speeds expected (-) Eliminated curb extension under Concept 1B (+) Improved driver yielding rates with pedestrian beacon	• Curb-level, two-way bicycle facility near school • Median-separated, two-way bicycle facility east and west of school (on-street)	(+) Physical separation between bicyclists and moving traffic (+) Less cost and impact than other options (+) Consistent with the Planned Walking and Bicycling Network (-) Increased maintenance needs compared to other options	• One travel lane in each direction • Long westbound right turn lane into school • Eastbound left turn lane provided in Concepts 1B and 1C	(+) Mostly unchanged from existing, but clear right turn lane into the school should reduce confusion (-) Curb extension and one through lane can back up traffic due to a left turning vehicle (Concept 1A) (+) Eastbound left turn lane improves traffic flow (Concepts 1B and 1C)	(+) Parking maintained on south side of roadway (-) Parking restricted on north side of roadway (-) Parking restricted on south side in Concept 1B	(+) Trees maintained
Concept 2	• Sidewalk on both sides of corridor • Shortened pedestrian crossings with curb extensions • Pedestrian beacon in front of school (Rapid Rectangular Flashing Beacon)	(+) Improved visibility of pedestrians (+) Lower vehicle speeds expected (+) Improved driver yielding rates with pedestrian beacon	• Curb-level two-way bicycle facility between Dresden Ave and Cannon Valley Dr • Transitions to median-separated, two-way bicycle facility southeast of Dresden Ave and southwest of Cannon Valley Dr (on-street)	(+) Physical separation between bicyclists and moving traffic (+) Consistent with the Planned Walking and Bicycling Network	• One travel lane in each direction • Long westbound right turn lane into school	(+) Mostly unchanged from existing, but clear right turn lane into the school should reduce confusion	(+) Parking maintained on south side of roadway (-) Parking restricted on north side of roadway	(+) Trees maintained (+) More boulevard space for snow storage
Concept 3	• Sidewalk on both sides of corridor • Shortened pedestrian crossings with curb extensions • Pedestrian beacon in front of school (Rapid Rectangular Flashing Beacon)	(+) Improved visibility of pedestrians (+) Lower vehicle speeds expected (+) Improved driver yielding rates with pedestrian beacon	• Curb-level two-way bicycle facility between Dresden Ave and Cannon Valley Dr • Transitions to median-separated, two-way bicycle facility southeast of Dresden Ave and southwest of Cannon Valley Dr (on-street)	(+) Physical separation between bicyclists and moving traffic (+) Consistent with the Planned Walking and Bicycling Network	• One travel lane in each direction • Long westbound right turn lane into school • Second entry lane at school entrance	(+) Clear westbound right turn lane should reduce driver confusion (+) Higher entrance capacity with second entry lane (-) Increased sideswipe crash potential with concurrent eastbound and westbound turning movements into driveway	(+) Parking maintained on south side of roadway (-) Parking restricted on north side of roadway	(+) Trees maintained (+) More boulevard space for snow storage
Concept 4	• Sidewalk on both sides of corridor • Shortened pedestrian crossings with curb extensions • Pedestrian beacon in front of school (Rapid Rectangular Flashing Beacon)	(+) Improved visibility of pedestrians (+) Lower vehicle speeds expected, additional traffic calming benefit from roundabouts at Dresden Ave and Cannon Valley Drive (+) Improved driver yielding rates with pedestrian beacon	• Curb-level two-way bicycle facility between Dresden Ave and Cannon Valley Dr • Transitions to median-separated, two-way bicycle facility southeast of Dresden Ave and southwest of Cannon Valley Dr (on-street)	(+) Physical separation between bicyclists and moving traffic (+) Consistent with the Planned Walking and Bicycling Network	• Roundabouts at Cannon Valley Drive and at Dresden Avenue • One travel lane in each direction • Long westbound right turn lane into school • Left turn movements exiting the school are prohibited via medians and channelizing islands	(+) Roundabouts slow speeds and improve sight lines (+) Roundabouts mitigate issues associated with restricted turning movements (+) Clear westbound right turn lane should reduce driver confusion (-) Indirect travel paths for vehicles that desire to turn left out of the school	(+) Parking maintained on south side of roadway (-) Parking restricted on north side of roadway	(-) Some tree removal required (+) More boulevard space for snow storage
Draft Recommendation	• Sidewalk on both sides of corridor • Shortened pedestrian crossings with curb extensions • Pedestrian beacon in front of school (Rapid Rectangular Flashing Beacon)	(+) Improved visibility of pedestrians (+) Lower vehicle speeds expected, additional traffic calming benefit from roundabouts at Dresden Ave and Cannon Valley Drive (+) Improved driver yielding rates with pedestrian beacon	• Curb-level two-way bicycle facility between Dresden Ave and Cannon Valley Dr • Transitions to median-separated, two-way bicycle facility southeast of Dresden Ave and southwest of Cannon Valley Dr (on-street)	(+) Physical separation between bicyclists and moving traffic (+) Consistent with the Planned Walking and Bicycling Network	• Roundabouts at Cannon Valley Drive and at Dresden Avenue • One travel lane in each direction • Long westbound right turn lane into school • Eastbound left turn lane into school	(+) Roundabouts slow speeds and improve sight lines (+) Roundabouts provide alternative routes for drivers that desire to avoid longer exiting left turn delays (+) Clear turn lanes into the school should reduce driver confusion, added left turn lane moves this traffic from the through traffic stream	(+) Parking maintained on south side of roadway (-) Parking restricted on north side of roadway from school to Linden (+) Potential parking bays on north side (space in boulevard)	(-) Some tree removal required (+) More boulevard space for snow storage

Color legend:

Improvements with minimal downsides
Improvements with some downsides, but still mostly positive changes
Balanced positives and negatives
Poor performance - improvements should be considered

Table 5: Evaluation Matrices for Dresden Avenue Concepts

Concept	Pedestrian Features		Bicycle Features		Vehicle Traffic Features		Parking Supply	Streetscape Considerations
	Description	+/-	Description	+/-	Description	+/-	+/-	+/-
No Build	• Sidewalk on both sides of corridor up to Viking Terrance • Sidewalk on west side of corridor between Viking Terrace and Fremouw Ave	(-) Younger and less experienced cyclists likely also use the existing sidewalk	• No existing bicycle facilities - bicyclists use shoulders	(-) Higher bicyclist exposure to vehicle conflicts, especially when bicyclists use traffic lanes if there are parked cars	• One travel lane in each direction	(+) No existing vehicle traffic flow issues	(+) Parking allowed on both sides of roadway	(+) No Impacts
Concept 1	• Sidewalk on both sides of corridor up to Viking Terrance • Sidewalk on west side of corridor between Viking Terrace and Fremouw Ave	(+) Reduced conflict potential with bicyclists due to separate bicycle facility	• Curb-level, two-way bicycle facility	(+) Physical separation between bicyclists and moving traffic (+) Dedicated bicycle space (-) Increased maintenance needs	• One travel lane in each direction	(+) No existing vehicle traffic flow issues	(-) Parking mostly restricted between Lincoln Pkwy and Viking Terrance (parking bay provided near Dresden Hills Park) (+) Parking maintained on west side of corridor, north of Viking Terrace	(+) Minimal impacts (-) Minor right-of-way needs, but no building impacts
Concept 2	• Sidewalk on both sides of corridor up to Viking Terrance • Shared use path on west side of corridor between Viking Terrace and Fremouw Ave	(+) Reduced conflict potential with bicyclists due to separate bicycle facility (south of Viking Terrace) (+) Wider shared space with bicyclists that do not want to ride on the roadway north of Viking Terrance	• Curb-level, two-way bicycle facility up to Viking Terrace • Shared use path on west side of corridor between Viking Terrace and Fremouw Ave (ties into two-way bicycle facility)	(+) Physical separation between bicyclists and moving traffic (+) Dedicated bicycle space south of Viking Terrace, more space to share with pedestrians north of Viking Terrace (-) Increased maintenance needs	• One travel lane in each direction	(+) No existing vehicle traffic flow issues	(-) Parking mostly restricted between Lincoln Pkwy and Viking Terrance (parking bay provided near Dresden Hills Park) (+) Parking maintained on west side of corridor, north of Viking Terrace	(+) Minimal impacts (-) Minor right-of-way needs, but no building impacts
Concept 3	• Shared use path on both sides of corridor up to Headley Ct • Shared use path on west side of corridor between Headley Ct and Fremouw Ave • Sidewalk on east side of corridor between Headley Ct and Viking Terrace	(+) Wider shared space with bicyclists that do not want to ride on the roadway	• Shared use path on both sides of corridor up to Headley Ct • Shared use path on west side of corridor between Headley Ct and Fremouw Ave	(+) Physical separation between bicyclists and moving traffic (+) More space to share with pedestrians (-) Increased maintenance needs	• One travel lane in each direction	(+) No existing vehicle traffic flow issues	(-) Parking mostly restricted between Lincoln Pkwy and Viking Terrance (parking bay provided near Dresden Hills Park) (+) Parking maintained on west side of corridor, north of Viking Terrace	(+) Minimal impacts (-) Minor right-of-way needs, but no building impacts. Reduced right-of-way needs compared to Concepts 1 and 2
Concept 4	• Shared use path on both sides of corridor up to Headley Ct • Shared use path on west side of corridor between Headley Ct and Fremouw Ave • Sidewalk on east side of corridor between Headley Ct and Viking Terrace	(+) Wider shared space with bicyclists that do not want to ride on the roadway	• Shared use path on both sides of corridor up to Headley Ct • Shared use path on west side of corridor between Headley Ct and Fremouw Ave	(+) Physical separation between bicyclists and moving traffic (+) More space to share with pedestrians (-) Increased maintenance needs	• One travel lane in each direction • Roundabout at Dresden Ave	(+) No existing vehicle traffic flow issues (+) Roundabout slows speeds and improve sight lines	(-) Parking mostly restricted between Lincoln Pkwy and Viking Terrance (parking bay provided near Dresden Hills Park) (+) Parking maintained on west side of corridor, north of Viking Terrace	(+) Minimal impacts (-) Minor right-of-way needs, but no building impacts. Reduced right-of-way needs compared to Concepts 1 and 2
Draft Recommendation	• Sidewalk on both sides of corridor up to Viking Terrance • Sidewalk on west side of corridor between Viking Terrace and Fremouw Ave	(+) Reduced conflict potential with bicyclists due to separate bicycle facility	• Curb-level, two-way bicycle facility	(+) Physical separation between bicyclists and moving traffic (+) Dedicated bicycle space (-) Increased maintenance needs	• One travel lane in each direction • Roundabout at Dresden Ave	(+) No existing vehicle traffic flow issues (+) Roundabout slows speeds and improve sight lines	(-) Parking mostly restricted between Lincoln Pkwy and Viking Terrance (parking bays provided near Dresden Hills Park and by multifamily residential units near the park) (+) Parking maintained on west side of corridor, north of Viking Terrace	(+) Minimal impacts (-) Minor right-of-way needs, but no building impacts

Color legend:

Improvements with minimal downsides
Improvements with some downsides, but still mostly positive changes
Balanced positives and negatives
Poor performance - improvements should be considered

VI. Implementation/Phasing Plan

While project funding has yet to be secured, a proposed implementation plan has been prepared to help prioritize specific project elements as funding becomes available. Initial cost estimates are based on 2023 prices, with costs shown below adjusted to 2028 dollars. When converting to future year dollars, the annual inflation is assumed to be 5.0%.

- Phase 1
  - Pedestrian crossing in front of school + rectangular rapid flashing beacon
  - Curb extensions
  - School sidewalk extension
  - Estimated 2028 project cost: $390,000
- Phase 2
  - Lincoln Parkway reconstruction
  - Lincoln Parkway bikeway from Cannon Valley Dr/Lincoln St to Spring St/Dresden Ave
  - Turn lanes into school
  - School access median
  - Curb extensions
  - Estimated 2028 project cost: $4.0 million to $6.3 million (depending on extent of reconstruction activities, such as a mill and overlay versus full reconstruction and whether includes continuous lighting)
    - Continuous lighting is $450,000 (lighting already at pedestrian crossings)
  - Transition from curb level bikeway to on-street two-way bikeway occurs at Cannon Valley Drive/Lincoln Street and at Spring Street/Dresden Avenue until Phase 4 complete.
- Phase 3
  - Dresden Avenue bikeway and roadway reconstruction
  - Estimated 2028 project cost: $3.2 million to $4.3 million (depending on extent of reconstruction activities, such as a mill and overlay versus full reconstruction and whether includes continuous lighting)
    - Continuous lighting adds $310,000 (lighting already at pedestrian crossings)
  - Fremouw Ave railroad trail crossing and Dresden Ave railroad crossing included
    - Fremouw RR crossing: 2028 construction cost estimated at $100,000
    - Dresden RR crossing: 2028 construction cost estimated at $360,000
- Phase 4
  - Mini-Roundabouts on Lincoln Parkway at Cannon Valley Drive and at Dresden Avenue
  - Lincoln Parkway/Lincoln Street/Cannon Valley Drive Mini-Roundabout
    - Estimated 2028 project cost: $1.6 million
  - Lincoln Parkway/Spring Street/Dresden Avenue Mini-Roundabout
    - Estimated 2028 project cost: $2.1 million
    - This assumes the bikeway on the NE corner legs and the RR crossing updates are completed under previous phases. ADA and curb updates to previous work will be completed in Phase 4 as consistent with the mini-roundabout geometrics.

The phasing plan is shown visually in **Figure 16**. Detailed cost estimate information is provided in **Appendix D**.

Figure 16: Phasing/Implementation Plan

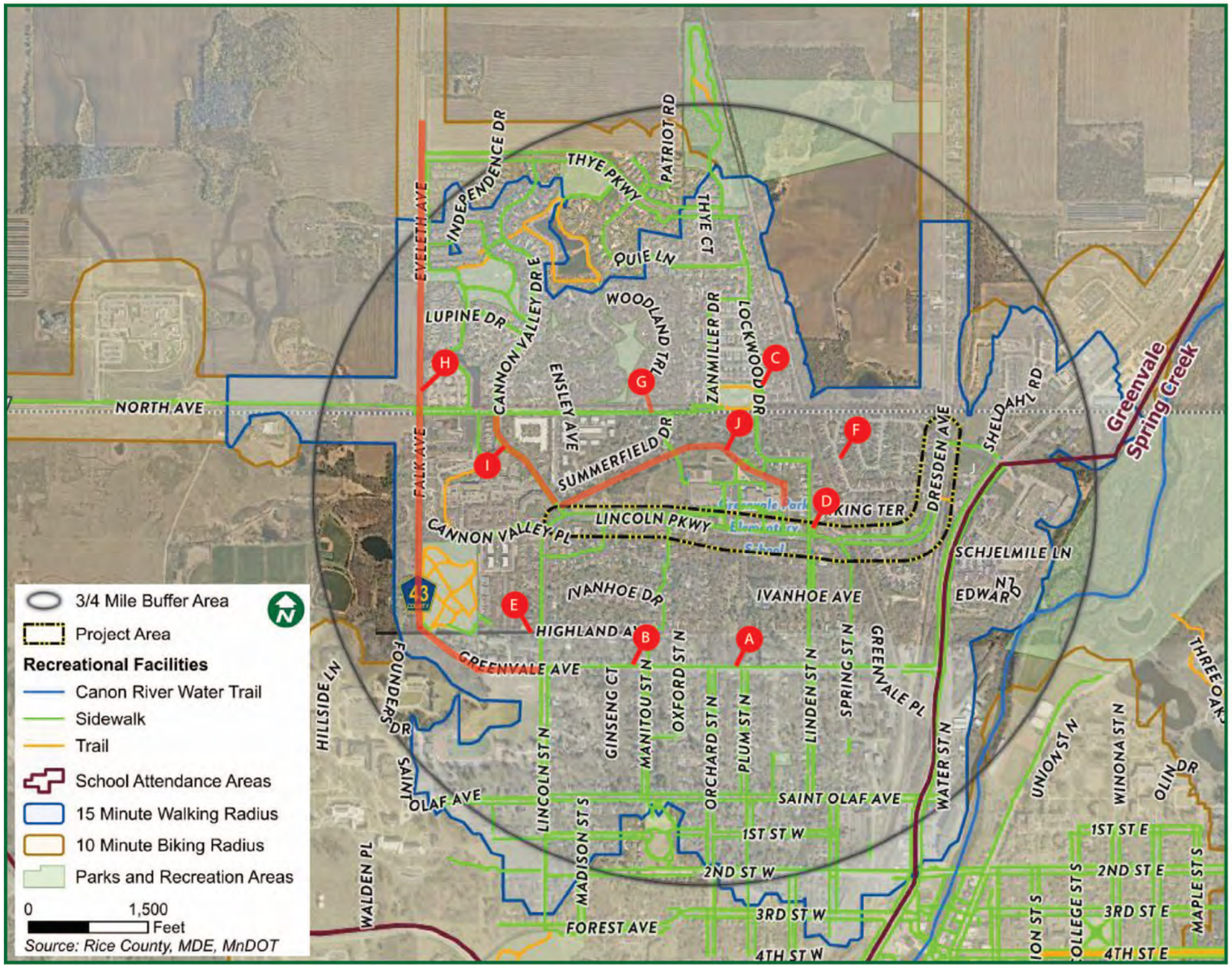
VII. Safe Routes to School Review

While not incorporated into the implementation plan described above for improvements on Lincoln Parkway and Dresden Avenue, there are several other multimodal improvements that should be considered to provide safe and comfortable walking and biking connections to Greenvale Park Elementary School and to facilities on Lincoln Parkway and Dresden Avenue. These improvements will support Safe Routes to School and will promote safer movements of pedestrians and bicyclists throughout Northfield. These improvements should be incorporated into adjacent Capital Improvement Projects or be implemented when funding becomes available. The improvements are shown and described in **Figure 17**.

Figure 17: Safe Routes to School Review

SAFE ROUTES TO SCHOOL

3/4 MILE BUFFER POTENTIAL CONSIDERATIONS



Legend

A. New crosswalk location with pedestrian crossing signage

B. Add painted crosswalks
- -All-way stop controlled intersection, no additional signage needed

C. Add advanced pedestrian crossing signs

D. Consider new connection path to the school building

E. Install sidewalk connections
- -Highland Ave from Ivanhoe Dr to Kraewood Development
- -Highland Ave west of Lincoln St
- -Orchard St N between St. Olaf Ave and Orchard Ct

F. Consider pedestrian access across railroad tracks
- -Agreements would be needed with the Railroad and adjacent property owners

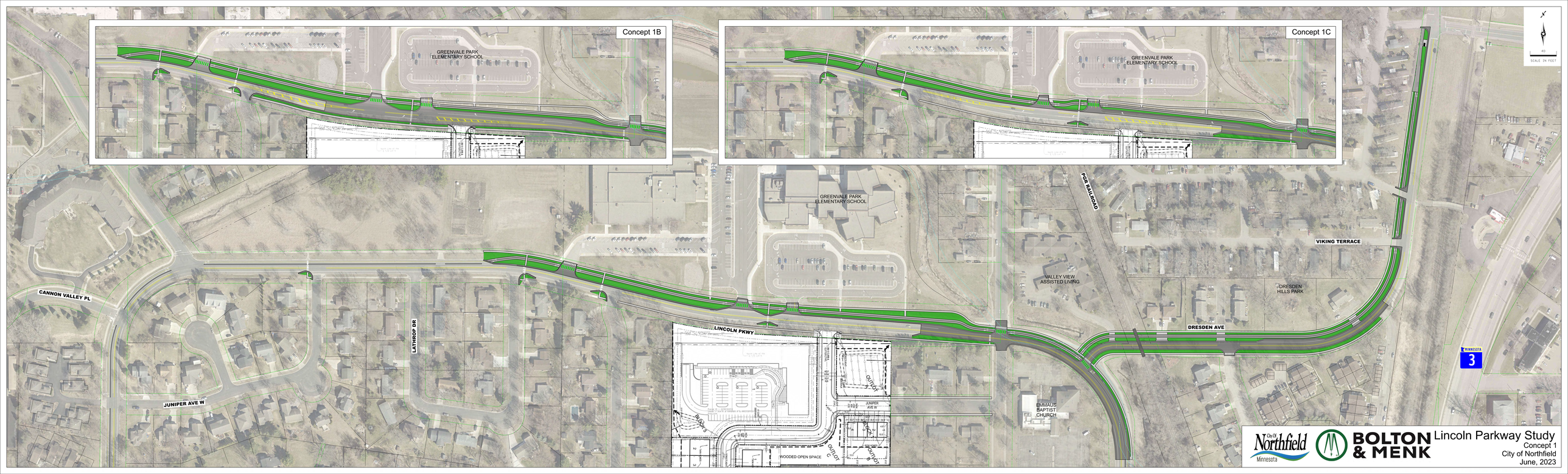
G. Add pedestrian crossing and curb ramps
- -Add curb ramps, crosswalk, and pedestrian crossing signage across North Ave at Woodland Tr (east intersection)

H. Off-street recreational trail
- -Consider new shared-use path along County Road 43/23 between Lincoln St and Thye Pkwy

I. Add bike infrastructure
- -An on-street protected bikeway to match other infrastructure in the area (North Ave and future Lincoln Pkwy bike connections)
- -This will complete a safe connection to Greenvale Park Elementary School from North Ave, which has on-street bike lanes and an off-street path to the west of County Road 43/23

J. Consider potential trail
- -Install trail parallel to waterway on the north side of the school property

Appendix A: Roadway Improvement Concepts

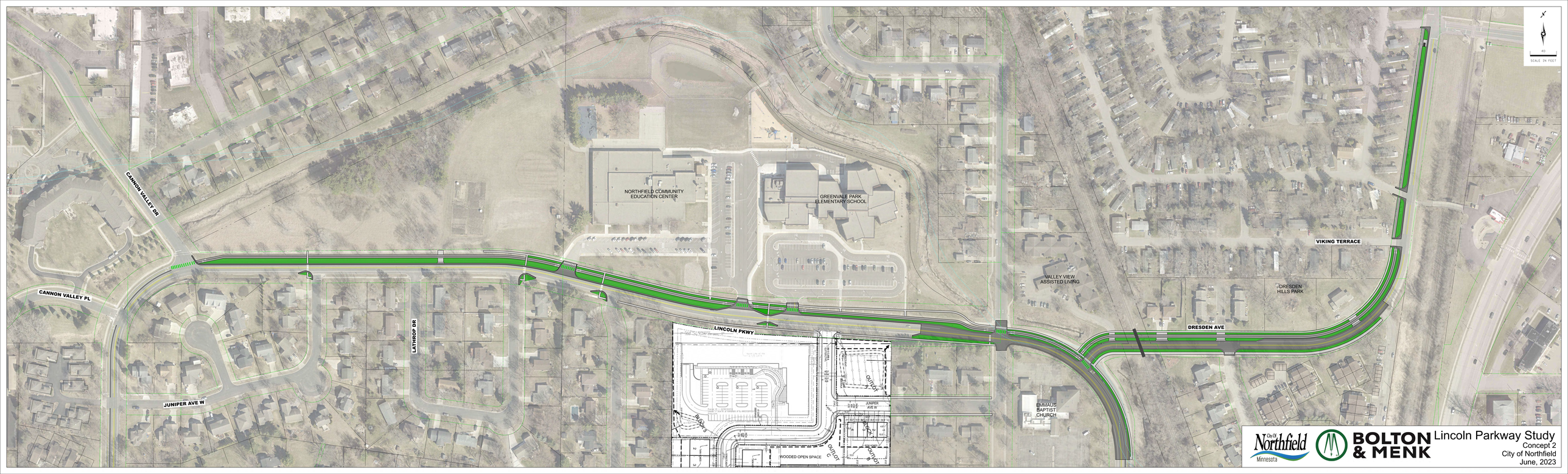


City of Northfield Minnesota

BOLTON & MENK

Lincoln Parkway Study

Concept 1
City of Northfield
June, 2023



City of Northfield Minnesota

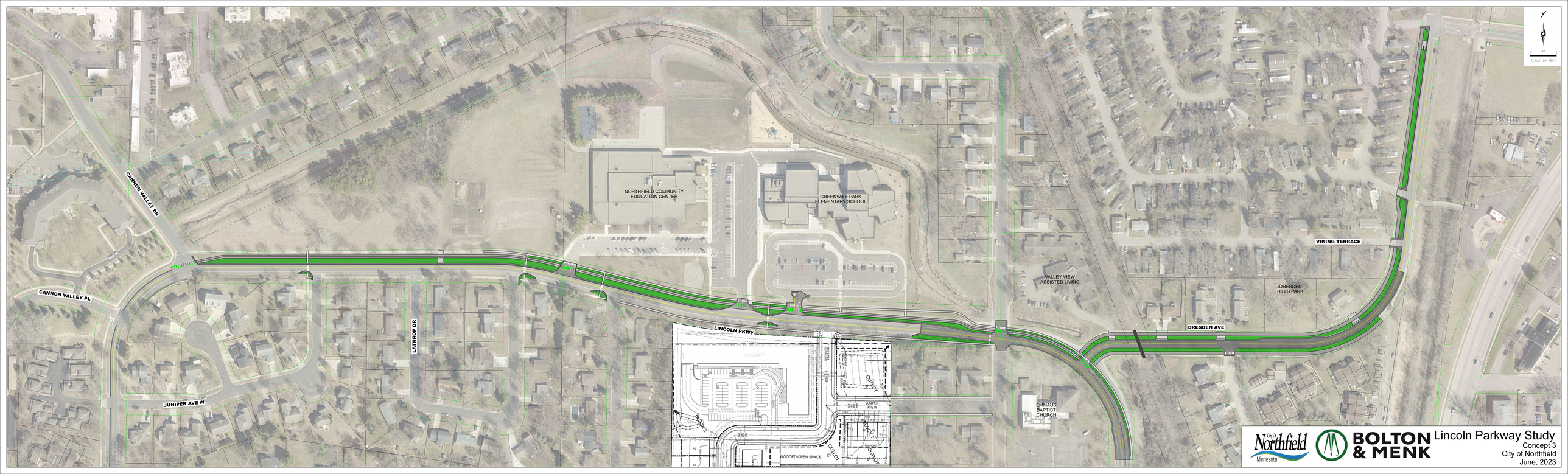
BOLTON & MENK

Lincoln Parkway Study

Concept 2

City of Northfield

June, 2023



City of Northfield Minnesota

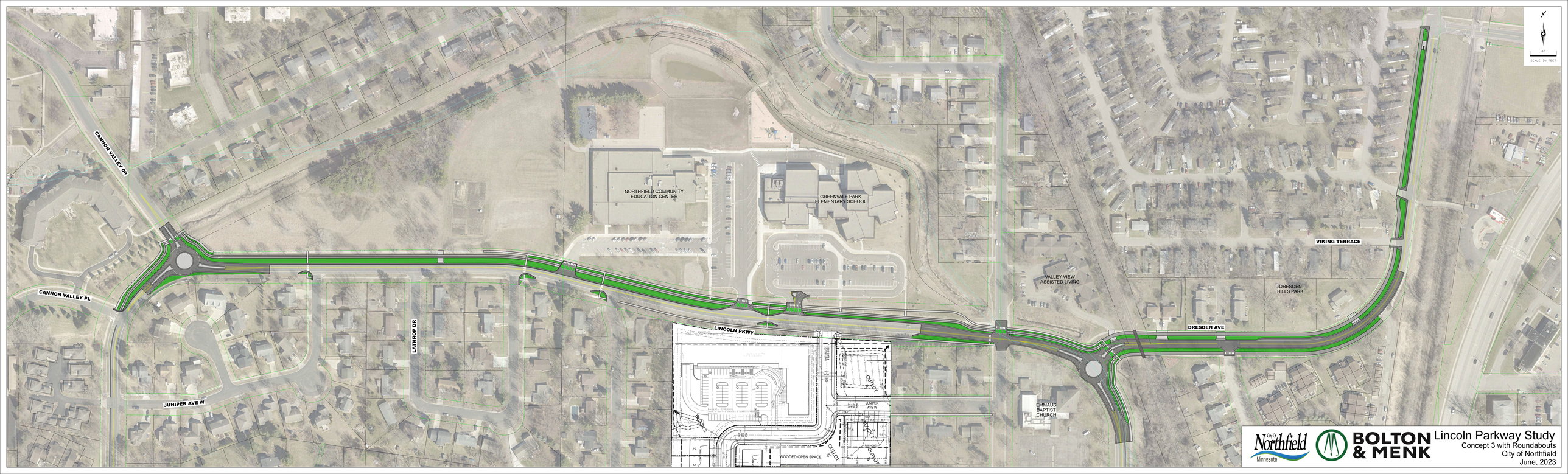
BOLTON & MENK

Lincoln Parkway Study

Concept 3

City of Northfield

June, 2023



City of Northfield Minnesota

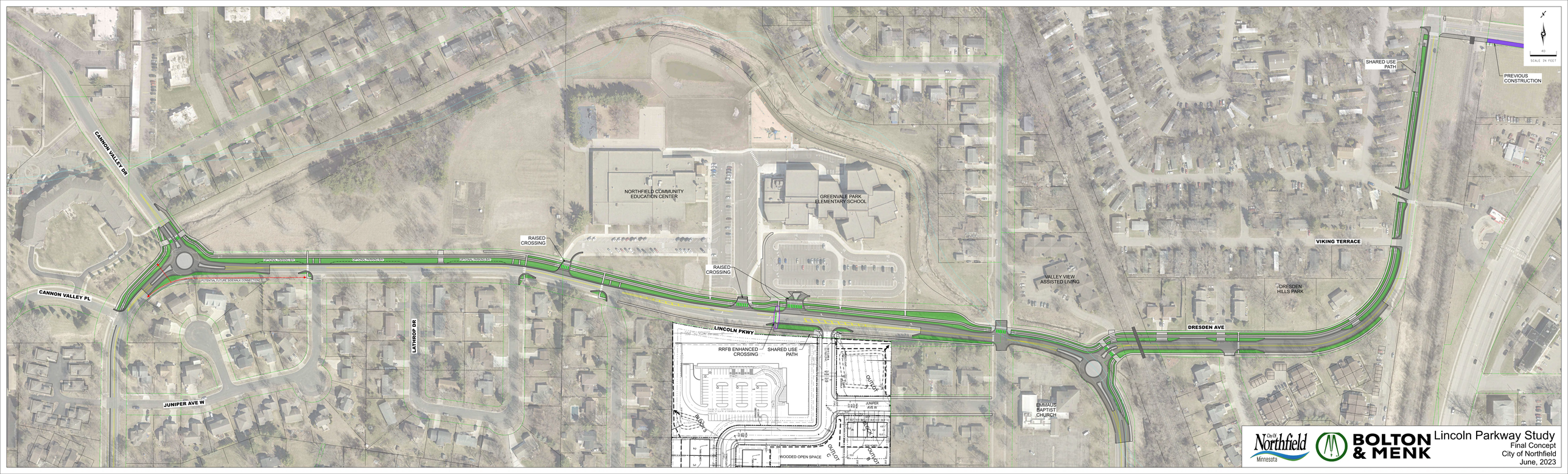
BOLTON & MENK

Lincoln Parkway Study

Concept 3 with Roundabouts

City of Northfield

June, 2023



City of Northfield Minnesota

BOLTON & MENK

Lincoln Parkway Study

Final Concept
City of Northfield
June, 2023

Appendix B: Public Engagement Summary

Lincoln Parkway Traffic Analysis

City Of Northfield Minnesota

PUBLIC ENGAGEMENT SUMMARY

Phase 1 | June – August, 2023

Project Background

The Lincoln Parkway Traffic Impact Analysis is intended to understand the effectiveness of the short-term improvement measures completed in 2021, develop future options and recommendations for Lincoln Parkway to increase multimodal connections and safety, and determine multimodal network improvements for safe routes to school.

Engagement by the Numbers

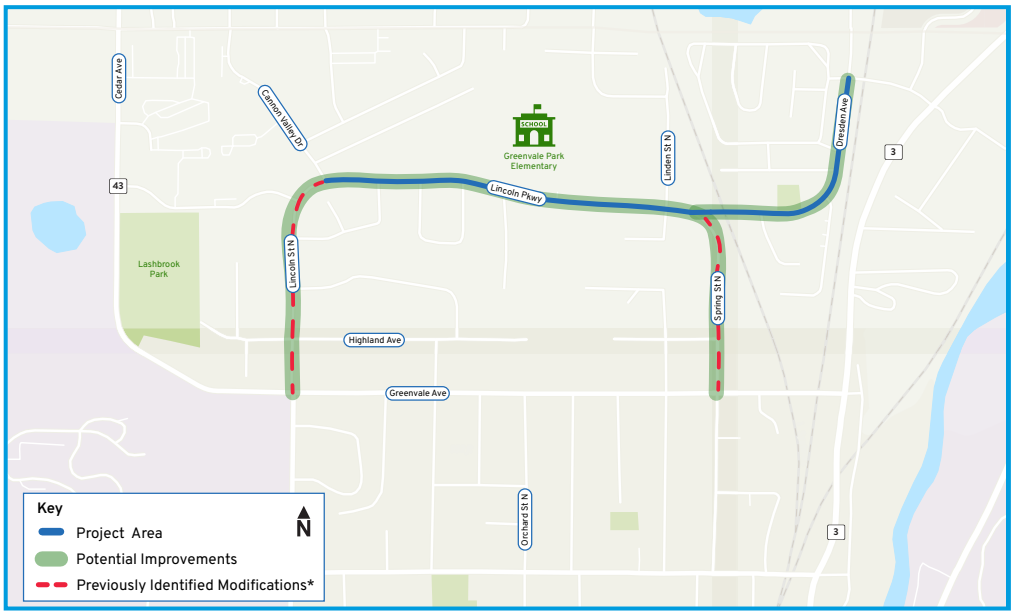
53
Open House Attendees

5
INPUTiD Interactions

75
Comments Received

85
Website Views

Study Area



Engagement Strategy

The project team used a combination of digital and in-person engagement tools to reach the community where they are and learn more about their experiences in the study area.

The digital engagement tools include a project website, social media posts, and an INPUTiD™ interactive project map. The map highlights the study area and gives community members the opportunity to identify concerns, ideas, and general feedback by leaving comments or reacting to others' comments. The project website also has the option to subscribe to email or text project updates.

Several public open houses will be held throughout the project process to learn more from the community, offer solutions and to hear their concerns.

Engagement Goals

- Understand and document perceived problems
- Collect input regarding the concerns, priorities, and preferences within the study area
- Share and discuss possible improvements
- Document a recommended or preferred alternative

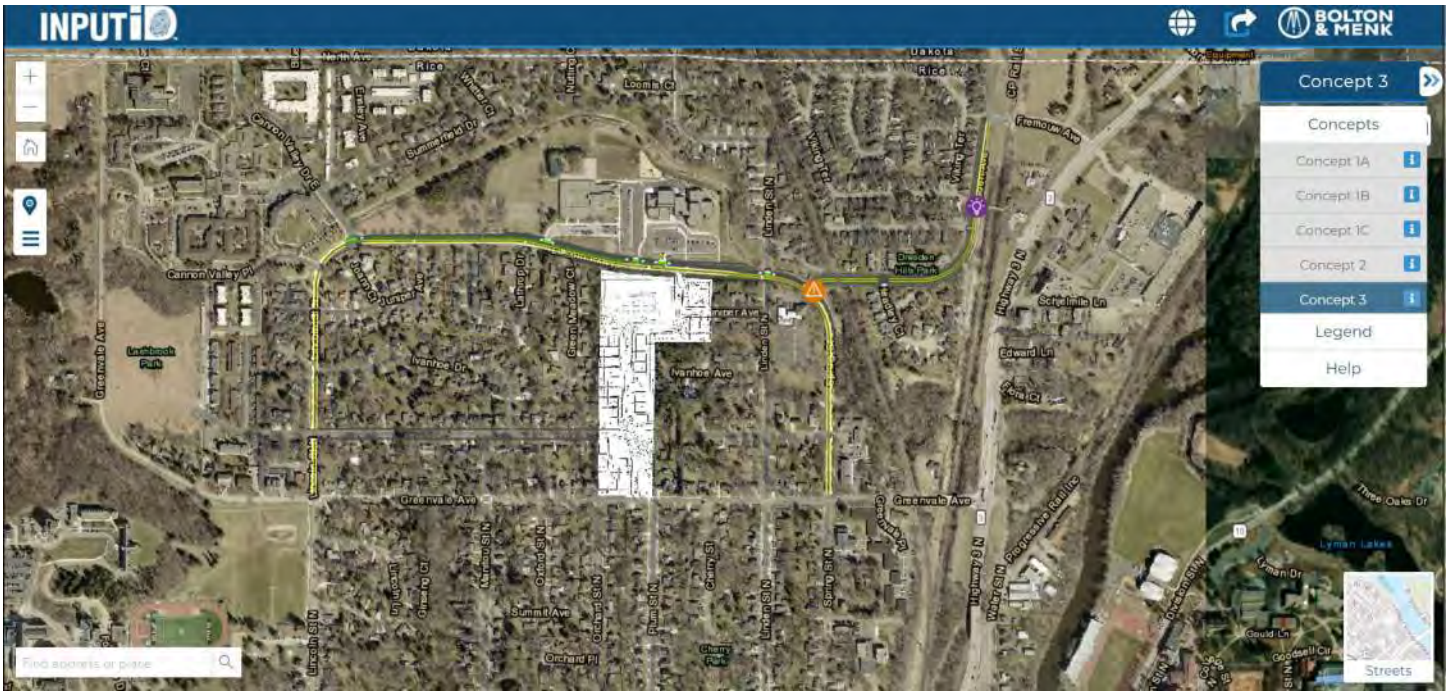
Lincoln Parkway Traffic Analysis

City Of Northfield Minnesota

INPUTiD Interactive Map

The INPUTiD™ interactive map provides the opportunity for residents to leave comments and react to other comments on transportation issues within the project study area. Users choose the category that closely applies to their feedback and drop comments in specific locations on the map. Category options are bike, pedestrian, transit, vehicle/road connections, access concerns, improvement suggestions, safety issues, and other concerns.

There have been 5 comments as of August 4th, 2023. The map is available in a digital format via the project website.



Concept 1A

- Happy to see traffic calming measures by the school
- People drive far too fast on Lincoln Parkway and over the tracks on Dresden Ave

Concept 1B

- Having the end of a turn lane past the crosswalk by the across from Greenvale seems like it will encourage people to park where they are blocking the crosswalk

Concept 1C

No INPUTiD comments received

Concept 2

No INPUTiD comments received

Concept 3

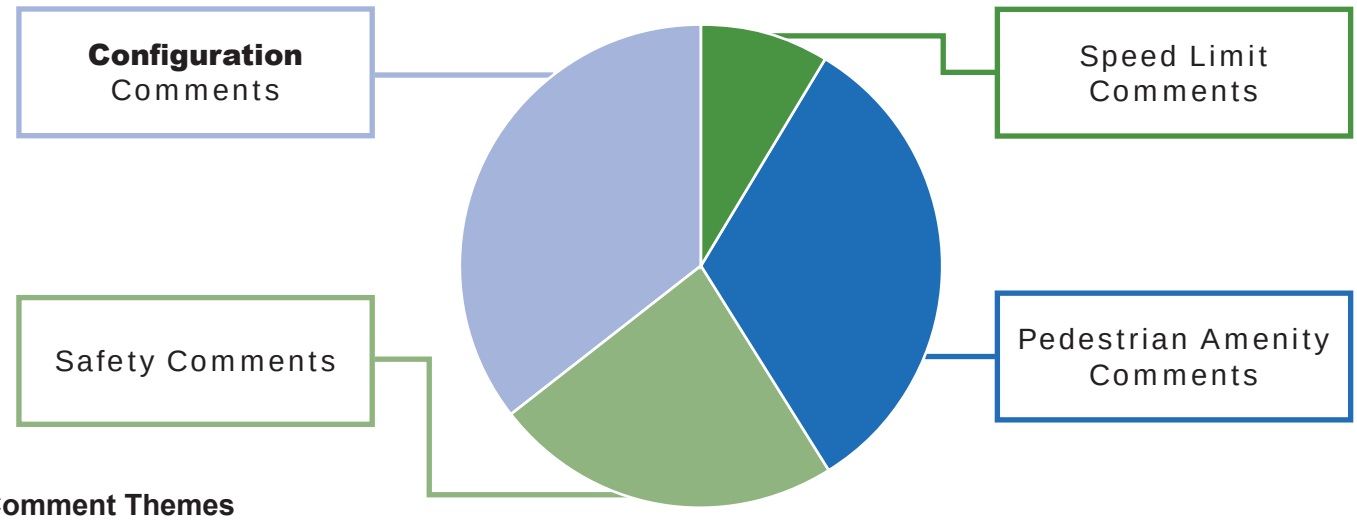
- Safety hazard - people on bikes not stoping at intersection of Dresden Ave and Lincoln Pkwy.
- Add a crosswalk from Viking Terrace to the Dairy Queen across the street

Lincoln Parkway Traffic Analysis

City Of Northfield Minnesota

June Open House

The first Lincoln Parkway Traffic Analysis open house was held on Thursday, July 20 from 5:30 - 7:30pm at the Emmaus Church in Northfield, MN and approximately 53 people attended. Attendees were able to provide feedback through speaking with project team members, reviewing educational materials, and leaving comments.



Comment Themes

Speed Limit

- Interest in reducing speed limit
- Suggest reducing speed limit to 20 MPH all day

Pedestrian Amenities

- Suggest bike lanes be separated from the roadway
- Suggest raised pedestrian crossings and pedestrian activated crossings

Safety

- Linden St N intersection is a major safety concern
- Suggest removing street parking to increase lane size and allow for better visibility

Configuration

- Suggest turn restrictions on new development road during school release time
- Suggest frontage road for school drop off and pick up
- Suggest 4-way stops or roundabouts at problematic intersections

Lincoln Parkway Traffic Analysis

City Of Northfield Minnesota

PUBLIC ENGAGEMENT SUMMARY

Phase 2 | September 2023 – January 2024

Project Background

The Lincoln Parkway Traffic Impact Analysis is intended to understand the effectiveness of the short-term improvement measures completed in 2021, develop future options and recommendations for Lincoln Parkway to increase multimodal connections and safety, and determine multimodal network improvements for safe routes to school.

Engagement by the Numbers

33
Open House Attendees

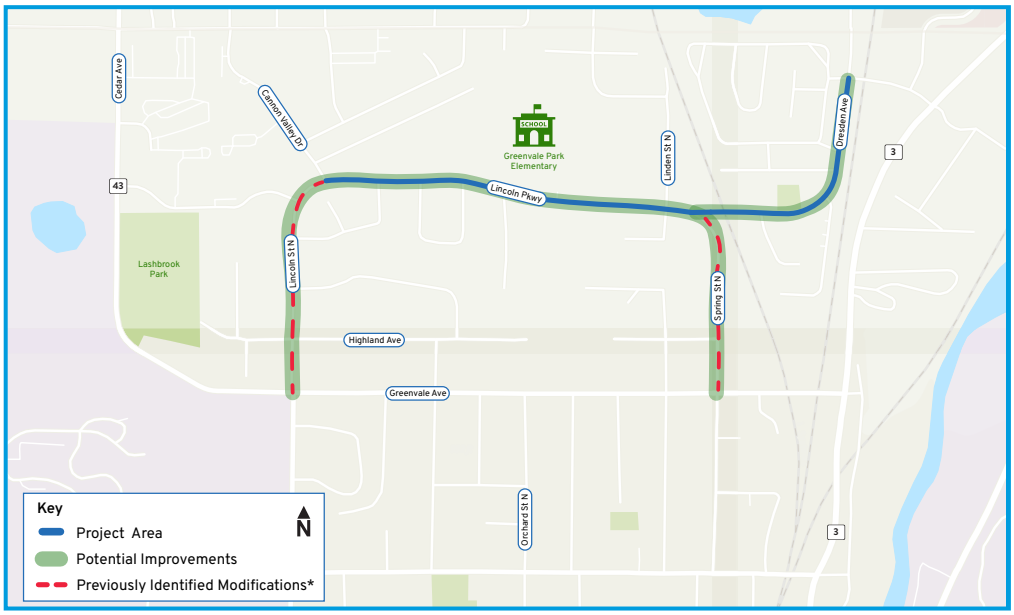
693
INPUTiD Interactions

***Includes comments, responses, likes, and dislikes*

75
Comments Received – Open House

126
Website Views

Study Area



Engagement Strategy

The project team used a combination of digital and in-person engagement tools to reach the community where they are and learn more about their experiences in the study area. The Phase 2 Open House was held on November 30, 2023.

The digital engagement tools include a project website, social media posts, and an INPUTiD™ interactive project map. The map highlights the study area and gives community members the opportunity to identify concerns, ideas, and general feedback by leaving comments or reacting to others' comments. The project website also has the option to subscribe to email or text project updates.

Engagement Goals

- Understand and document perceived problems
- Collect input regarding the concerns, priorities, and preferences within the study area
- Share and discuss possible improvements
- Document a recommended or preferred alternative

Questions?

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Lincoln Parkway Traffic Analysis

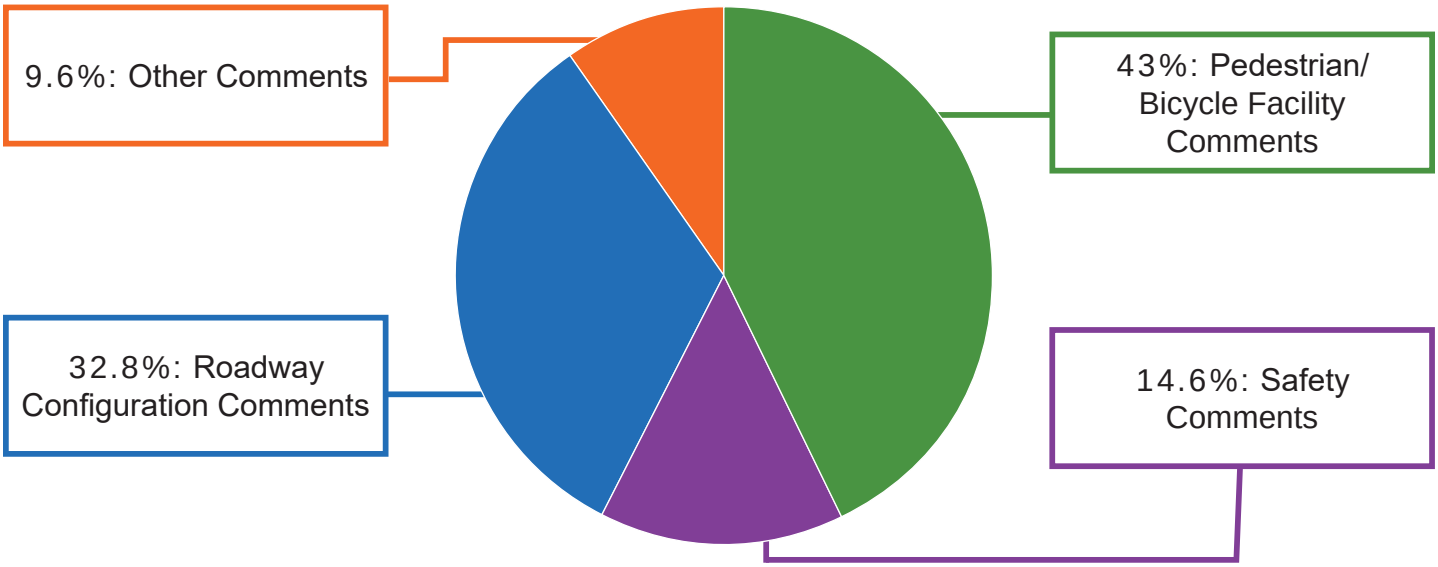
City Of Northfield Minnesota

INPUTiD Interactive Map

The INPUTiD™ interactive map provides the opportunity for residents to leave comments and react to other comments on transportation issues within the project study area. Users choose the category that closely applies to their feedback and drop comments in specific locations on the map. Comment category options are likes, dislikes, ideas/opportunities, concerns, and other feedback.

There have been 693 interactions (comments, responses, likes, and dislikes) as of January 16, 2024. The map is available in a digital format via the project website.

Comment Types



Lincoln Parkway Traffic Analysis

City Of Northfield Minnesota

Comment Themes

Pedestrian/Bicycle Facilities *(43%)***

- Some confusion about the multiple types of bike lanes in the city.
- Concerns over raised traffic levels due to narrowing roads for bike/pedestrian traffic.
- General mixed feelings about the potential addition of bike lanes.
  - Some feel they are unnecessary and will create more congestion.
  - Others appreciate the additional option for transit to the school and the separation from traffic.
- Suggestion to widen current bike path instead of adding bike lanes and change/ clarify city regulation of bikes on sidewalks.
- Concerns about the safety of crosswalks near the roundabouts.
- Dislike that adding bike lanes could impact the amount of parking near the school.
- Some desire for no curb on the bike lanes/ suggestion to narrow.

Safety *(14.6%)***

- Concerns that people will not stop for pedestrians at Cannon Valley Dr & Lincoln Pkwy.
- Additional concerns about the safety of crosswalks at roundabouts and visibility of pedestrians.
- Some appreciation that bumpouts will provide traffic calming.
- Multiple suggestions for RRFB crossings at all crosswalks near the school on Lincoln Pkwy.
- Like that there will be some narrowing near Greenvale Elementary to ease speed.
- Suggestion for pedestrian bridge from new development to Greenvale to provide safe walking to school.
- Concerns that the proposed designs will not support the additional traffic from the new development.

Roadway Configuration *(32.8%)***

- Mixed feelings about the proposed roundabouts at Lincoln Pkwy & Cannon Valley Dr and Spring St & Dresden Ave.
  - Concerns that there will be congestion during peak traffic times and that they are unwarranted for the majority of the day.
  - General worry that cars will not stop for pedestrians crossing at roundabouts.
  - Appreciate the traffic calming a roundabout provides.
- Concern that there will be a lot of congestion due to crossings directly in front of Greenvale Elementary.
- Questions about the logistics of left turns out of the elementary school and for private properties trying to cross traffic and go the opposite direction of the side of the street they are on.
- Concerns that many people do not know how to navigate roundabouts properly.
- Questioning if buses will have enough space to navigate around the proposed roundabouts.
- Suggestion to expand the school zone to further slow traffic speeds nearing the school.

Other *(9.6%)***

- Concern over the loss of trees due to construction.
- Questions regarding snow management and maintenance of the new roadway.
- Suggestion to not include parking on south side of Lincoln over concerns due to safety.
- Desire for more data about the number of bicyclists in the city.
- Concerns about potential private property impacts.
- Concerns about tax implications.

***Percentage of total comments and interactions (likes/dislikes)*

Appendix C: Bicyclist Turn Movement Checks

Bike Turning Movement Diagrams

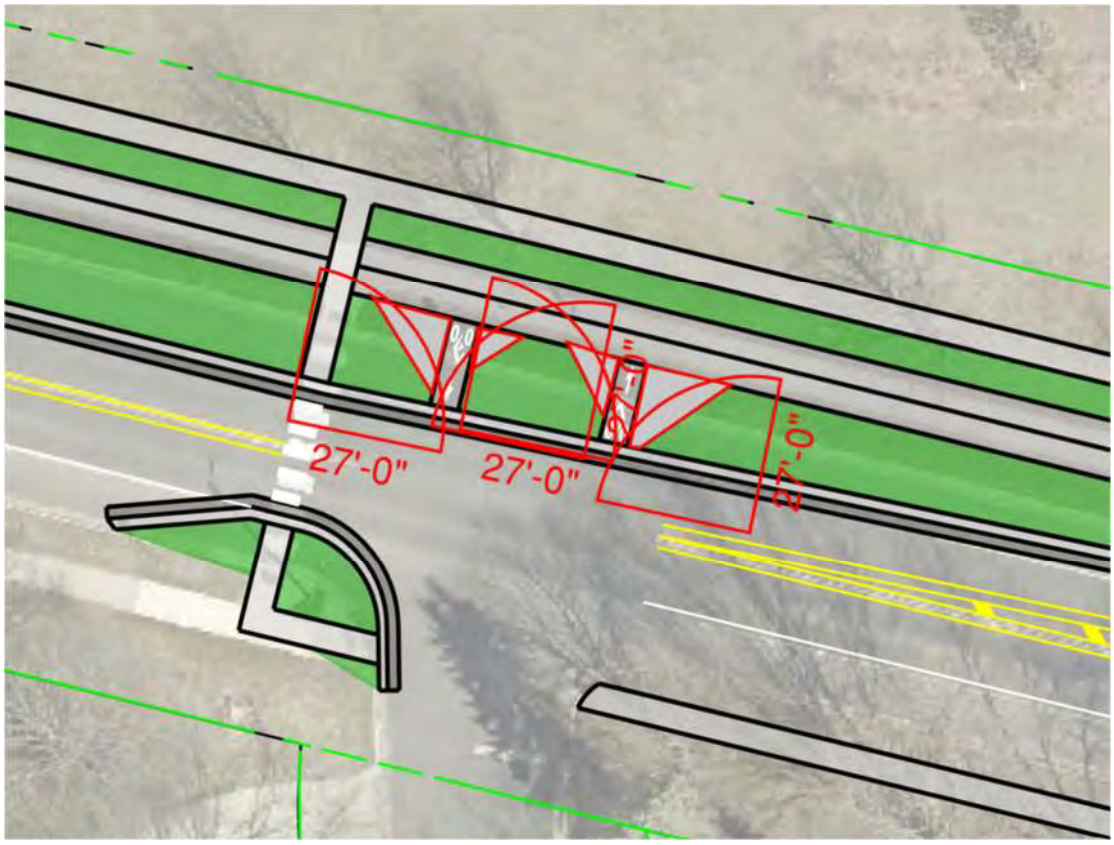
27 ft. radius for cyclists: equates to 12 mph turn

- Bicyclist movements are generally accommodated when using entire trail or bikeway and the entire crossing.
- If movements are to be accommodated within directional sides of the bikeway, trail, and/or crossing, then some minor widening could be provided (shown in the examples below as a red outline box with gray interior).
- Exact design of the bikeway, trail, and crossings to accommodate bicyclists to be determined during preliminary and final design once survey has been completed, utility locations are known, and in coordination with the ADA pedestrian design.
- Slower bicyclist speeds are recommended when encountering pedestrians or bicyclists in the opposite direction within the shared bike/pedestrian space at the crossings, but a minimum 12 mph would need to be provided for bicyclists that are unimpeded by other bicyclists or pedestrians.
- Consideration of total pedestrian and bicyclist curb ramp width will need to be taken into account during the preliminary and final design to ensure that the ramp does not have the appearance of a driveway or public street and vehicle movements onto the bikeway, trail, and sidewalk are impeded to the extent possible.

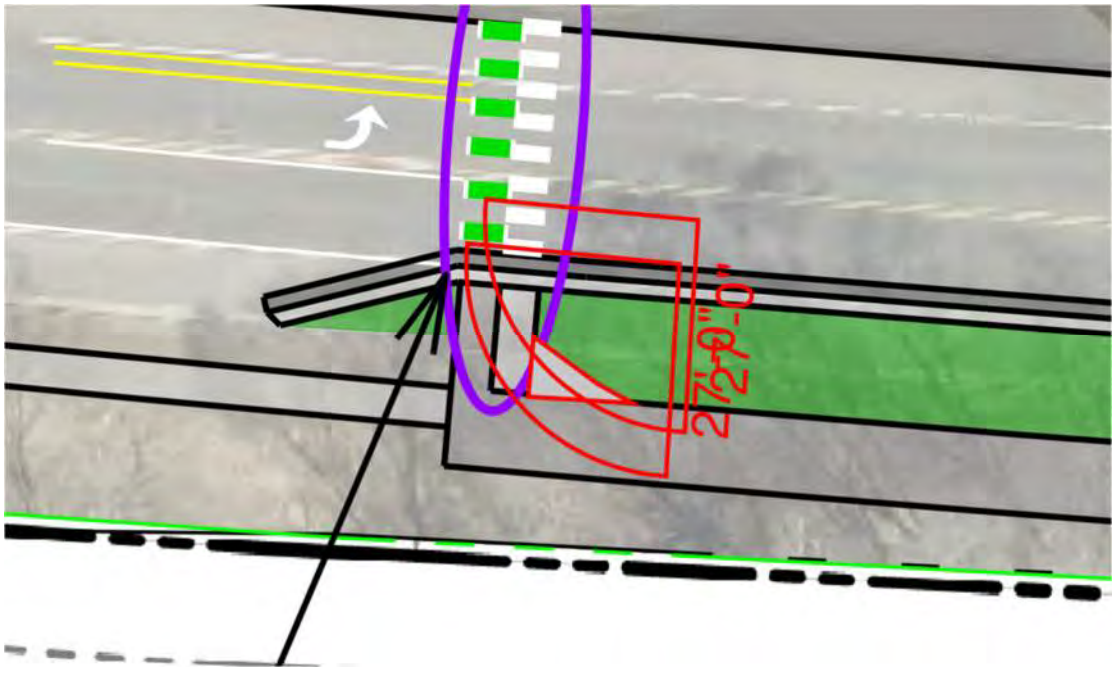
Example Locations:

Cannon Valley Drive and Lincoln Parkway, North Leg Pedestrian/Bike Crossing

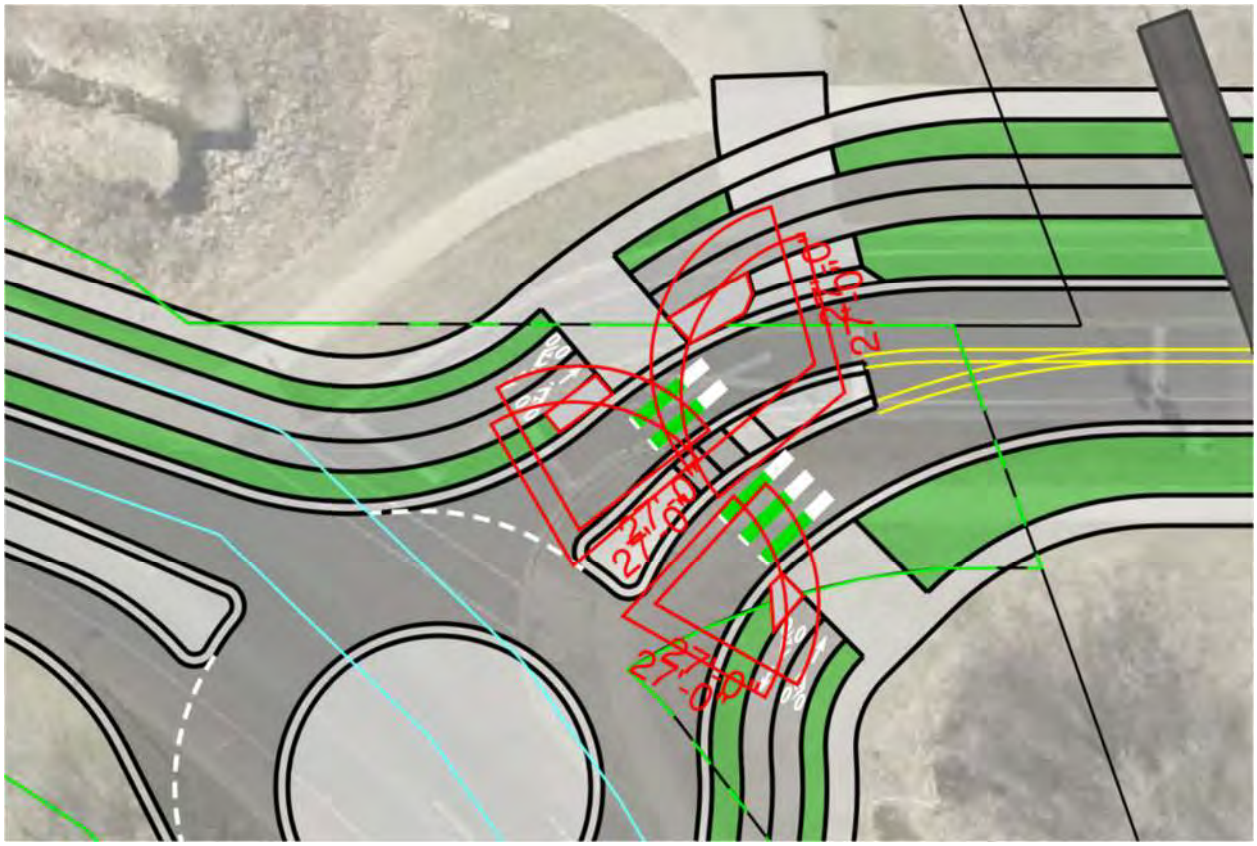
Green Meadow Court, North Side Bike Access



School Main Access Crossing, South Side



Dresden Avenue and Lincoln Parkway, East Leg Pedestrian/Bike Crossing



Appendix D: Cost Estimates

Cost Estimate Summary

Estimate	Project	2023	2028
1	school ped improvements	$ 300,000.00	$ 390,000.00
2	WB RTL	$ 280,000.00	$ 360,000.00
3	School median	$ 180,000.00	$ 230,000.00
4	Lincoln, Cannon Valley to Dresden (partial recon)	$ 2,400,000.00	$ 3,070,000.00
5	Lincoln, Cannon Valley to Dresden (full recon)	$ 3,850,000.00	$ 4,920,000.00
6	Cannon Valley Dr and Lincoln St RA	$ 1,260,000.00	$ 1,610,000.00
7	Spring St and Dresden Ave RA (as one project)	$ 2,450,000.00	$ 3,130,000.00
8	Dresden, Spring to Fremouw (partial recon)	$ 1,680,000.00	$ 2,150,000.00
9	Dresden, Spring to Fremouw (full recon)	$ 2,300,000.00	$ 2,940,000.00

Continuous Lighting Estimates (w/o RA lighting)	2023	2028
Lincoln Pkwy Continuous Lighting	$ 350,000.00	$ 450,000.00
Dresden Ave Continuous Lighting	$ 240,000.00	$ 310,000.00

Estimate	Spring and Dresden RA - Split Projects	2023	2028
7A	Lincoln Pkwy leg, NE improvements	$ 240,000.00	$ 310,000.00
7B	Dresden leg and RR, NE improvements	$ 830,000.00	$ 1,060,000.00
7C	Roundabout (west and SE)	$ 1,600,000.00	$ 2,050,000.00
7	Sum Total	$ 2,670,000.00	$ 3,420,000.00

RR Cost Information	2023	2028
Dresden RR crossing	$ 275,000.00	$ 360,000.00
Fremouw RR crossing	$ 75,000.00	$ 100,000.00

Phase	2028 Project Cost Estimates			
1	School Pedestrian Improvements	$		390,000.00
2	Lincoln Pkwy (Cannon Valley to Dresden)	$ 3,970,000.00	to	$ 6,270,000.00
3	Dresden Ave (Spring St to Fremouw)	$ 3,210,000.00	to	$ 4,310,000.00
4	Roundabouts	$		3,660,000.00
4A	Cannon RA	$		1,610,000.00
4B	Dresden RA	$		2,050,000.00

Opinion of Probable Cost - Preliminary Cost Estimate

Lincoln Pkwy Project - Curb Extensions and RRFB at School Crossing

Northfield, MN

2/14/2024

BOLTON & MENK
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Item		Unit	Total Qty	Unit Price	Total Cost
MAJOR ROADWAY ITEMS (NOTES 1-2)					
	REMOVE BITUMINOUS PAVEMENT/CONCRETE SIDEWALK	SY	560	$ 5.00	$ 2,800
	REMOVE CURB AND GUTTER	LF	270	$ 5.00	$ 1,400
	EXCAVATION - COMMON	CY	100	$ 20.00	$ 2,000
	COMMON EMBANKMENT (CV)	CY	30	$ 25.00	$ 800
	SELECT GRANULAR EMBANKMENT (CV)	CY	90	$ 25.00	$ 2,300
	TYPE SP 12.5 WEARING COURSE MIX (4,F)	TONS	90	$ 97.00	$ 8,800
	CURB AND GUTTER B424	LF	270	$ 50.00	$ 13,500
	4" CONCRETE WALK	SF	3,300	$ 9.00	$ 29,700
	TYPE SP 9.5 WEARING COURSE MIX (4,F)	TONS	50	$ 102.00	$ 5,100
	Subtotal				$ 61,000
	All Roadway Construction Subtotal				**$ 61,000**
SPECIAL LUMP SUM CONSTRUCTION ITEMS					
	RRFB AND LIGHTING	LS	1	$ 116,000.00	$ 116,000
	CITY UTILITIES (WATERMAIN/SANITARY/ELECTRIC)	LS		$ -	$ -
	Subtotal				$ 116,000
PERCENTAGE ITEMS					
	MOBILIZATION	5%		of all roadway	$ 8,900
	MISC REMOVALS (CURB, SIGNS, TREES, ETC.)	2%		of all roadway	$ 3,600
	SIGNING & PAVEMENT MARKINGS	3%		of all roadway	$ 5,400
	TURF ESTABLISHMENT AND EROSION CONTROL	5%		of all roadway	$ 8,900
	LANDSCAPING/STREETSCAPE	3%		of all roadway	$ 4,500
	TRAFFIC CONTROL/STAGING	5%		of all roadway	$ 8,900
	CONTINGENCY FOR MISSING ITEMS	20%		of all roadway	$ 35,400
	Subtotal				$ 76,000
				Construction Cost (2023 Dollars)	$ 250,000
				Anticipated Right-of-Way Cost (2023 Dollars)	$ -
				Engineering Cost (2023 Dollars)	$ 50,000
				Total Cost (2023 Dollars)	**$ 300,000**

Notes:

1. Local road pavement section assumed is 7 inch bituminous pavement,6 inch aggregate base, and 22 inch sand.
2. Trail pavement section assumed is 3 inch bituminous pavement and 4 inch aggregate base

Opinion of Probable Cost - Preliminary Cost Estimate

Lincoln Pkwy Project - Westbound Right Turn Lane At School Access

Northfield, MN

2/12/2024

BOLTON & MENK
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	Item	Unit	Total Qty	Unit Price	Total Cost
MAJOR ROADWAY ITEMS (NOTES 1-2)					
	REMOVE BITUMINOUS PAVEMENT	SY	920	$ 5.00	$ 4,600
	REMOVE CURB AND GUTTER	LF	660	$ 5.00	$ 3,300
	EXCAVATION - COMMON	CY	1,030	$ 20.00	$ 20,600
	COMMON EMBANKMENT (CV)	CY	90	$ 25.00	$ 2,300
	AGGREGATE BASE (CV) CLASS 5	CY	160	$ 45.00	$ 7,200
	SELECT GRANULAR EMBANKMENT (CV)	CY	580	$ 25.00	$ 14,500
	TYPE SP 12.5 WEARING COURSE MIX (4,F)	TONS	400	$ 97.00	$ 38,800
	CURB AND GUTTER B424	LF	740	$ 50.00	$ 37,000
	Subtotal				$ 128,000
	All Roadway Construction Subtotal				**$ 128,000**
SPECIAL LUMP SUM CONSTRUCTION ITEMS					
(4)	URBAN DRAINAGE	LS	1	$ 30,000.00	$ 30,000
	Subtotal				$ 30,000
PERCENTAGE ITEMS					
	MOBILIZATION	5%		of all roadway	$ 7,900
	MISC REMOVALS (CURB, SIGNS, TREES, ETC.)	2%		of all roadway	$ 3,200
	SIGNING & PAVEMENT MARKINGS	3%		of all roadway	$ 4,800
	TURF ESTABLISHMENT AND EROSION CONTROL	5%		of all roadway	$ 7,900
	LANDSCAPING/STREETSCAPE	3%		of all roadway	$ 4,000
	TRAFFIC CONTROL/STAGING	5%		of all roadway	$ 7,900
	CONTINGENCY FOR MISSING ITEMS	20%		of all roadway	$ 31,600
	Subtotal				$ 67,000
				Construction Cost (2023 Dollars)	$ 230,000
				Anticipated Right-of-Way Cost (2023 Dollars)	$ -
				Engineering Cost (2023 Dollars)	$ 50,000
				Total Cost (2023 Dollars)	**$ 280,000**

Notes:

1. Local road pavement section assumed is 7 inch bituminous pavement,6 inch aggregate base, and 22 inch sand.

4. Storm sewer cost is 20% of roadway construction cost

Opinion of Probable Cost - Preliminary Cost Estimate

Lincoln Pkwy Project - School Access Median

Northfield, MN

2/12/2024

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	Item	Unit	Total Qty	Unit Price	Total Cost
MAJOR ROADWAY ITEMS (NOTES 1-2)					
	REMOVE BITUMINOUS PAVEMENT	SY	240	$ 5.00	$ 1,200
	REMOVE CURB AND GUTTER	LF	180	$ 5.00	$ 900
	EXCAVATION - COMMON	CY	390	$ 20.00	$ 7,800
	COMMON EMBANKMENT (CV)	CY	30	$ 25.00	$ 800
	AGGREGATE BASE (CV) CLASS 5	CY	110	$ 45.00	$ 5,000
	SELECT GRANULAR EMBANKMENT (CV)	CY	260	$ 25.00	$ 6,500
	TYPE SP 12.5 WEARING COURSE MIX (4,F)	TONS	150	$ 97.00	$ 14,600
	CURB AND GUTTER B424	LF	280	$ 50.00	$ 14,000
	4" CONCRETE WALK	SF	3,620	$ 9.00	$ 32,600
	Subtotal				$ 83,000
	All Roadway Construction Subtotal				**$ 83,000**
SPECIAL LUMP SUM CONSTRUCTION ITEMS					
	CITY UTILITIES (WATERMAIN/SANITARY/ELECTRIC)	LS		$ -	$ -
(4)	URBAN DRAINAGE	LS	1	$ 20,000.00	$ 20,000
	Subtotal				$ 20,000
PERCENTAGE ITEMS					
	MOBILIZATION	5%		of all roadway	$ 5,200
	MISC REMOVALS (CURB, SIGNS, TREES, ETC.)	2%		of all roadway	$ 2,100
	SIGNING & PAVEMENT MARKINGS	3%		of all roadway	$ 3,100
	TURF ESTABLISHMENT AND EROSION CONTROL	5%		of all roadway	$ 5,200
	LANDSCAPING/STREETSCAPE	3%		of all roadway	$ 2,600
	TRAFFIC CONTROL/STAGING	5%		of all roadway	$ 5,200
	CONTINGENCY FOR MISSING ITEMS	20%		of all roadway	$ 20,600
	Subtotal				$ 44,000
				Construction Cost (2023 Dollars)	$ 150,000
				Anticipated Right-of-Way Cost (2023 Dollars)	$ -
				Engineering Cost (2023 Dollars)	$ 30,000
				Total Cost (2023 Dollars)	**$ 180,000**

Notes:

1. Local road pavement section assumed is 7 inch bituminous pavement,6 inch aggregate base, and 22 inch sand.

4. Storm sewer cost is 20% of roadway construction cost

Opinion of Probable Cost - Preliminary Cost Estimate

Lincoln Pkwy Project - Cannon Valley Dr to Dresden Ave Partial Recon

Northfield, MN

2/12/2024

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	Item	Unit	Total Qty	Unit Price	Total Cost
MAJOR ROADWAY ITEMS (NOTES 1-2)					
	REMOVE BITUMINOUS PAVEMENT	SY	4,290	$ 5.00	$ 21,500
	REMOVE CONCRETE MEDIAN/SIDEWALK	SF	19,270	$ 5.00	$ 96,400
	REMOVE CURB AND GUTTER	LF	4,020	$ 5.00	$ 20,100
	MILL BITTUMINOUS SURFACE (2")	SY	7,420	$ 2.00	$ 14,900
	EXCAVATION - COMMON	CY	2,990	$ 20.00	$ 59,800
	COMMON EMBANKMENT (CV)	CY	550	$ 25.00	$ 13,800
	AGGREGATE BASE (CV) CLASS 5	CY	1,000	$ 45.00	$ 45,000
	SELECT GRANULAR EMBANKMENT (CV)	CY	1,720	$ 25.00	$ 43,000
	CONCRETE PAVEMENT 8.0"	SY	60	$ 101.00	$ 6,100
	TYPE SP 9.5 WEARING COURSE MIX (4,F)	TONS	450	$ 102.00	$ 45,900
	TYPE SP 12.5 WEARING COURSE MIX (4,F)	TONS	2,040	$ 97.00	$ 197,900
	CURB AND GUTTER B424	LF	4,550	$ 50.00	$ 227,500
	4" CONCRETE WALK	SF	19,860	$ 9.00	$ 178,800
	Subtotal				$ 971,000
	All Roadway Construction Subtotal				**$ 971,000**
SPECIAL LUMP SUM CONSTRUCTION ITEMS					
	RRFB AND LIGHTING	LS	1	$ 80,000.00	$ 80,000
(3)	LINCOLN ROADWAY LIGHTING	LS	1	$ 140,000.00	$ 140,000
(4)	URBAN DRAINAGE	LS	1	$ 190,000.00	$ 190,000
	Subtotal				$ 410,000
PERCENTAGE ITEMS					
	MOBILIZATION	5%		of all roadway	$ 69,100
	MISC REMOVALS (CURB, SIGNS, TREES, ETC.)	2%		of all roadway	$ 27,700
	SIGNING & PAVEMENT MARKINGS	3%		of all roadway	$ 41,500
	TURF ESTABLISHMENT AND EROSION CONTROL	5%		of all roadway	$ 69,100
	LANDSCAPING/STREETSCAPE	3%		of all roadway	$ 34,600
	TRAFFIC CONTROL/STAGING	5%		of all roadway	$ 69,100
	CONTINGENCY FOR MISSING ITEMS	20%		of all roadway	$ 276,200
	Subtotal				$ 587,000
				Construction Cost (2023 Dollars)	$ 2,000,000
				Anticipated Right-of-Way Cost (2023 Dollars)	$ -
				Engineering Cost (2023 Dollars)	$ 400,000
				Total Cost (2023 Dollars)	**$ 2,400,000**

Notes:

1. Local road pavement section assumed is 7 inch bituminous pavement,6 inch aggregate base, and 22 inch sand.
2. Trail pavement section assumed is 3 inch bituminous pavement and 4 inch aggregate base
3. Includes wire, conduit, source of power, base, etc. Assuming MnDOTs LED-40 foot standard poles
4. Storm sewer cost is 20% of roadway construction cost

Opinion of Probable Cost - Preliminary Cost Estimate

Lincoln Pkwy Project - Cannon Valley Dr to Dresden Ave Full Recon

Northfield, MN

2/12/2024

BOLTON & MENK
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	Item	Unit	Total Qty	Unit Price	Total Cost
MAJOR ROADWAY ITEMS (NOTES 1-2)					
	REMOVE BITUMINOUS PAVEMENT	SY	11,710	$ 5.00	$ 58,600
	REMOVE CONCRETE MEDIAN/SIDEWALK	SF	19,270	$ 5.00	$ 96,400
	REMOVE CURB AND GUTTER	LF	4,890	$ 5.00	$ 24,500
	EXCAVATION - COMMON	CY	11,080	$ 20.00	$ 221,600
	COMMON EMBANKMENT (CV)	CY	660	$ 25.00	$ 16,500
	AGGREGATE BASE (CV) CLASS 5	CY	2,240	$ 45.00	$ 100,800
	SELECT GRANULAR EMBANKMENT (CV)	CY	6,250	$ 25.00	$ 156,300
	CONCRETE PAVEMENT 8.0"	SY	60	$ 101.00	$ 6,100
	TYPE SP 9.5 WEARING COURSE MIX (4,F)	TONS	450	$ 102.00	$ 45,900
	TYPE SP 12.5 WEARING COURSE MIX (4,F)	TONS	5,160	$ 97.00	$ 500,600
	CURB AND GUTTER B424	LF	5,420	$ 50.00	$ 271,000
	4" CONCRETE WALK	SF	19,860	$ 9.00	$ 178,800
	Subtotal				$ 1,677,000
	All Roadway Construction Subtotal				**$ 1,677,000**
SPECIAL LUMP SUM CONSTRUCTION ITEMS					
	RRFB AND LIGHTING	LS	1	$ 80,000.00	$ 80,000
(3)	LINCOLN ROADWAY LIGHTING	LS	1	$ 140,000.00	$ 140,000
(4)	URBAN DRAINAGE	LS	1	$ 340,000.00	$ 340,000
	Subtotal				$ 560,000
PERCENTAGE ITEMS					
	MOBILIZATION	5%		of all roadway	$ 111,900
	MISC REMOVALS (CURB, SIGNS, TREES, ETC.)	2%		of all roadway	$ 44,800
	SIGNING & PAVEMENT MARKINGS	3%		of all roadway	$ 67,200
	TURF ESTABLISHMENT AND EROSION CONTROL	5%		of all roadway	$ 111,900
	LANDSCAPING/STREETSCAPE	3%		of all roadway	$ 56,000
	TRAFFIC CONTROL/STAGING	5%		of all roadway	$ 111,900
	CONTINGENCY FOR MISSING ITEMS	20%		of all roadway	$ 447,400
	Subtotal				$ 951,000
				Construction Cost (2023 Dollars)	$ 3,200,000
				Anticipated Right-of-Way Cost (2023 Dollars)	$ -
				Engineering Cost (2023 Dollars)	$ 650,000
				Total Cost (2023 Dollars)	**$ 3,850,000**

Notes:

1. Local road pavement section assumed is 7 inch bituminous pavement,6 inch aggregate base, and 22 inch sand.
2. Trail pavement section assumed is 3 inch bituminous pavement and 4 inch aggregate base
3. Includes wire, conduit, source of power, base, etc. Assuming MnDOTs LED-40 foot standard poles
4. Storm sewer cost is 20% of roadway construction cost

Opinion of Probable Cost - Preliminary Cost Estimate

Lincoln Pkwy Project - Cannon Valley Dr & Lincoln St Roundabout

Northfield, MN

2/12/2024

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	Item	Unit	Total Qty	Unit Price	Total Cost
MAJOR ROADWAY ITEMS (NOTES 1-2)					
	REMOVE BITUMINOUS PAVEMENT	SY	2,750	$ 5.00	$ 13,800
	REMOVE CONCRETE MEDIAN/SIDEWALK	SF	3,530	$ 5.00	$ 17,700
	REMOVE CURB AND GUTTER	LF	1,220	$ 5.00	$ 6,100
	EXCAVATION - COMMON	CY	1,900	$ 20.00	$ 38,000
	COMMON EMBANKMENT (CV)	CY	300	$ 25.00	$ 7,500
	AGGREGATE BASE (CV) CLASS 5	CY	520	$ 45.00	$ 23,400
	SELECT GRANULAR EMBANKMENT (CV)	CY	1,170	$ 25.00	$ 29,300
	CONCRETE PAVEMENT 8.0"	SY	240	$ 101.00	$ 24,300
	TYPE SP 9.5 WEARING COURSE MIX (4,F)	TONS	140	$ 102.00	$ 14,300
	TYPE SP 12.5 WEARING COURSE MIX (4,F)	TONS	730	$ 97.00	$ 70,900
	CURB AND GUTTER B424	LF	2,450	$ 50.00	$ 122,500
	4" CONCRETE WALK	SF	6,820	$ 9.00	$ 61,400
	Subtotal				$ 429,000
	All Roadway Construction Subtotal				**$ 429,000**
SPECIAL LUMP SUM CONSTRUCTION ITEMS					
(3)	ROUNDABOUT LIGHTING	LS	1	$ 120,000.00	$ 120,000
(4)	URBAN DRAINAGE	LS	1	$ 90,000.00	$ 90,000
	Subtotal				$ 210,000
PERCENTAGE ITEMS					
	MOBILIZATION	5%		of all roadway	$ 32,000
	MISC REMOVALS (CURB, SIGNS, TREES, ETC.)	2%		of all roadway	$ 12,800
	SIGNING & PAVEMENT MARKINGS	3%		of all roadway	$ 19,200
	TURF ESTABLISHMENT AND EROSION CONTROL	5%		of all roadway	$ 32,000
	LANDSCAPING/STREETSCAPE	3%		of all roadway	$ 16,000
	TRAFFIC CONTROL/STAGING	5%		of all roadway	$ 32,000
	CONTINGENCY FOR MISSING ITEMS	20%		of all roadway	$ 127,800
	Subtotal				$ 272,000
				Construction Cost (2023 Dollars)	$ 910,000
				Anticipated Right-of-Way Cost (2023 Dollars)	$ 150,000
				Engineering Cost (2023 Dollars)	$ 200,000
				Total Cost (2023 Dollars)	**$ 1,260,000**

Notes:

1. Local road pavement section assumed is 7 inch bituminous pavement,6 inch aggregate base, and 22 inch sand.
2. Trail pavement section assumed is 3 inch bituminous pavement and 4 inch aggregate base
3. Includes wire, conduit, source of power, base, etc. Assuming MnDOTs LED-40 foot standard poles
4. Storm sewer cost is 20% of roadway construction cost

Opinion of Probable Cost - Preliminary Cost Estimate

Lincoln Pkwy Project - Spring St & Dresden Ave Roundabout

Northfield, MN

2/12/2024

BOLTON & MENK
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	Item	Unit	Total Qty	Unit Price	Total Cost
MAJOR ROADWAY ITEMS (NOTES 1-2)					
	REMOVE BITUMINOUS PAVEMENT	SY	3,430	$ 5.00	$ 17,200
	REMOVE CONCRETE MEDIAN/SIDEWALK	SF	5,920	$ 5.00	$ 29,600
	REMOVE CURB AND GUTTER	LF	1,680	$ 5.00	$ 8,400
	EXCAVATION - COMMON	CY	2,800	$ 20.00	$ 56,000
	COMMON EMBANKMENT (CV)	CY	290	$ 25.00	$ 7,300
	AGGREGATE BASE (CV) CLASS 5	CY	700	$ 45.00	$ 31,500
	SELECT GRANULAR EMBANKMENT (CV)	CY	1,670	$ 25.00	$ 41,800
	CONCRETE PAVEMENT 8.0"	SY	360	$ 101.00	$ 36,400
	TYPE SP 9.5 WEARING COURSE MIX (4,F)	TONS	150	$ 102.00	$ 15,300
	TYPE SP 12.5 WEARING COURSE MIX (4,F)	TONS	1,080	$ 97.00	$ 104,800
	CURB AND GUTTER B424	LF	2,420	$ 50.00	$ 121,000
	4" CONCRETE WALK	SF	7,430	$ 9.00	$ 66,900
	Subtotal				$ 536,000
STRUCTURAL ITEMS					
	MODULAR BLOCK RETAINING WALL	SF	1,140	$ 79.00	$ 90,100
	Subtotal				$ 90,000
	All Roadway Construction Subtotal				**$ 626,000**
SPECIAL LUMP SUM CONSTRUCTION ITEMS					
	DRESDEN AVE RR CROSSING	LS	1	$ 275,000.00	$ 275,000
	CITY UTILITIES (WATERMAIN/SANITARY/ELECTRIC)	LS		$ -	$ -
(3)	ROUNDABOUT LIGHTING	LS	1	$ 120,000.00	$ 120,000
(4)	URBAN DRAINAGE	LS	1	$ 130,000.00	$ 130,000
(5)	CULVERT STEEL CASING	LS	1	$ 148,800.00	$ 148,800
	PONDS	LS			$ -
	Subtotal				$ 674,000
PERCENTAGE ITEMS					
	MOBILIZATION	5%		of all roadway	$ 65,000
	MISC REMOVALS (CURB, SIGNS, TREES, ETC.)	2%		of all roadway	$ 26,000
	SIGNING & PAVEMENT MARKINGS	3%		of all roadway	$ 39,000
	TURF ESTABLISHMENT AND EROSION CONTROL	5%		of all roadway	$ 65,000
	LANDSCAPING/STREETSCAPE	3%		of all roadway	$ 32,500
	TRAFFIC CONTROL/STAGING	5%		of all roadway	$ 65,000
	CONTINGENCY FOR MISSING ITEMS	20%		of all roadway	$ 260,000
	Subtotal				$ 553,000
				Construction Cost (2023 Dollars)	$ 1,900,000
				Anticipated Right-of-Way Cost (2023 Dollars)	$ 150,000
				Engineering Cost (2023 Dollars)	$ 400,000
				Total Cost (2023 Dollars)	**$ 2,450,000**

Notes:

1. Local road pavement section assumed is 7 inch bituminous pavement,6 inch aggregate base, and 22 inch sand.
2. Trail pavement section assumed is 3 inch bituminous pavement and 4 inch aggregate base
3. Includes wire, conduit, source of power, base, etc. Assuming MnDOTs LED-40 foot standard poles
4. Storm sewer cost is 20% of roadway construction cost
5. Casing is to protect existing culverts from proposed retaining wall.

Opinion of Probable Cost - Preliminary Cost Estimate

Lincoln Pkwy Project - Spring St & Dresden Ave Roundabout: Project 7A

Northfield, MN

2/13/2024

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	Item	Unit	Total Qty	Unit Price	Total Cost
MAJOR ROADWAY ITEMS (NOTES 1-2)					
	REMOVE BITUMINOUS PAVEMENT	SY	572	$ 5.00	$ 2,900
	REMOVE CONCRETE MEDIAN/SIDEWALK	SF	1,973	$ 5.00	$ 9,900
	REMOVE CURB AND GUTTER	LF	280	$ 5.00	$ 1,400
	EXCAVATION - COMMON	CY	467	$ 20.00	$ 9,400
	COMMON EMBANKMENT (CV)	CY	48	$ 25.00	$ 1,300
	AGGREGATE BASE (CV) CLASS 5	CY	117	$ 45.00	$ 5,300
	SELECT GRANULAR EMBANKMENT (CV)	CY	278	$ 25.00	$ 7,000
	CONCRETE PAVEMENT 8.0"	SY	120	$ 101.00	$ 12,200
	TYPE SP 9.5 WEARING COURSE MIX (4,F)	TONS	25	$ 102.00	$ 2,600
	TYPE SP 12.5 WEARING COURSE MIX (4,F)	TONS	180	$ 97.00	$ 17,500
	CURB AND GUTTER B424	LF	403	$ 50.00	$ 20,200
	4" CONCRETE WALK	SF	2,477	$ 9.00	$ 22,300
	Subtotal				$ 112,000
STRUCTURAL ITEMS					
	MODULAR BLOCK RETAINING WALL	SF		$ 79.00	$ -
	Subtotal				$ -
	All Roadway Construction Subtotal				**$ 112,000**
SPECIAL LUMP SUM CONSTRUCTION ITEMS					
	DRESDEN AVE RR CROSSING	LS		$ 275,000.00	$ -
	CITY UTILITIES (WATERMAIN/SANITARY/ELECTRIC)	LS		$ -	$ -
(3)	ROUNDABOUT LIGHTING	LS		$ 120,000.00	$ -
(4)	URBAN DRAINAGE	LS	0.17	$ 130,000.00	$ 21,667
(5)	CULVERT STEEL CASING	LS		$ 148,800.00	$ -
	PONDS	LS			$ -
	Subtotal				$ 22,000
PERCENTAGE ITEMS					
	MOBILIZATION	5%		of all roadway	$ 6,700
	MISC REMOVALS (CURB, SIGNS, TREES, ETC.)	2%		of all roadway	$ 2,700
	SIGNING & PAVEMENT MARKINGS	3%		of all roadway	$ 4,100
	TURF ESTABLISHMENT AND EROSION CONTROL	5%		of all roadway	$ 6,700
	LANDSCAPING/STREETSCAPE	3%		of all roadway	$ 3,400
	TRAFFIC CONTROL/STAGING	5%		of all roadway	$ 6,700
	CONTINGENCY FOR MISSING ITEMS	20%		of all roadway	$ 26,800
	Subtotal				$ 57,000
				Construction Cost (2023 Dollars)	$ 190,000
				Anticipated Right-of-Way Cost (2023 Dollars)	
				Engineering Cost (2023 Dollars)	$ 50,000
				Total Cost (2023 Dollars)	**$ 240,000**

Notes:

1. Local road pavement section assumed is 7 inch bituminous pavement,6 inch aggregate base, and 22 inch sand.
2. Trail pavement section assumed is 3 inch bituminous pavement and 4 inch aggregate base
3. Includes wire, conduit, source of power, base, etc. Assuming MnDOTs LED-40 foot standard poles
4. Storm sewer cost is 20% of roadway construction cost
5. Casing is to protect existing culverts from proposed retaining wall.

Opinion of Probable Cost - Preliminary Cost Estimate

Lincoln Pkwy Project - Spring St & Dresden Ave Roundabout: Project 7B

Northfield, MN

2/13/2024

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	Item	Unit	Total Qty	Unit Price	Total Cost
MAJOR ROADWAY ITEMS (NOTES 1-2)					
	REMOVE BITUMINOUS PAVEMENT	SY	572	$ 5.00	$ 2,900
	REMOVE CONCRETE MEDIAN/SIDEWALK	SF	1,973	$ 5.00	$ 9,900
	REMOVE CURB AND GUTTER	LF	280	$ 5.00	$ 1,400
	EXCAVATION - COMMON	CY	467	$ 20.00	$ 9,400
	COMMON EMBANKMENT (CV)	CY	48	$ 25.00	$ 1,300
	AGGREGATE BASE (CV) CLASS 5	CY	117	$ 45.00	$ 5,300
	SELECT GRANULAR EMBANKMENT (CV)	CY	278	$ 25.00	$ 7,000
	CONCRETE PAVEMENT 8.0"	SY	120	$ 101.00	$ 12,200
	TYPE SP 9.5 WEARING COURSE MIX (4,F)	TONS	25	$ 102.00	$ 2,600
	TYPE SP 12.5 WEARING COURSE MIX (4,F)	TONS	180	$ 97.00	$ 17,500
	CURB AND GUTTER B424	LF	403	$ 50.00	$ 20,200
	4" CONCRETE WALK	SF	2,477	$ 9.00	$ 22,300
	Subtotal				$ 112,000
STRUCTURAL ITEMS					
	MODULAR BLOCK RETAINING WALL	SF		$ 79.00	$ -
	Subtotal				$ -
	All Roadway Construction Subtotal				**$ 112,000**
SPECIAL LUMP SUM CONSTRUCTION ITEMS					
	DRESDEN AVE RR CROSSING	LS	1	$ 275,000.00	$ 275,000
	CITY UTILITIES (WATERMAIN/SANITARY/ELECTRIC)	LS		$ -	$ -
(3)	ROUNDABOUT LIGHTING	LS		$ 120,000.00	$ -
(4)	URBAN DRAINAGE	LS	0.17	$ 130,000.00	$ 21,667
(5)	CULVERT STEEL CASING	LS		$ 148,800.00	$ -
	PONDS	LS			$ -
	Subtotal				$ 297,000
PERCENTAGE ITEMS					
	MOBILIZATION	5%		of all roadway	$ 20,500
	MISC REMOVALS (CURB, SIGNS, TREES, ETC.)	2%		of all roadway	$ 8,200
	SIGNING & PAVEMENT MARKINGS	3%		of all roadway	$ 12,300
	TURF ESTABLISHMENT AND EROSION CONTROL	5%		of all roadway	$ 20,500
	LANDSCAPING/STREETSCAPE	3%		of all roadway	$ 10,300
	TRAFFIC CONTROL/STAGING	5%		of all roadway	$ 20,500
	CONTINGENCY FOR MISSING ITEMS	20%		of all roadway	$ 81,800
	Subtotal				$ 174,000
				Construction Cost (2023 Dollars)	$ 580,000
				Anticipated Right-of-Way Cost (2023 Dollars)	$ 150,000
				Engineering Cost (2023 Dollars)	$ 100,000
				Total Cost (2023 Dollars)	**$ 830,000**

Notes:

1. Local road pavement section assumed is 7 inch bituminous pavement,6 inch aggregate base, and 22 inch sand.
2. Trail pavement section assumed is 3 inch bituminous pavement and 4 inch aggregate base
3. Includes wire, conduit, source of power, base, etc. Assuming MnDOTs LED-40 foot standard poles
4. Storm sewer cost is 20% of roadway construction cost
5. Casing is to protect existing culverts from proposed retaining wall.

Opinion of Probable Cost - Preliminary Cost Estimate

Lincoln Pkwy Project - Spring St & Dresden Ave Roundabout: Project 7C

Northfield, MN

2/13/2024

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	Item	Unit	Total Qty	Unit Price	Total Cost
MAJOR ROADWAY ITEMS (NOTES 1-2)					
	REMOVE BITUMINOUS PAVEMENT	SY	2,287	$ 5.00	$ 11,500
	REMOVE CONCRETE MEDIAN/SIDEWALK	SF	1,973	$ 5.00	$ 9,900
	REMOVE CURB AND GUTTER	LF	1,120	$ 5.00	$ 5,600
	EXCAVATION - COMMON	CY	1,867	$ 20.00	$ 37,400
	COMMON EMBANKMENT (CV)	CY	193	$ 25.00	$ 4,900
	AGGREGATE BASE (CV) CLASS 5	CY	467	$ 45.00	$ 21,000
	SELECT GRANULAR EMBANKMENT (CV)	CY	1,113	$ 25.00	$ 27,900
	CONCRETE PAVEMENT 8.0"	SY	120	$ 101.00	$ 12,200
	TYPE SP 9.5 WEARING COURSE MIX (4,F)	TONS	100	$ 102.00	$ 10,200
	TYPE SP 12.5 WEARING COURSE MIX (4,F)	TONS	720	$ 97.00	$ 69,900
	CURB AND GUTTER B424	LF	1,613	$ 50.00	$ 80,700
	4" CONCRETE WALK	SF	2,477	$ 9.00	$ 22,300
	Subtotal				$ 314,000
STRUCTURAL ITEMS					
	MODULAR BLOCK RETAINING WALL	SF	1,140	$ 79.00	$ 90,100
	Subtotal				$ 90,000
	All Roadway Construction Subtotal				**$ 404,000**
SPECIAL LUMP SUM CONSTRUCTION ITEMS					
	DRESDEN AVE RR CROSSING	LS		$ 275,000.00	$ -
	CITY UTILITIES (WATERMAIN/SANITARY/ELECTRIC)	LS		$ -	$ -
(3)	ROUNDABOUT LIGHTING	LS	1	$ 120,000.00	$ 120,000
(4)	URBAN DRAINAGE	LS	0.67	$ 130,000.00	$ 86,667
(5)	CULVERT STEEL CASING	LS	1	$ 148,800.00	$ 148,800
	PONDS	LS			$ -
	Subtotal				$ 355,000
PERCENTAGE ITEMS					
	MOBILIZATION	5%		of all roadway	$ 38,000
	MISC REMOVALS (CURB, SIGNS, TREES, ETC.)	2%		of all roadway	$ 15,200
	SIGNING & PAVEMENT MARKINGS	3%		of all roadway	$ 22,800
	TURF ESTABLISHMENT AND EROSION CONTROL	5%		of all roadway	$ 38,000
	LANDSCAPING/STREETSCAPE	3%		of all roadway	$ 19,000
	TRAFFIC CONTROL/STAGING	5%		of all roadway	$ 38,000
	CONTINGENCY FOR MISSING ITEMS	20%		of all roadway	$ 151,800
	Subtotal				$ 323,000
				Construction Cost (2023 Dollars)	$ 1,100,000
				Revisions to Previous Work	$ 250,000
				Anticipated Right-of-Way Cost (2023 Dollars)	
				Engineering Cost (2023 Dollars)	$ 250,000
				Total Cost (2023 Dollars)	**$ 1,600,000**

Notes:

1. Local road pavement section assumed is 7 inch bituminous pavement,6 inch aggregate base, and 22 inch sand.
2. Trail pavement section assumed is 3 inch bituminous pavement and 4 inch aggregate base
3. Includes wire, conduit, source of power, base, etc. Assuming MnDOTs LED-40 foot standard poles
4. Storm sewer cost is 20% of roadway construction cost
5. Casing is to protect existing culverts from proposed retaining wall.

Opinion of Probable Cost - Preliminary Cost Estimate

Lincoln Pkwy Project - Spring St to Fremouw Ave Partial Recon

Northfield, MN

2/12/2024

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	Item	Unit	Total Qty	Unit Price	Total Cost
MAJOR ROADWAY ITEMS (NOTES 1-2)					
	REMOVE BITUMINOUS PAVEMENT	SY	4,960	$ 5.00	$ 24,800
	REMOVE CONCRETE MEDIAN	SF	13,750	$ 5.00	$ 68,800
	REMOVE CURB AND GUTTER	LF	2,990	$ 5.00	$ 15,000
	MILL BITTUMINOUS SURFACE (2")	SY	2,830	$ 2.00	$ 5,700
	EXCAVATION - COMMON	CY	2,760	$ 20.00	$ 55,200
	COMMON EMBANKMENT (CV)	CY	410	$ 25.00	$ 10,300
	AGGREGATE BASE (CV) CLASS 5	CY	800	$ 45.00	$ 36,000
	SELECT GRANULAR EMBANKMENT (CV)	CY	1,550	$ 25.00	$ 38,800
	CONCRETE PAVEMENT 8.0"	SY	50	$ 101.00	$ 5,100
	TYPE SP 9.5 WEARING COURSE MIX (4,F)	TONS	380	$ 102.00	$ 38,800
	TYPE SP 12.5 WEARING COURSE MIX (4,F)	TONS	1,400	$ 97.00	$ 135,800
	CURB AND GUTTER B424	LF	2,530	$ 50.00	$ 126,500
	4" CONCRETE WALK	SF	11,020	$ 9.00	$ 99,200
	Subtotal				$ 660,000
	All Roadway Construction Subtotal				**$ 660,000**
SPECIAL LUMP SUM CONSTRUCTION ITEMS					
	FREMOUW TRAIL RR CROSSING	LS	1	$ 75,000.00	$ 75,000
	RELOCATE BUS SHELTER	LS	1	$ 15,000.00	$ 15,000
(3)	DRESDEN ROADWAY LIGHTING	LS	1	$ 100,000.00	$ 100,000
(4)	URBAN DRAINAGE	LS	1	$ 130,000.00	$ 130,000
	Subtotal				$ 320,000
PERCENTAGE ITEMS					
	MOBILIZATION	5%		of all roadway	$ 49,000
	MISC REMOVALS (CURB, SIGNS, TREES, ETC.)	2%		of all roadway	$ 19,600
	SIGNING & PAVEMENT MARKINGS	3%		of all roadway	$ 29,400
	TURF ESTABLISHMENT AND EROSION CONTROL	5%		of all roadway	$ 49,000
	LANDSCAPING/STREETSCAPE	3%		of all roadway	$ 24,500
	TRAFFIC CONTROL/STAGING	5%		of all roadway	$ 49,000
	CONTINGENCY FOR MISSING ITEMS	20%		of all roadway	$ 196,000
	Subtotal				$ 417,000
				Construction Cost (2023 Dollars)	$ 1,400,000
				Anticipated Right-of-Way Cost (2023 Dollars)	$ -
				Engineering Cost (2023 Dollars)	$ 280,000
				Total Cost (2023 Dollars)	**$ 1,680,000**

Notes:

1. Local road pavement section assumed is 7 inch bituminous pavement,6 inch aggregate base, and 22 inch sand.
2. Trail pavement section assumed is 3 inch bituminous pavement and 4 inch aggregate base
3. Includes wire, conduit, source of power, base, etc. Assuming MnDOTs LED-40 foot standard poles
4. Storm sewer cost is 20% of roadway construction cost

Opinion of Probable Cost - Preliminary Cost Estimate

Lincoln Pkwy Project - Spring St to Fremouw Ave Full Recon

Northfield, MN

2/12/2024

BOLTON & MENK
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	Item	Unit	Total Qty	Unit Price	Total Cost
MAJOR ROADWAY ITEMS (NOTES 1-2)					
	REMOVE BITUMINOUS PAVEMENT	SY	7,800	$ 5.00	$ 39,000
	REMOVE CONCRETE MEDIAN	SF	13,750	$ 5.00	$ 68,800
	REMOVE CURB AND GUTTER	LF	3,460	$ 5.00	$ 17,300
	EXCAVATION - COMMON	CY	5,850	$ 20.00	$ 117,000
	COMMON EMBANKMENT (CV)	CY	560	$ 25.00	$ 14,000
	AGGREGATE BASE (CV) CLASS 5	CY	1,270	$ 45.00	$ 57,200
	SELECT GRANULAR EMBANKMENT (CV)	CY	3,280	$ 25.00	$ 82,000
	CONCRETE PAVEMENT 8.0"	SY	50	$ 101.00	$ 5,100
	TYPE SP 9.5 WEARING COURSE MIX (4,F)	TONS	380	$ 102.00	$ 38,800
	TYPE SP 12.5 WEARING COURSE MIX (4,F)	TONS	2,250	$ 97.00	$ 218,300
	CURB AND GUTTER B424	LF	3,470	$ 50.00	$ 173,500
	4" CONCRETE WALK	SF	11,020	$ 9.00	$ 99,200
	Subtotal				$ 930,000
	All Roadway Construction Subtotal				**$ 930,000**
SPECIAL LUMP SUM CONSTRUCTION ITEMS					
	FREMOUW TRAIL RR CROSSING	LS	1	$ 75,000.00	$ 75,000
	RELOCATE BUS SHELTER	LS	1	$ 15,000.00	$ 15,000
(3)	DRESDEN ROADWAY LIGHTING	LS	1	$ 100,000.00	$ 100,000
(4)	URBAN DRAINAGE	LS	1	$ 190,000.00	$ 190,000
	Subtotal				$ 380,000
PERCENTAGE ITEMS					
	MOBILIZATION	5%		of all roadway	$ 65,500
	MISC REMOVALS (CURB, SIGNS, TREES, ETC.)	2%		of all roadway	$ 26,200
	SIGNING & PAVEMENT MARKINGS	3%		of all roadway	$ 39,300
	TURF ESTABLISHMENT AND EROSION CONTROL	5%		of all roadway	$ 65,500
	LANDSCAPING/STREETSCAPE	3%		of all roadway	$ 32,800
	TRAFFIC CONTROL/STAGING	5%		of all roadway	$ 65,500
	CONTINGENCY FOR MISSING ITEMS	20%		of all roadway	$ 262,000
	Subtotal				$ 557,000
				Construction Cost (2023 Dollars)	$ 1,900,000
				Anticipated Right-of-Way Cost (2023 Dollars)	$ -
				Engineering Cost (2023 Dollars)	$ 400,000
				Total Cost (2023 Dollars)	**$ 2,300,000**

Notes:

1. Local road pavement section assumed is 7 inch bituminous pavement,6 inch aggregate base, and 22 inch sand.
2. Trail pavement section assumed is 3 inch bituminous pavement and 4 inch aggregate base
3. Includes wire, conduit, source of power, base, etc. Assuming MnDOTs LED-40 foot standard poles
4. Storm sewer cost is 20% of roadway construction cost