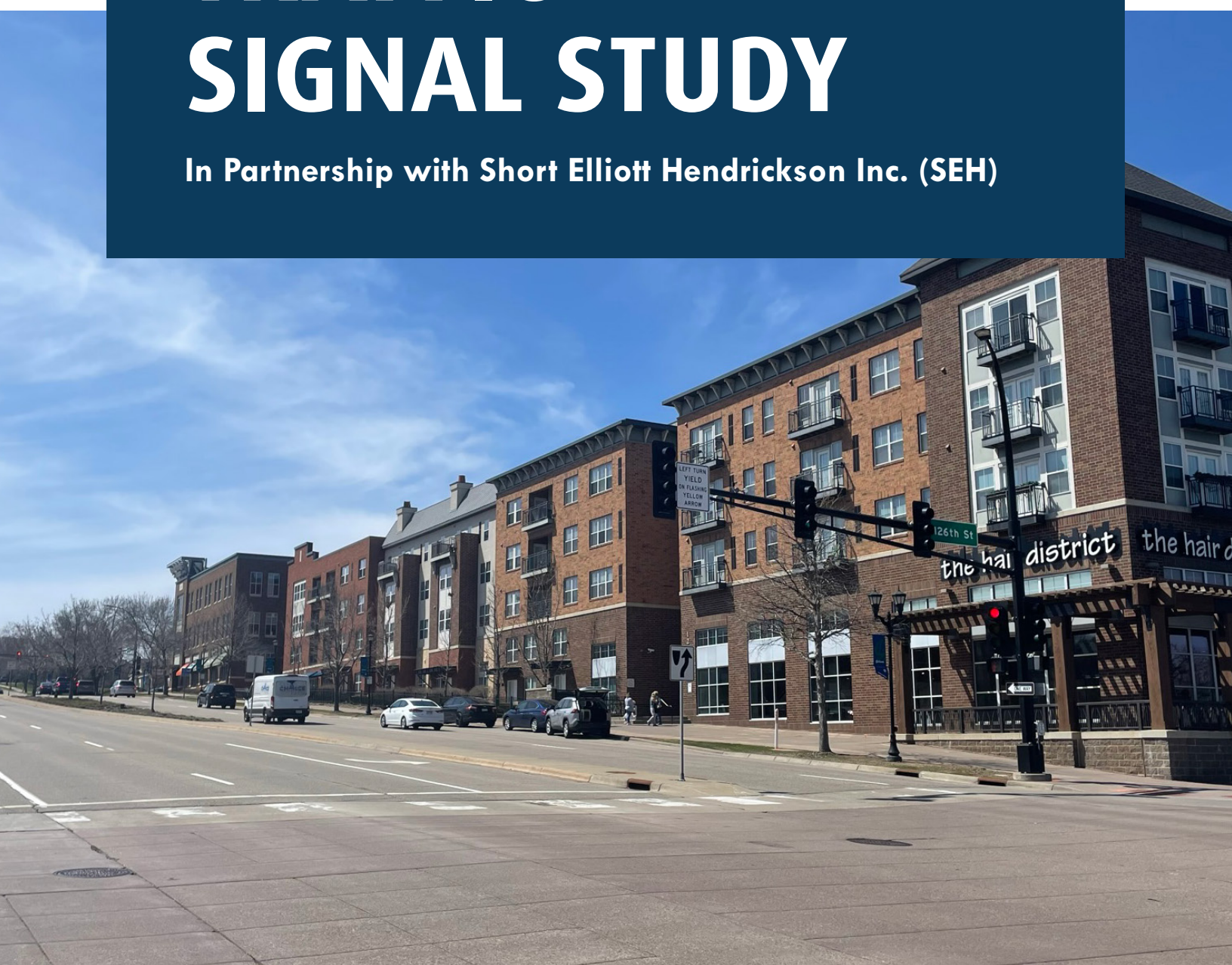
City Of Burnsville

SEH

TRAFFIC SIGNAL STUDY

In Partnership with Short Elliott Hendrickson Inc. (SEH)




Grande Market Square
2004
City Of Burnsville
Adamich Family
Ficus & Fig
Ave

TABLE OF CONTENTS


City of Burnsville
Arbor Meadows Dallas
126th St
Nicollet Ave
the hair district
th hair district

The City of Burnsville retained Short Elliott Hendrickson Inc. (SEH) to provide assistance with determining projected budgeting and planning for future traffic signal improvements throughout the City. Currently, the City has a total of 21 traffic signal systems and 14 flasher/warning systems under their jurisdiction. In addition, there are 30 Dakota County owned and operated signal systems and 18 State owned and operated signal systems within City limits that have various legs of these intersections under City jurisdiction.

- **21 signal systems** located at the intersection of 2 City streets.
- **14 flasher systems** (11 crosswalk, 2 fire station, and 1 speed sign) on City streets.
- **30 signal systems** located on County roads (not intersecting with State roadways)
- **18 signal systems** located on State trunk highways or at ramps to a freeway.


City of
Burnsville

EXECUTIVE SUMMARY

The City of Burnsville maintains 21 city-owned traffic signal systems and 14 flasher/warning systems. Additionally, there are 30 signal systems owned by Dakota County and 18 by the State of Minnesota within city boundaries that include city-maintained intersection legs.

KEY FINDINGS:

- Infrastructure Condition: Many signal systems are nearing or have exceeded their useful service life of 30–40 years. Although some intersections remain functional, components such as signal poles, cabinets, lighting, and pedestrian systems require upgrades for safety and efficiency. Staff should monitor the aged signals more closely and schedule them for replacement as actual conditions indicate the need.
- ADA & Accessibility: The City has integrated ADA and Public Right-of-Way Accessibility Guidelines (PROWAG) into its transition planning. While upgrades to curb ramps and Accessible Pedestrian Signals (APS) are not always required unless other improvements are undertaken, Burnsville is proactively including these features in all new or significantly revised signal systems.
- Countdown Timers & Flashing Yellow Arrows (FYA): Many intersections lack countdown timers and FYA capabilities. Upgrades are planned or recommended to align with MnDOT and Dakota County standards, which increasingly include FYA as a preferred configuration for permissive left turns.
- Lighting and Power Efficiency: LED street lighting is now standard on most systems, with further upgrades recommended to reduce long-term power and maintenance costs.
- Repainting & Structural Maintenance: Approximately 46 systems (city, county, state owned) will require repainting in the next 10 years, with an estimated cost of $8,000–$10,000 per intersection. The city should prioritize city-owned signals for repainting and coordinate with the county and state on repainting of shared assets.

FINANCIAL OVERVIEW:

The total estimated investment for the city between 2023 and 2032 is over $12 million, covering signal replacements, ADA ramp upgrades, painting, APS retrofits, and FYA installations. Funding for these improvements comes from a variety of sources:

- City Capital Improvement Plan (CIP) and General Fund support maintenance of city-owned signals.
- Cost-Share Agreements with Dakota County and MnDOT determine city contributions for signal legs under local jurisdiction.
- Federal and State Grants support major intersection reconstruction and ADA-compliant enhancements.
- Maintenance Agreements assign repainting or energy costs for many systems, including those owned by the County or State, to the City.

STRATEGIC RECOMMENDATIONS:

- Prioritize full replacement of signal systems older than 30 years when conditions warrant.
- Standardize traffic signal color and painting schedule.
- Continue incorporating APS, LED lighting, and countdown timers into all future improvements.
- Use interim APS installations in high pedestrian-use areas where full ADA upgrades are not yet programmed.
- Coordinate timing with County and State plans to optimize cost-sharing opportunities and prevent duplicate work.
- This study reflects Burnsville's commitment to maintaining safe, accessible, and future-ready transportation infrastructure while aligning with regional partners and complying with federal accessibility standards.

GENERAL SIGNAL MAINTENANCE NEEDS: ESTIMATED COSTS

Signal System Costs for:	Estimated Costs 2023-2027	Estimated Costs 2028-2032	Estimated Costs > 10 YRS
Replacement	$4,082,500	$2,233,333	$0
Painting	$267,000	$172,000	$25,000
Miscellaneous Items	$482,750	$482,750	$0
Curb Ramp Upgrades	$1,400,000	$1,400,000	$0
RRFB Improvements	$1,000,000	$1,000,000	$0
Estimated Costs per Period	**$7,232,250**	**$5,288,083**	**$25,000**

STANDARDS

SIGNAL SYSTEM REPLACEMENT

With regards to replacement, most agencies consider the average lifespan of a signal system to be between 30-40 years before equipment becomes obsolete and normal wear and tear have taken their toll on signal equipment. Both the County and the State typically budget for replacement of between 2-5 signal systems per year throughout their entire jurisdiction area. Signal systems with a higher number of maintenance issues are prioritized for replacement, as are locations that are well past their estimated lifespan.

From consideration of State and County typical policies and practices, we recommend that the City consider and budget for replacement of an existing signal system when that signal system reaches 30 years of age or more and shows significant wear-and-tear or is becoming trouble-some maintenance wise. Elsewhere in this report is a discussion of those locations where signal replacement is recommended to be budgeted for, both on City owned systems and also on County/State owned systems.

STANDARDS & SIGNAL EQUIPMENT

A. ADA COMPLIANCE

With regards to ADA (Americans with Disabilities Act) requirements, the Federal and Minnesota Manuals on Uniform Traffic Control Devices (MnMUTCD), and PROWAG (Public Right of Way Accessibility Guidance), existing intersections without ADA compliant pedestrian curb ramps and accessible sidewalks are not required to have these upgraded to the newer ADA standards unless other significant sidewalk and/or road work is completed at these locations. Thus, the City is not required to upgrade these facilities until further work is completed at specific locations. The State does require that each City have a written transition plan for future upgrade work at these locations so that ADA requirements are implemented throughout the City in a documented and estimated time frame.

With regards to ADA compliance of crosswalk areas, another item to consider are locations where existing median noses currently encroach into existing crosswalk areas and thus impede direct crossing of the intersection (skewed crosswalk areas). From our review and noted in our companion summary analysis of each signal system, there are several intersections where median noses encroached significantly into the crosswalk area. As part of any ADA improvement work, these median noses are strongly recommended to be pulled back to provide a straight (and as short as possible) crossing for area pedestrians.

Should the City decide to pursue upgrades in order to address ADA compliance issues with sidewalks and crosswalk areas, we have included estimated costs for bringing these items up to recommended ADA design standards. These estimated costs are included under the “Upgrade Ped Ramps” column of the “Signals-Miscellaneous Items” spreadsheet.

B. ACCESSIBLE PEDESTRIAN SYSTEMS (APS)

Work to upgrade signal systems to include the APS (Accessible Pedestrian Systems) audible pedestrian push buttons system is not required at this time. However, the State and the County have taken the policy position to incorporate the APS system into all new Trunk Highway/County Road signal systems and at signal systems that include significant revision work. State Aid is not yet requiring this modification to existing or new signal systems off of the Trunk Highway network. The City currently includes an APS system with any new signal system installations or full signal replacements (as well as with significant signal revision work) to ensure that these signal systems will be in compliance with recommended ADA and PROWAG standards. There may also be opportunities for the City to consider

interim improvements at intersections where curb ramps are not programmed or budgeted for full replacement/upgrades to ADA compliance in the next 5-10 years. On locally owned signal systems, some agencies (such as the City of Apple Valley and the Anoka County Highway Department) have proceeded with adding APS push buttons to signal systems where pedestrian usage is higher or handicapped pedestrians frequent the intersection – at these locations curb ramp upgrades are not able to be programmed for several years due to limited budget. APS push buttons are placed at locations on each quadrant to provide an accessible push button location, with only minor sidewalk removal/replacement/installation work. This work can be done for significantly less than the cost to fully upgrade an intersection to full ADA compliance and provide more accessible push button locations until full curb ramp replacement is able to be completed.

Should the City decide to pursue interim APS improvements at a signal or flasher system to improve pedestrian access to push buttons (without major intersection improvements), we have included estimated costs for completing these interim improvements. These estimated costs are included under the "Retrofit/Add APS PB (with Limited Ramp Work)" column of the "Signals-Miscellaneous Items" spreadsheet.

Note that this type of improvement may not be allowed by the County or the State on their owned and maintained signal systems without full upgrading of all curb ramps.

C. PEDESTRIAN SIGNAL INDICATIONS

In general, pedestrian signal indications (Walk/Don't Walk) do not need to be upgraded to include Countdown Timer indications until these existing indications have reached the end of their useful life (according to the MnMUTCD). Wherever possible, we recommend upgrading pedestrian signals to have the Countdown Timer indications as these have proven to be well regarded and understood by pedestrians and provide clear information to pedestrians about time available to complete crossing of an intersection approach. At this time, a total of 15 signal systems including 8 City owned signal systems do not have countdown timer pedestrian indications.

D. STREET LIGHTING ON SIGNAL SYSTEMS

The City has installed LED street lighting at all but one (1) of their City owned signal systems (Nicollet Avenue at MVTA Park & Ride). In addition, LED street lights are present on 10 of 29 County owned signal systems and on 13 of 18 State owned signal systems. The City may wish to consider retrofitting street lights on 22 of these signal systems (not including 2 County signals that are deemed imminent for full signal replacement) to utilize the LED technology and significantly reduce operating and maintenance costs. LED street lights use about 80-90 percent less power than a High Pressure Sodium street light. Typical estimated cost to retrofit an existing signal system to have LED street lights is approximately $1,000 per street light (or between $2,000 and $4,000 per signal system). Currently, all new signal system installations and locations where significant signal revisions are being performed are being upgraded to have LED street lights.

Typically, street light re-lamping and overall power costs for signal systems that have at least one City street entering the intersection are the responsibility of the City via maintenance agreement. Should the City decide to pursue LED street light upgrades at City, County, and/or State owned signal systems, we have included estimated costs for completing these improvements. These estimated costs are included under the "Upgrade to LED Street Lights" column of the "Signals-Miscellaneous Items" spreadsheet.

E. FLASHING YELLOW ARROW OPERATION

With regards to the use of flashing yellow arrow left turn phasing, the State and the County are recommending that any new signal system with protected or protected/permissive left turn phasing include the flashing yellow arrow operation. Implementing this operation for existing signal systems is currently being done widely by the State and the County (including by the County in 2022 on all signal systems along CSAH 38-McAndrews Road and at CSAH 11/137th Street). Note that none of the standard signal guidelines require the use of this operation – however this has become the standard for signal design by the County and the State on all new and significantly revised signal systems. We recommend including the use of the flashing yellow arrow operation for any new, replaced, or significantly revised signal system where the controller and controller cabinet are being upgraded or replaced as part of that work.

For existing signal systems, we recommend consideration of this modification but note that this change in operations on an existing signal system is often an expensive endeavor. Nearly all traffic signal controller units within existing City traffic signals (that currently do not have flashing yellow arrow operations) are incapable of operating the flashing yellow arrow without upgrade to a newer controller unit. Similarly, many of these controller cabinets within the City are also too old to be able to accommodate flashing yellow arrow operation (cabinets greater than 20-25 years old are generally considered by the State and the industry as being too old for use of this operation) and would require full replacement. A typical new compatible controller unit is estimated to cost around $5,000

while a new TS-2 controller cabinet capable of operating the flashing yellow arrow is estimated to cost around $20,000. Add in additional overhead signal heads that are needed to allow for this operation, and the cost to upgrade an existing signal system to flashing yellow arrow can often exceed $40,000 to $60,000. Thus, careful consideration is needed when contemplating upgrading a signal system to have the flashing yellow arrow operation.

Should the City decide to upgrade a signal system to have flashing yellow arrow operations as a stand-alone project or with other signal system improvements, we have included estimated costs for completing these improvements. These estimated costs are included under the "Estimated FYA Upgrade" column of the "Signals-Miscellaneous Items" spreadsheet.

In our summary analysis of each existing signal system, we noted that locations that already have protected/permissive left turn phasing (left turns allowed on both a dedicated green arrow and on a permissive green ball after yielding to oncoming traffic) are not recommended to have flashing yellow arrow operations installed unless:

- There is roadway reconstruction work that impacts the signal system, or
- The City plans to convert all other signal approaches in the City that have protected/permissive left turn phasing to flashing yellow arrow operations.

This recommendation is due to the significant cost required to complete this modification. Being able to convert several locations to flashing yellow arrow operations at the same time has the benefit of cost savings by having a contractor perform the work at multiple locations (and thus limit mobilization and labor costs versus several stand-alone projects).

Note that of the 21 City owned signal systems, 7 signal systems have flashing yellow arrow operations on the major approaches. All other City owned signal systems utilize protected/permissive left turn phasing for the major approaches. Of the 28 County owned signal systems (not including the HAWK signal), 15 signal systems either have or are being upgraded to have flashing yellow arrow operations in 2022. Of the 18 State owned signal systems, 7 signal systems have flashing yellow arrow operations.

F. PAINTING

Signal systems should be considered for repainting approximately every 10-15 years in order to address peeling and rusting issues and be able to keep these poles in use until the end of the overall signal system lifespan. At this time, 24 of the 82 signal and flasher systems within the City utilize galvanized pole and thus do not require repainting. Taking into account known or obvious locations where signal replacement is either needed or programmed between 2023 and 2029, there are an estimated 46 signal and flasher systems that are recommended to be repainted in the next 10 years (including 28 systems recommended to be repainted in the next 3-5 years). The 46 signal and flasher systems recommended to be repainted include 18 City systems, 19 County systems, and 9 State systems.

Typically, painting responsibilities for all signal systems within a City (even County and State owned signal systems) generally fall on the local agency (City) to complete as part of a standard signal maintenance agreement. As painting costs have continued to rise, an option to consider when replacing signal systems (as the State and the County are currently doing) is to have the signal poles be manufactured as galvanized unpainted poles like what is in-place at the Burnhaven Drive/141st Street signal system. With painting costs at around $8,000 to $10,000 per intersection, it makes sense to consider using unpainted poles on new signal systems especially outside of the downtown "Heart of the City" area.

Should the City decide to include repainting of signal systems as part of their current budgeting, we have included estimated costs for completing these improvements. These estimated costs are included for 5 year periods between 2023-2027 and 2028-2032 on the "Signals-Painting Budget" spreadsheet.

G. SIGNING

Street name and regulatory signing attached to traffic signals throughout the City at 5 City owned and 3 County owned signal systems are older (showing significant cracking and fading) and are likely not meeting current retroreflectivity requirements. We recommend that the signing on these 8 signal systems be replaced to ensure good visibility for all motorists. Estimated costs to upgrade signing at these signal systems is included under the "Signal Sign Replace/Add" column of the "Signals-Miscellaneous Items" spreadsheet.

H. SIGNAL SERVICE CABINETS

At several City owned signal systems, the existing signal service cabinets are aged (some rusted to the point where replacement is needed in the next 1-3 years) and also do not have battery back-up capabilities. We recommend that the City consider upgrading these signal service cabinets to battery back-up ready service cabinets (like what was done recently at Burnsville Parkway-Irving Avenue) in order to ensure that service facilities are in good working order and are able to be maintained throughout the remainder of the signal system's

useful lifespan. Overall, we identified 14 City owned signal systems where this improvement is recommended. Note that this work can be completed on the existing cabinet concrete foundation so that additional concrete installation work is not required. For County and State owned signal systems, we did not review this potential improvement as any changes to County and State owned service cabinets would be done by these agencies as part of their normal maintenance work.

Should the City decide to include upgrading signal service cabinets on City owned signal systems as part of their current budgeting, we have included estimated costs for completing these improvements. These estimated costs are included under the "Service Cabinet Upgrade" column of the "Signals-Miscellaneous Items" spreadsheet.

IMPENDING WORK BY STATE & COUNTY

As part of our correspondence with MnDOT Metro District and Dakota County, we requested information regarding impending work on their signal systems within the City. This information was requested to determine both estimated City cost sharing for each City leg of an intersection as part of these impending projects, as well as to ensure that any other recommended work at these locations is not estimated twice due to work planned by these agencies.

MnDOT Metro District has the following work programmed for between 2024 and 2029:

1. Full replacement of the signal system at the Interstate 35W and County Road 42 East Ramps (signal system to northbound 35W) is being programmed to be completed in 2025. It is not anticipated that the City will have any costs for this signal replacement, as all work falls on either State or County owned approaches. However, given that this work is being programmed for completion, we recommend that the City not consider having any other work be done at this location (such as repainting this signal system).

2. Full replacement of the signal systems at the Interstate 35E and County Road 42 East and West Ramps is being programmed to be completed in 2029. It is not anticipated that the City will have any costs for these signal replacements, as all work falls on either State or County owned approaches. However, given that this work is being programmed for completion, we recommend that the City not consider having any other work be done at these locations (such as repainting these signal systems).

3. Roadway reconstruction on Interstate 35W (from the Interstate 35E split to Cliff Road) is programmed to be completed in 2024 or 2025. This work may include modifications to the existing ramp signals throughout the area including at the Burnsville Parkway East and West Ramps.

Without knowing the full scope of work proposed by the State on this project, we anticipate the City being involved in the funding costs for their share of pedestrian curb ramp upgrades, and possibly flashing yellow arrow upgrades. Thus, we estimate the following City-share work to be included as part of this project:

a. Curb ramps on 3 of the 4 corners at the Burnsville Parkway East Ramps are ADA compliant and no further work is estimated to be required at these locations. Only the northeast corner curb ramp is a candidate for upgrading. Estimated cost to upgrade the curb ramp on this quadrant (and revise the APS push button system) is $30,000. City share of this cost is estimated at around $22,500.

b. Curb ramps and APS push button placements at the Burnsville Parkway West Ramps do NOT meet current ADA requirements and thus it is estimated that all 4 quadrants will require curb ramp upgrades and APS improvements. Estimated cost to upgrade all pedestrian curb ramps to meet current ADA requirements is $125,000. Estimated cost to upgrade the APS push button system is $20,000. City share of these costs are estimated at around $110,000.

c. Neither signal system has flashing yellow arrow operations, and it is anticipated that these would be considered for 3 of the 4 intersection approaches at both signal systems (all approaches except for the north leg of both intersections due to lack of dedicated left turn lanes on these approaches). The controllers and cabinets at both signal systems are capable of accepting flashing yellow arrow operations, so work would be limited to signal head replacement and some additional cable installations. Estimated cost per intersection to add flashing yellow arrow operations is $30,000. City share of this cost would be estimated to be $22,500 (3/4 of cost due to the number of approaches that are City owned).

d. Total preliminary estimated cost for signal and ramp replacement work at these 2 signal systems (again without knowing the full scope of this project work) is around $155,000.

As this project is anticipated to proceed in the 2024 or 2025 construction season, we have included the above mentioned estimated costs under the "Upgrade Ped Ramps" and "Retrofit/ Add APS PB" columns of the "Signals-Miscellaneous Items" spreadsheet.

4. Given the age and condition of many of the State owned and maintained signal systems, it is anticipated that several of these signal systems will become candidates for replacement by the State in the next several years. Some of these system replacements (such as TH 13/Cliff Road) would not be anticipated to be costs borne by the City as these are on State/County roads only. However, there are 4 signal systems along Trunk Highway 13 (at Nicollet Avenue, Portland Avenue, Parkwood Avenue, and CSAH 11) that would be anticipated to have City cost sharing for City maintained intersection approaches. Although the State has not designated a time frame for when these signal systems might be replaced, we have estimated a time and budgeting cost for when replacement would be more likely given the age and condition of these signal systems. On our attached "Signals-Replacement Budget" spreadsheet, we have noted approximately when these signal systems would be likely to be considered for replacement and their corresponding City share costs.

Dakota County is currently designing the removal of the County Road 11/Burnsville Parkway signal system and replacement with a roundabout. As this project is ongoing and funding has likely already been identified between the County and the State, analysis and costs for work at this intersection is not included as part of our analysis.

Dakota County has also identified 10 signal systems within the City that are candidates for full replacement or removal in the next 5 years as part of the County's own Capital Improvement Program (CIP). These signal systems are as follows:

- County Road 5 at Southcross Drive
- County Road 32 at 12th Avenue
- County Road 38 at Aldrich Avenue
- County Road 38 at Portland Avenue
- County Road 42 at Southcross Drive/Summit Oaks Drive
- County Road 42 at Plymouth Avenue (note that the County Road 42 Visioning Study has also identified this signal system as a candidate for removal only)
- County Road 42 at Nicollet Avenue
- County Road 42 at Aldrich Avenue (note that the County Road 42 Visioning Study has also identified this signal system as a candidate for removal only)
- County Road 42 at Burnhaven Drive
- County Road 42 at Irving Avenue (note that the County Road 42 Visioning Study has also identified this signal system as a candidate for removal only)

For all but two of these 10 signal systems (County Road 5 at Southcross Drive and County Road 42 at Southcross Drive), significant improvements to the intersection and signal system either were completed in the past 2-3 years or are being completed in 2022. Thus, while the County is still programming full replacement at these locations, it is possible that the County may delay reconstructing these signal systems for more than 5 years due to these recent County improvements.

Typically, the County budgets for replacement of approximately 2 signal systems per year and thus the City should include those costs in their overall budgeting for the 2023-2027 budgeting period. We have identified these costs in the "Signals Replacement Budget" spreadsheet. In addition, a copy of the correspondence from the County is also attached for informational purposes.

Finally, we have included costs in the "Signals Replacement Budget" spreadsheet for anticipated County signal replacements at 3 additional locations during the 2028-2032 time period due to their age and condition. The County has not indicated when the following signal systems will be budgeted for replacement but given that these are the 3 oldest signal systems after the 10 signal systems listed above these would appear to be next in line for full replacement.

- County Road 5 at 150th Street
- County Road 38 at County Road 11 West Junction
- County Road 38 at Nicollet Boulevard

CONDITION ASSESSMENT

As part of the process to determine the condition and needs at each controlled intersection within the City, we performed a detailed field review of the 35 City systems and a more cursory field review of the 48 County/State systems in May and June 2022. Items reviewed at each signal and flasher system included but were not limited to the following:

- Overall general condition of signal components and age of each system.
- Presence of components at each signal system and intersection that meet ADA requirements for access to the signal/flasher system and intersection.
- Presence of current standard signal components (such as ADA compliant pedestrian push buttons, LED pedestrian signal indications with countdown timer indications, LED street lighting, audible pedestrian push buttons, flashing yellow arrow signal operations, etc.).
- Paint condition of signal system and the need for repainting in the near future.

- Current maintenance items that need to be addressed by the City, County, and/or State to ensure that each signal system is fully operational and in good working condition.
- Opportunities for the City to perform less invasive construction in order to enhance pedestrian facilities (i.e. adding APS push buttons to an intersection without fully reconstructing all curb ramps).

Between May 11 and June 17, 2022, Short Elliott Hendrickson Inc. (SEH) reviewed each existing traffic signal and flasher system located within the City of Burnsville in detail. This included review of all pole mounted components, controller and service cabinet components, review of the controller cabinet log book to note recent maintenance issues addressed at the intersection, cursory check on all other signal components, and review of existing curb ramps and sidewalks for current compliance with ADA standards. This included the review of the following systems located within City of Burnsville limits:

- 21 signal systems located at the intersection of 2 City streets.
- 14 flasher systems (11 crosswalk, 2 fire station, and 1 speed sign) on City streets.
- 30 signal systems located on County roads (not intersecting with State roadways)
- 18 signal systems located on State trunk highways or at ramps to a freeway.

Overall, a total of 83 signal and flasher systems were reviewed for current condition and to denote where potential improvements may be required to bring a signal/flasher system up to current design standards, address maintenance issues, and address ADA-APS requirements.

From this review and subsequent discussions with both Dakota County Transportation and MnDOT Metro District Signals, we noted the following for each location. Systems are generally listed in alphabetical order by corridor, starting with City owned systems, followed by County and State owned systems.

CITY SIGNAL SYSTEMS

1. ALDRICH AVENUE AT 141ST AVENUE/ MARKETPLACE

- Installation date – 1996 (recent modifications completed in 2015).
- Log book review – no recent issues noted.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in good condition, and repainting is recommended in 5-7 years.
- Street lights are LED.
- Curb ramps were upgraded in 2015 and appear to be meeting ADA requirements.
- Signal system has ADA compliant push buttons but does not have APS (audible) buttons.

Signal system should be able to be modified to add APS push buttons with only minor concrete work on the NE, NW, and SW quadrants (adding sidewalk behind existing walks to allow for push button station installations). The SE quadrant ramps are not well set up for adding APS push buttons and meeting APS requirements for placement, and this quadrant should be considered for revisions to the curb ramps to allow for proper APS installations. However, the SE quadrant could be made to have APS push buttons added on an interim basis to provide this system with minor modifications – deferring any major curb ramp improvements until Aldrich Avenue is reconstructed in the future. Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $25,000.

- Pedestrian indications are the standard one-section hand/ walking person indications, but do NOT have Countdown Timer indications.

These can be added to the signal system by replacing the lenses inside each pedestrian signal housing, and this is recommended to be completed by the City. Estimated cost to upgrade pedestrian signals to have Countdown Timer indication lenses is $5,000 (for 8 indications).

- Signal system does not have Flashing Yellow Arrows (FYA) for the Aldrich Avenue approaches (not needed for the side streets due to lack of dedicated left turn lanes). Protected/ permissive left turn phasing exists and allows for dedicated left turn movements so FYA operation is not critical for this signal system.

Should the City want to have FYA operations, the controller and cabinet will need to be replaced (does not have capacity to accommodate FYA operations). Mast arms are good for FYA signal head installations but additional through (RYG) signal heads are needed on these mast arms to have a separate signal head centered on each through and left turn lane. Estimated cost to upgrade this signal system to have FYA operations is $50,000 which includes replacement of the controller and cabinet.

- Signal service cabinet is the original cabinet and is recommended to be upgraded to a battery back-up ready cabinet for future flexibility. This can be accomplished using the existing cabinet concrete pad. Estimated cost to replace this cabinet is $7,500. Estimated cost to make this cabinet fully battery back-up (with batteries/inverter) including cabinet replacement is $12,000.
- Street name signs are recommended to be added facing Aldrich Avenue traffic ("141st St W"). Estimated cost to add these two signs is $2,500.

For budgeting purposes, we recommend that the City add the APS push buttons, upgrade pedestrian signals to be Countdown Timers, upgrade the signal service cabinet (without batteries), and add street name signs for 141st Street on the signal mast arms within the next 5 years. Estimated cost to complete each of these items is approximately $40,000.

Signal painting is not estimated to be needed in the next 5 years. FYA operations are also not recommended to be installed at this time given that the signal system already has dedicated left turn phasing for Aldrich Avenue – this is recommended to be completed only if there is roadway reconstruction work that impacts the signal system, or if the City is converting all other signal approaches in the City that have protected/permissive left turn phasing to FYA operations.

2. BUCK HILL ROAD AT 150TH STREET/ CRYSTAL LAKE ROAD

- Installation date – 1996 (modifications being completed in 2022).
- Log book review – no recent issues noted.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Signal system is being repainted in 2022.
- Street lights are LED.
- Curb ramps will be upgraded to meet ADA requirements in 2022.
- Signal system will have APS push buttons, flashing yellow arrow operations, and new controller cabinet installed in 2022. Pedestrian indications are being upgraded to have Countdown Timer lenses as part of the 2022 work. Overhead signs are also being replaced in 2022.
- Signal service cabinet is the original cabinet and is recommended to be upgraded to a battery back-up ready cabinet for future flexibility. This can be accomplished using the existing cabinet concrete pad. Estimated cost to replace this cabinet is $7,500. Estimated cost to make this cabinet fully battery back-up (with batteries/inverter) including cabinet replacement is $12,000.
- The existing signal pedestal pole on the southwest quadrant (which has vehicle and pedestrian signals and a push button) is recommended to be replaced in the next 3-5 years, as this pole is beginning to show significant rust. Estimated cost to replace this pole and base (on the same foundation) is $3,500.

For budgeting purposes, we recommend that the City upgrade the signal service cabinet (without batteries) and replace the existing southwest corner pedestal pole within the next 5 years. Estimated cost to complete each of these items is approximately $11,000.

No other modifications are anticipated to be required in the next 5 years at this signal system.

3. BUCK HILL ROAD AT SOUTHCROSS DRIVE

- Installation date – 1996 (modifications being completed in 2022).
- Log book review – no recent issues noted.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Signal system is being repainted in 2022.
- Street lights are LED.
- Curb ramps will be upgraded to meet ADA requirements in 2022.
- Signal system will have APS push buttons, flashing yellow arrow operations, and new controller cabinet installed in 2022. Pedestrian indications are being upgraded to have Countdown Timer lenses as part of the 2022 work. Overhead signs are also being replaced in 2022.
- Signal service cabinet is the original cabinet and is recommended to be upgraded to a battery back-up ready cabinet for future flexibility. This can be accomplished using the existing cabinet concrete pad. Estimated cost to replace this cabinet is $7,500. Estimated cost to make this cabinet fully battery back-up (with batteries/inverter) including cabinet replacement is $12,000.

For budgeting purposes, we recommend that the City upgrade the signal service cabinet (without batteries) within the next 5 years. Estimated cost to complete this item is approximately $7,500. No other modifications are anticipated to be required in the next 5 years at this signal system.

4. BURNHAVEN DRIVE AT 141ST STREET

- Installation date – 2010 (recent modifications completed in 2020).
- Log book review – no recent issues noted.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Signal system is galvanized and does not require painting.
- Street lights are LED.
- Curb ramps were installed to be ADA compliant in 2010 and are still in acceptable condition (no changes recommended to these ramps until either roadway is reconstructed in the future).
- Signal system has APS push buttons, but the City is experiencing issues with at least 3 of the 8 push buttons not talking when pushed (buttons still call the Walk signal though). City is working with Dakota County to have these buttons either repaired or replaced, and costs to complete this work are not included as part of this budgeting review.
- Signal system has flashing yellow arrow operations for the Burnhaven Drive approaches, a controller and cabinet that are fully compatible with allowing for FYA operations on all approaches, a battery back-up ready service cabinet, and Countdown Timer pedestrian indications.
- Signal system has protected/permissive left turn phasing for the 141st Street approaches. This allows for dedicated left turn movements so FYA operation is not critical for these approaches.

Should the City want to have FYA operations for the 141st Street approaches, the controller and cabinet would only require minor modifications to accommodate this operation. The westbound mast arm will require having a 5-foot extension added to center the left turn signal on the turn lane, and a RYG signal will be required to be installed on this mast arm for the through lane. For the eastbound approach, a FYA signal head can be installed on the end of the existing mast arm and a RYG signal added to this mast arm for the through lane. Estimated cost to upgrade this signal system to have FYA operations for 141st Street is $20,000.

- Existing overhead street name signs are beginning to fade and should be considered for replacement in the next 5 years. Estimated cost to remove and replace these 4 overhead street name signs is $5,000.

For budgeting purposes, we recommend that the City replace the overhead street name signs within the next 5 years. Estimated cost to complete this item is approximately $5,000.

No other modifications are anticipated to be required in the next 5 years at this signal system.

FYA operations are not recommended to be installed at this time for the 141st Street approaches given that the signal system already has dedicated left turn phasing for these approaches. This is recommended to be completed only if the City is converting all other signal approaches in the City that have protected/permissive left turn phasing to FYA operations.

5. BURNHAVEN DRIVE AT 143RD STREET

- Installation date – 1988 (recent modifications completed in 2013).
- Log book review – no recent issues noted.
- While this signal system is in good condition, it is 34 years old (typical recommended lifespan for a signal system is 30-40 years before replacement is recommended). Given the age of this signal system and the lack of several current standard signal items (i.e. battery back-up service cabinet, FYA operations, APS push buttons, ADA compliant curb ramps), the City may want to consider budgeting for full replacement of this signal system in the next 5-10 years. Note that there are higher priorities for full signal replacement in the City, and this system should be able to be safely maintained in operation for up to 10 more years. For budgeting purposes, we show this signal system as being able to be maintained until full replacement after 10 years but this would be a higher priority replacement candidate around 2033.
- Paint is in fair condition with rust and fading paint becoming more common. Repainting is recommended in 3-5 years.
- Street lights are LED.
- Curb ramps do not fully meet ADA requirements due to concerns about appropriate slopes, landing areas, and placement of truncated domes. This intersection is recommended to have curb ramps upgraded either in the next 3-5 years, as part of any impending roadway improvements on either roadway, or as part of full signal replacement. Work would include modifications to the north median nose so that this median would not block the preferred crosswalk location.
- Signal system has ADA compliant push buttons but does not have APS (audible) buttons.

If there are no plans to either fully replace this signal system or upgrade curb ramps in the next 3-5 years, this signal system could be modified in the interim to add APS push buttons with only minor concrete work on each quadrant (adding sidewalk behind existing walks to allow for push button station

installations). Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $30,000.

- Pedestrian indications are the standard one-section hand/walking person indications with Countdown Timer indications.
- Signal system does not have Flashing Yellow Arrows (FYA) for the Burnhaven Drive approaches (not needed for the side streets due to lack of dedicated left turn lanes). Protected/permissive left turn phasing exists and allows for dedicated left turn movements so FYA operation is not critical for this signal system.

Should the City want to have FYA operations, the controller and cabinet will need to be replaced (does not have capacity to accommodate FYA operations). Mast arms are good for FYA signal head installations but additional through (RYG) signal heads are needed on these mast arms to have a separate signal head centered on each through and left turn lane. Estimated cost to upgrade this signal system to have FYA operations is $50,000 which includes replacement of the controller and cabinet.

- Signal service cabinet is the original cabinet, is very rusty with the base nearly rusted through, and is recommended to be upgraded to a battery back-up ready cabinet for future flexibility within the next 1-2 years. This can be accomplished using the existing cabinet concrete pad. Estimated cost to replace this cabinet is $7,500. Estimated cost to make this cabinet fully battery back-up (with batteries and inverter) including cabinet replacement is $12,000.

For budgeting purposes, we recommend that the City add the APS push buttons, upgrade the signal service cabinet (without batteries), and repaint the signal system within the next 5 years. Estimated cost to complete each of these items is approximately $47,000 (including $10,000 to repaint the signal system).

Curb ramp modifications are recommended to be completed within the next 3-5 years to make this intersection fully ADA compliant. However, existing ramps offer reasonable access and could be maintained as is until the City completes other intersection reconstruction work on either approach or replaces the signal system. Estimated cost to upgrade all curb ramps to be fully ADA compliant (including pulling back the north median nose) is approximately $150,000.

FYA operations are also not recommended to be installed at this time given that the signal system already has dedicated left turn phasing for Burnhaven Drive – this is recommended to be completed either when the signal system is fully replaced, or if the City is converting all other signal approaches in the City that have protected/permissive left turn phasing to FYA operations.

Around 2033, another 4 signal systems will be approaching or exceeding 40 years since installation (Burnhaven/143rd Street, Burnsville Parkway/Irving Avenue, Nicollet Avenue/130th Street, and Nicollet Avenue/MVTA Park & Ride) and will need to be considered for replacement

6. BURNSVILLE PARKWAY AT PLEASANT AVENUE

- Installation date – 1998 (recent modifications completed in 2012).
- Log book review – no recent issues noted.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in good condition, and repainting is recommended in 5-7 years.
- Street lights are LED.
- Curb ramps do not fully meet ADA requirements due to concerns about appropriate slopes, landing areas, and placement of truncated domes but ramps are reasonable for pedestrian access. This intersection is recommended to have curb ramps upgraded either in the next 5-10 years, or as part of any roadway improvements on either roadway.
- Signal system has ADA compliant push buttons but does not have APS (audible) buttons.

If the City elects to delay having curb ramps upgraded at this intersection for more than 5-10 years, signal system should still be able to be modified in the interim to add APS push buttons with only minor concrete or brick paver work on each quadrant. Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $30,000.

- Pedestrian indications are the standard one-section hand/walking person indications with Countdown Timer indications.
- Signal system does not have Flashing Yellow Arrows (FYA) for the Burnsville Parkway approaches (not needed for the side streets due to lack of dedicated left turn lanes). Protected/permissive left turn phasing exists and allows for dedicated left turn movements so FYA operation is not critical for this signal system.

Should the City want to have FYA operations, the controller and cabinet will need to be replaced (does not have capacity to accommodate FYA operations). Mast arms are good for FYA signal head installations but additional through (RYG) signal heads are needed on these mast arms to have a separate signal head centered on each through and left turn

lane. Estimated cost to upgrade this signal system to have FYA operations is $50,000 which includes replacement of the controller and cabinet.

- Signal service cabinet is the original cabinet, is very rusty with the base nearly rusted through, and is recommended to be upgraded to a battery back-up ready cabinet for future flexibility within the next 1-2 years. This can be accomplished using the existing cabinet concrete pad. Estimated cost to replace this cabinet is $7,500. Estimated cost to make this cabinet fully battery back-up (with batteries and inverter) including cabinet replacement is $12,000.

For budgeting purposes, we recommend that the City add the APS push buttons and upgrade the signal service cabinet (without batteries) within the next 5 years. Estimated cost to complete each of these items is approximately $38,000.

Curb ramp modifications are recommended to be completed within the next 5-10 years to make this intersection fully ADA compliant. However, existing ramps offer reasonable access and could be maintained as is until the City completes other intersection reconstruction work on either approach. Estimated cost to upgrade all curb ramps to be fully ADA compliant (including pulling back the east median nose) is approximately $150,000.

Signal painting is not estimated to be needed in the next 5 years. FYA operations are also not recommended to be installed at this time given that the signal system already has dedicated left turn phasing for Burnsville Parkway – this is recommended to be completed only if there is roadway reconstruction work that impacts the signal system, or if the City is converting all other signal approaches in the City that have protected/permissive left turn phasing to FYA operations.

7. BURNSVILLE PARKWAY AT IRVING AVENUE

- Installation date – 1988 (recent modifications completed in 2015 and 2020).
- Log book review – no recent issues noted.
- While this signal system is 34 years old, signal system is in good condition and should be able to be maintained and operated for at least 10 more years due to recent modifications. Paint is in fair condition (some rust and fading visible), and repainting is recommended in 3-5 years.
- Street lights are LED.
- Curb ramps were upgraded in 2015 and appear to be meeting ADA requirements.
- Signal system has ADA compliant push buttons but does not have APS (audible) buttons.

Signal system should be able to be modified to add APS push buttons with only minor concrete work on each quadrant (adding sidewalk behind existing walks to allow for push button station installations). Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $30,000.

- Pedestrian indications are the standard one-section hand/walking person indications with Countdown Timer indications.
- Signal system does not have Flashing Yellow Arrows (FYA) for the Burnsville Parkway approaches (not needed for the side streets due to lack of dedicated left turn lanes). Note that no dedicated left turn phasing exists for this signal system. While left turning movements from Burnsville Parkway onto Irving Avenue are low, we recommend that the City consider having some sort of dedicated left turn phasing added to this signal system to match the operation of all other signals within the City that have dedicated left turn lanes on the main line approaches.

Should the City want to consider upgrading this signal system to have protected/permissive left turn phasing (5-section head, which allows for left turns to be completed on both a dedicated green arrow and on a green ball), the controller and cabinet are able to accommodate this operation with only minor modifications. 5-section signal heads would be required to be installed on the end of each mast arm and also on the far left side of each approach but no other modifications are required to the mast arms facing Burnsville Parkway. Estimated cost to upgrade this signal system to have protected/permissive left turn operations is $15,000.

Should the City want to have FYA operations, the controller and cabinet will need to be replaced (does not have capacity to accommodate FYA operations). The southbound mast arm will require having a 5-foot extension added to center the left turn signal on the turn lane, and a second RYG signal will be required to be installed on this mast arm so that each through lane has a separate RYG signal head centered on the lane. For the northbound approach, a FYA signal head can be installed on the end of the existing mast arm, and a second RYG signal will be required to be installed on this mast arm so that each through lane has a separate RYG signal head centered on the lane. Estimated cost to upgrade this signal system to have FYA operations is $55,000 which includes replacement of the controller and cabinet.

- Signal service cabinet was upgraded in 2020 to be battery back-up ready and does not require and further work.

We recommend that the City consider having some sort of dedicated left turn phasing added for the Burnsville

Parkway approaches in order to have this signal system match the operation of all other signals within the City that have dedicated left turn lanes on the main line approaches. Upgrading the signal system to have protected/permissive left turn phasing would be an acceptable choice in order to limit construction costs for adding dedicated left turn phasing. Incorporating flashing yellow arrows will require that the controller and cabinet be replaced, while upgrading to protected/permissive phasing can be done using existing controller and cabinet equipment.

For budgeting purposes, we recommend that the City add the APS push buttons, upgrade the Burnsville Parkway approaches to have protected/permissive left turn phasing, and repaint this signal system within the next 5 years. Estimated cost to complete these items is approximately $55,000 (including $10,000 to repaint the signal system).

Around 2033, another 4 signal systems will be approaching or exceeding 40 years since installation (Burnhaven/143rd Street, Burnsville Parkway/Irving Avenue, Nicollet Avenue/130th Street, and Nicollet Avenue/MVTA Park & Ride) and will need to be considered for replacement

8. NICOLLET AVENUE AT RIVER RIDGE LANE/MVTA PARK AND RIDE LOT

- Installation date – 1995 (recent modifications completed in 2020).
- Log book review – no recent issues noted.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Note however that several modifications to this signal system are recommended to be completed within the next 5 years to address aged signal components and lack of ADA compliant curb ramps. Given the age of this signal system (27 years) with a typical lifespan of a signal system being estimated at 35-40 years, the City may want to consider having this signal system be fully replaced to address all needed modifications.
- Paint is in fair condition (some rust and fading visible), and repainting is recommended in 3-5 years.
- Street lights are NOT LED and are recommended to be upgraded within the next 1-2 years to save on maintenance and power costs. Estimated cost to replace 2 street light fixtures is $2,000.

Also recommended is adding street light davit arms and street lights to the northeast and southwest signal poles to provide more illumination for pedestrians and for a larger intersection with unique operations (i.e. dedicated bus lane and bus phasing). Estimated cost to add the davit arms, street light fixtures, and wiring from the service cabinet to these new street lights is $15,000.

- Curb ramps are older and do not meet ADA requirements. This intersection is recommended to have curb ramps upgraded either in the next 5 years, or as part of any impending roadway improvements on either roadway. Given the lack of pedestrian facilities on the southeast quadrant, the City could consider eliminating curb ramps and crossing to this quadrant (limiting pedestrian crossings to the west and north legs of the intersection only where there are sidewalks present). Estimated cost to upgrade curb ramps on the northeast, northwest, and southwest quadrants only is $100,000.
- Signal system has older pedestrian push buttons which are NOT ADA compliant and should be upgraded to at least an ADA compliant push button in the next 1-2 years. Estimated cost to upgrade the 6 existing push buttons to be ADA compliant at their current locations is $1,500.

If the City elects to delay having curb ramps upgraded at this intersection for more than 5-10 years, signal system could still be modified in the interim to add APS push buttons with only minor concrete work on each quadrant. Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $20,000.

- Pedestrian indications are non-standard 2-section Walk/Don't Walk word indications are recommended to be upgraded to the current standard one-section Hand/Walking Person indications (with Countdown Timers) within the next 1-2 years. Estimated cost to remove the aged pedestrian indications (and pole mounted bracketing) and install new one-section Countdown Timer pedestrian indications is $8,000.
- Signal system does not have Flashing Yellow Arrows (FYA) for the Nicollet Avenue approaches (not needed for the side streets due to split phasing and exclusive bus operations). Protected/permissive left turn phasing exists only for the northbound approach and allows for dedicated left turn movements while southbound traffic does NOT have dedicated left turn phasing. At minimum, we recommend that the City consider having protected/permissive left turn phasing added for the southbound approach to have this signal system comply with all other signals within the City that have a dedicated left turn lane on the main line approach.

Should the City want to consider upgrading this signal system to add protected/permissive left turn phasing for the southbound approach, the controller and cabinet are able to accommodate this operation with only minor modifications. A 5-section signal

head would be required to be installed on the end of the mast arm and also on the far left side of this approach, and a second RYG signal would be required to be installed so that there are separate RYG signals centered on each through lane. Estimated cost to upgrade this signal system to have protected/permissive left turn operations added for southbound traffic is $10,000.

Should the City want to have FYA operations for both northbound and southbound Nicollet Avenue, the controller and cabinet will need to be replaced (does not have capacity to accommodate FYA operations). Like with the protected/permissive option, the southbound approach would not require any mast arm modifications other than replacing the end mounted signal and adding a second RYG signal so that each through lane has a separate RYG signal head centered on the lane. For the northbound approach, a FYA signal head can be installed on the end of the existing mast arm with no other changes required to this mast arm. Estimated cost to upgrade this signal to have FYA operations is $50,000 which includes replacement of the controller and cabinet.

- Signal service cabinet is the original cabinet, is very rusty, and is recommended to be upgraded to a battery back-up ready cabinet for future flexibility within the next 1-2 years. This can be accomplished using the existing cabinet concrete pad. Estimated cost to replace this cabinet is $7,500. Estimated cost to make this cabinet fully battery back-up (with batteries and inverter) including cabinet replacement is $12,000.
- Overhead street name signing is aged (cracked and faded) and is recommended to be replaced within the next 1-2 years to maintain good visibility of these signs. Estimated cost to replace the four overhead street name signs is $5,000.

We recommend that the City consider having some sort of dedicated left turn phasing added for the southbound Nicollet Avenue approach in order to have this signal system match the operation of all other signals within the City that have dedicated left turn lanes on the main line approaches. Upgrading the signal system to have protected/permissive left turn phasing would be an acceptable choice in order to limit construction costs for adding dedicated left turn phasing. Incorporating flashing yellow arrows will require that the controller and cabinet be replaced, while upgrading to protected/permissive phasing can be done using existing controller and cabinet equipment.

For budgeting purposes, we recommend that the City upgrade street lights to be LED, add street light davits and LED street lights to the northwest and southeast corner mast arm poles, upgrade pedestrian curb ramps to be ADA compliant and add APS push buttons, upgrade pedestrian signals to be one-section Countdown Timer indications, upgrade the signal service cabinet (without batteries), add protected/permissive left turn phasing for the southbound Nicollet Avenue approach, and repaint the signal system within the next 5 years. Estimated cost to complete each of these items is approximately $178,000 (including $10,000 to repaint this signal system).

Should the City instead want to consider having this signal system be fully replaced (including curb ramp improvements) to address all recommended modifications, estimated cost to fully replace this signal system and upgrade the curb ramps is $500,000.

Around 2033, another 4 signal systems will be approaching or exceeding 40 years since installation (Burnhaven/143rd Street, Burnsville Parkway/Irving Avenue, Nicollet Avenue/130th Street, and Nicollet Avenue/MVTA Park & Ride) and will need to be considered for replacement.

9. NICOLLET AVENUE AT TRAVELERS TRAIL

- Installation date – 1987 (recent modifications completed in 2015).
- Log book review – no recent issues noted.
- While this signal system had significant upgrades in 2015 to bring much of this signal system up to current design standards, overall the system is 35 years old (typical recommended lifespan for a signal system is 30-40 years before replacement is recommended) and two of the four signal poles are showing significant rusting and aging. At minimum, we recommend that the City consider several significant modifications to this signal system to address aging infrastructure (see below). Note that portions of the existing signal system may be able to be reused as part of recommended modifications to the overall signal system.
- Paint is in good condition, and repainting is recommended in 5-7 years unless City plans to either have this signal system be replaced or just the mast arms and poles be replaced in the next 5 years.
- Street lights are LED.
- Curb ramps fully meet ADA requirements and were upgraded in 2015.
- Signal system has APS push buttons and separate free-standing APS push button stations where needed to ensure that push buttons are properly placed next to curb ramp landing areas.
- Pedestrian indications are the standard one-section hand/walking person indications with Countdown Timer indications.
- Signal system has Flashing Yellow Arrow left turn phasing for the Nicollet Avenue approaches (not required to be added

for the Travelers Trail approaches but recommended to be added if mast arms and poles are replaced).

- Signal service cabinet is the original cabinet and is recommended to be upgraded to a battery back-up ready cabinet for future flexibility within the next 1-2 years. This can be accomplished using the existing cabinet concrete pad. Estimated cost to replace this cabinet is $7,500. Estimated cost to make this cabinet fully battery back-up (with batteries and inverter) including cabinet replacement is $12,000.
- Mast arm pole bases on the northeast and northeast quadrants have several holes rusted through the bases. Given the age of each of the mast arms, poles, and bases, at minimum we recommend that the City budget for the full replacement of all 4 poles (complete structures) including the concrete foundations to extend the useful life of this signal system. Pole and foundation replacement would require either having the signal system be out of operation for about 4-6 weeks (and limiting access to and from Travelers Trail during that time period) or having a temporary signal system installed to maintain signal operation. Estimated cost to remove and replace the four mast arms-pole-bases and concrete foundations is $150,000. Estimated cost to have a temporary signal system installed during this reconstruction work is $75,000.
- In addition to aged signal poles, we recommend that the City consider having all underground signal cables be removed and replaced as these cables are also nearing the end of their useful life. Existing signal conduits should be able to be reused as part of the cable replacement work except for anticipated spot repairs as needed. Estimated cost to remove and replace all underground traffic signal cables is $40,000.

The existing signal system at Nicollet Avenue and Travelers Trail is 35 years old and is in need of significant modifications or full replacement soon. Much of the equipment at this signal system is in poor condition including 2 signal pole bases that have several holes rusted through these bases. There are also concerns about the condition of existing underground wiring based on past knowledge of this signal system (according to County correspondence several years ago). We recommend that the City consider full replacement of this signal system within the next few years to address aged equipment. Note that some components of this signal system (including the controller cabinet and APS push buttons) may be able to be reused as part of any full rebuild of this signal system. Estimated cost to fully replace this signal system (including likely modifications to the curb ramps and northeast island) is $500,000. Estimated cost to complete signal pole and foundation replacement, service cabinet replacement, and underground wiring replacement (with temporary signal provisions) is $273,000.

For budgeting purposes, given the age and condition of this signal system we recommend that the City have this signal system be fully replaced (potentially reusing some of the recently constructed signal equipment such as the controller cabinet) within the next 3-5 years. Estimated cost to fully replace this signal system (including some curb ramp upgrades) is $500,000.

10. NICOLLET AVENUE AT 126TH STREET

- Installation date – 2011 (modifications to be completed in 2022).
- Log book review – no recent issues noted.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in good condition, and repainting of this signal system should not be required for at least 5-7 years.
- Street lights are LED.
- Curb ramps were installed to be ADA compliant in 2010 and are still in acceptable condition (no changes recommended to be made to these ramps).
- Signal system has APS push buttons and stand-alone push button stations where needed for acceptable pedestrian access. However, the APS system is aged and may require replacement as the current Polara system is older, operational issues are occurring, and parts may be difficult to obtain. We recommend that the City consider having all 8 APS push buttons replaced (at their current locations) to ensure optimal operation of this system. Estimated cost to replace the 8 APS push buttons is $8,000.
- Signal system has flashing yellow arrow operations for the Nicollet Avenue approaches, a controller and cabinet that are fully compatible with allowing for FYA operations on all approaches, a battery back-up ready service cabinet, and Countdown Timer pedestrian indications. All signing is in good condition.

For budgeting purposes, we recommend that the City replace the APS push buttons within the next 5 years. Estimated cost to complete this item is approximately $8,000.

No other modifications are anticipated to be required in the next 5 years at this signal system.

11. NICOLLET AVENUE AT BURNSVILLE PARKWAY

- Installation date – 1973 (recent modifications completed in 2015).
- Log book review – no recent issues noted.
- While this signal system had significant upgrades in 2015 to bring much of this signal system up to current design standards, overall the system is 49 years old (typical recommended lifespan for a signal system is 30-40 years before replacement is recommended). Given the age of this signal system, we recommend that the City budget for the full replacement of this signal system within the next 5-10 years.
- Paint is in good condition, and repainting is recommended in 5-7 years unless City plans to have this signal system be replaced in the next 5-10 years. For budgeting purposes, we do not recommend having this signal system be repainted and instead budget for full signal replacement.
- Street lights are LED.
- Curb ramps fully meet ADA requirements and were upgraded in 2015.
- Signal system has APS push buttons and separate free-standing APS push button stations where needed to ensure that push buttons are properly placed next to curb ramp landing areas.
- Pedestrian indications are the standard one-section hand/walking person indications with Countdown Timer indications.
- Signal system has Flashing Yellow Arrow left turn phasing for the Nicollet Avenue approaches. Adding Flashing Yellow Arrow operation for the Burnsville Parkway approaches is not recommended to be completed until this signal system is fully replaced (due to concerns about sight distance from a significant horizontal curve to the east).
- Signal service cabinet was upgraded in 2015 to be battery back-up ready.

Beginning around 2028, the City should consider and budget for replacement of the aged signal system at Burnsville Parkway/Nicollet Avenue.

For budgeting purposes, we recommend that the City consider having this signal system be fully replaced (reusing some of the recently constructed signal equipment such as the controller cabinet and service cabinet) within the next 5-10 years. Estimated cost to fully replace this signal system (including some curb ramp upgrades) is $550,000.

12. NICOLLET AVENUE AT 130TH STREET

- Installation date – 1991 (recent modifications completed in 2015).
- Log book review – no recent issues noted.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in fair condition, and repainting is recommended in 3-5 years.
- Street lights are LED.
- Curb ramps were upgraded in 2015 and appear to be meeting ADA requirements.
- Signal system has APS push buttons and separate free-standing APS push button stations where needed to ensure that push buttons are properly placed next to curb ramp landing areas.
- Pedestrian indications are the standard one-section hand/walking person indications with Countdown Timer indications.
- Signal system does not have Flashing Yellow Arrows (FYA) for the southbound Nicollet Avenue approach. Protected/permissive left turn phasing exists and allows for dedicated left turn movements so FYA operation is not critical for this signal system.

Should the City want to have FYA operations, the controller and cabinet will need to be replaced (does not have capacity to accommodate FYA operations). The southbound mast arm is good for a FYA signal head installation but an additional through (RYG) signal head is needed on this mast arm to have a separate signal head centered on each through and left turn lane. Estimated cost to upgrade this signal system to have FYA operations is $40,000 which includes replacement of the controller and cabinet.

- Signal service cabinet is the original cabinet and is recommended to be upgraded to a battery back-up ready cabinet for future flexibility. This can be accomplished using the existing cabinet concrete pad. Estimated cost to replace this cabinet is $7,500. Estimated cost to make this cabinet fully battery back-up (with batteries/inverter) including cabinet replacement is $12,000.

For budgeting purposes, we recommend that the City upgrade the signal service cabinet (without batteries) and repaint the signal system within the next 5 years. Estimated cost to complete each of these items is approximately $16,000 (including an estimated $8,000 to repaint the signal system).

FYA operations are also not recommended to be installed at this time given that the signal system already has dedicated left turn phasing for southbound Nicollet Avenue – this is recommended to be completed only if there is roadway reconstruction work that impacts the signal system, or if the City is converting all other signal approaches in the City that have protected/permissive left turn phasing to FYA operations.

Around 2033, another 4 signal systems will be approaching or exceeding 40 years since installation (Burnhaven/143rd Street, Burnsville Parkway/Irving Avenue, Nicollet Avenue/130th Street, and Nicollet Avenue/MVTA Park & Ride) and will need to be considered for replacement

13. NICOLLET AVENUE AT 134TH STREET-WOODCREST DRIVE

- Installation date – 2015 (replaced aged signal system).
- Log book review – no recent issues noted.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in good condition and repainting is anticipated to be needed in 5-7 years.
- Street lights are LED.
- Curb ramps were installed to be ADA compliant in 2015.
- Signal system has APS push buttons and separate free-standing APS push button stations where needed to ensure that push buttons are properly placed next to curb ramp landing areas.
- Signal system has flashing yellow arrow operations for the Nicollet Avenue approaches, a controller and cabinet that are fully compatible with allowing for FYA operations on all approaches, a battery back-up ready service cabinet, and Countdown Timer pedestrian indications. All overhead signing is in good condition.

For budgeting purposes, no modifications are anticipated to be required in the next 5 years at this signal system.

14. NICOLLET AVENUE AT NICOLLET BOULEVARD

- Installation date – 1997 (minor modifications to be completed in 2022).
- Log book review – no recent issues noted.
- Signal system is in fair condition. Note however that several modifications to this signal system are recommended to be completed within the next 5 years to address aged signal components and lack of ADA compliant curb ramps. Given the age of this signal system (25 years) with a typical lifespan of a signal system being estimated at 35-40 years, the City may want to consider having this signal system be fully replaced to address all needed modifications.
- Paint is in fair condition (some rust and fading visible), and repainting is recommended in 3-5 years unless this signal system is budgeted for full replacement.
- Street lights on the northeast and southwest corner poles are LED.

If this signal system were to be maintained and revised to address other issues noted below, we recommend adding street light davit arms and street lights to the northwest and southeast signal poles to provide more illumination for pedestrians and for a larger intersection. Estimated cost to add the davit arms, street light fixtures, and wiring from the service cabinet to each new street light is $15,000.

- Curb ramps are older and do not meet ADA requirements. This intersection is recommended to have curb ramps upgraded either in the next 3-5 years, or as part of any impending roadway improvements on either roadway. Work would include modifications to the north, south and east median noses so that these do not block preferred crosswalk locations. Estimated cost to upgrade curb ramps on each quadrant and median modifications is $170,000.
- Signal system has older pedestrian push buttons (5 of the 8 push buttons are NOT ADA compliant) and these should be upgraded to at least an ADA compliant push button in the next 1-2 years. Estimated cost to upgrade 5 existing push buttons to be ADA compliant at their current locations is $1,300.

Upgrading to APS push buttons in the interim (without having curb ramps upgraded) is NOT recommended at this intersection as placement of APS push buttons would be difficult to achieve and meeting ADA and APS requirements with current geometrics is unlikely. Should curb ramps be upgraded to be ADA compliant, a full APS system installation is estimated to cost $30,000.

- Pedestrian indications are the standard one-section hand/walking person indications, but do NOT have Countdown Timer indications.

These can be added to the signal system by replacing the lenses inside each pedestrian signal housing, and this is recommended to be completed by the City. Estimated cost to upgrade pedestrian signals to have Countdown Timer indication lenses is $5,000 (for 8 indications).

- Signal system does not have Flashing Yellow Arrows (FYA) for any of the 4 approaches. Protected/permissive left turn phasing exists for each approach and allows for dedicated left turn movements.

Should the City want to have FYA operations for each intersection approach, the controller and cabinet will need to be replaced (does not have capacity to accommodate FYA operations). Several modifications to existing mast arms (including adding 5-foot extensions to each mast arm, adding a second RYG signal head to each Nicollet Avenue mast arm so that there are separate RYG signal heads centered on each

through lane, and other signal head relocation work) would be required to modify this signal system to allow for approved FYA operations. Estimated cost to upgrade this signal to have FYA operations is $70,000 which includes replacement of the controller and cabinet.

- Signal service cabinet is the original cabinet, is very rusty, and is recommended to be upgraded to a battery back-up ready cabinet for future flexibility within the next 1-2 years. This can be accomplished using the existing cabinet concrete pad. Estimated cost to replace this cabinet is $7,500. Estimated cost to make this cabinet fully battery back-up (with batteries and inverter) including cabinet replacement is $12,000.

At minimum we recommend that the City add street light davits and LED street lights to the northwest and southeast corner mast arm poles, upgrade pedestrian curb ramps to be ADA compliant and add APS push buttons, upgrade pedestrian signals to be one-section Countdown Timer indications, upgrade the signal service cabinet (without batteries), and repaint the signal system within the next 5 years. Estimated cost to complete each of these items is approximately $238,000 (including $10,000 to repaint this signal system). Upgrading to have flashing yellow arrow operations as part of these modifications would result in an estimated overall budgeted cost of $308,000.

The signal system at Nicollet Avenue and Nicollet Boulevard is in need of significant upgrades to make ADA compliant and bring up to current design standards. Given the age of this signal system (25 years old) and the number of upgrades recommended to be completed that are estimated to cost between $230,000 and $300,000, we recommend that the City budget for and have this signal system fully replaced in the next 5 years.

However, given the number of recommended modifications to the signal system along with the age of the system, our overall recommendation for budgeting is to have this signal system be fully replaced and have curb ramps upgraded to be ADA compliant for a budgeted cost of $550,000.

15. NICOLLET AVENUE AT FAIRVIEW DRIVE/COBBLESTONE COURT

- Installation date – 2003 (recent modifications completed in 2013).
- Log book review – no recent issues noted.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in fair condition, and repainting is recommended in 3-5 years.
- Street lights are LED.
- Curb ramps are original on the northwest and southwest quadrants (2003) and are NOT ADA compliant. Curb ramps on the northeast and southeast quadrants were upgraded in 2013 and appear to be meeting ADA requirements. Given the close proximity to hospital and retail developments, we recommend having the northwest and southwest curb ramps upgraded either in the next 3-5 years, or as part of any impending roadway improvements on either roadway. Estimated cost to upgrade curb ramps on the northwest and southwest quadrants is $60,000.
- Signal system has ADA compliant push buttons but does not have APS (audible) buttons.

If curb ramp improvements are not planned to be completed in the next 3-5 years, signal system should be able to be modified in the interim to add APS push buttons with only minor concrete work on all four quadrants (adding sidewalk behind existing walks to allow for push button station installations or replacing 1-2 concrete sidewalk panels on each quadrant to allow for push button station installations). Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $30,000.

- Pedestrian indications are the standard one-section hand/walking person indications with Countdown Timer indications.
- Signal system does not have Flashing Yellow Arrows (FYA) for any of the intersection approaches. Protected left turn phasing exists for each side street approach and protected/permissive left turn phasing exists for the Nicollet Avenue approaches. This allows for dedicated left turn movements so FYA operation is not critical for this signal system.

Should the City want to have FYA operations, the controller and cabinet will need to be replaced (does not have capacity to accommodate FYA operations). Mast arms are good for FYA signal head installations but an extension is needed on the westbound facing mast arm to have a separate signal head centered on each through and left turn lane. Estimated cost to upgrade this signal system to have FYA operations is $60,000 which includes replacement of the controller and cabinet.

- Signal service cabinet is the original cabinet and is recommended to be upgraded to a battery back-up ready cabinet for future flexibility. This can be accomplished using the existing cabinet concrete pad. Estimated cost to replace this cabinet is $7,500. Estimated cost to make this cabinet fully battery back-up (with batteries/inverter) including cabinet replacement is $12,000.

For budgeting purposes, we recommend that the City upgrade the curb ramps on the northwest and southwest quadrants, add the APS push buttons, upgrade the signal service cabinet (without batteries), and repaint the signal system within the next 5 years. Estimated cost to complete each of these items is approximately $108,000 (including $10,000 for repainting the signal system).

FYA operations are not recommended to be installed at this time given that the signal system already has dedicated left turn phasing for each intersection approach – this is recommended to be completed only if there is roadway reconstruction work that impacts the signal system, or if the City is converting all other signal approaches that have protected or protected/permissive left turn phasing to FYA operations.

16. SOUTHCROSS DRIVE AT BURNHAVEN DRIVE

- Installation date – 2003.
- Log book review – no recent issues noted.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in poor condition (lots of rust and fading), and repainting is recommended in 3-5 years.
- Street lights are LED.
- Curb ramps are older and do not meet ADA requirements due to steep grades and truncated dome locations. This intersection is recommended to have curb ramps upgraded either in the next 3-5 years, or as part of any impending roadway improvements on either roadway. Work would include modifications to all four median noses so that these either do not block preferred crosswalk locations or are modified to allow for compliant crossings through each median. Estimated cost to upgrade curb ramps on each quadrant and median modifications is $180,000.
- Signal system has ADA compliant push buttons but does not have APS (audible) buttons.

If curb ramp upgrades are delayed, signal system should still be able to be modified in the interim to add APS push buttons with only minor concrete work on each quadrant and in each median (adding sidewalk behind existing walks to allow for push button station installations and replacing various sidewalk or median panels to accommodate push button installations). Estimated cost to upgrade signal to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $40,000.

- Pedestrian indications are the standard one-section hand/walking person indications, but do NOT have Countdown Timer indications.

These can be added to the signal system by replacing the lenses inside each pedestrian signal housing, and this is recommended to be completed by the City. Estimated cost to upgrade pedestrian signals to have Countdown Timer indication lenses is $5,000 (for 8 indications).

- Signal system does not have Flashing Yellow Arrows (FYA) for any intersection approach. Protected/permissive left turn phasing exists on each approach and allows for dedicated left turn movements so FYA operation is not critical for this signal system.

Should the City want to have FYA operations, the controller and cabinet will need to be replaced (does not have capacity to accommodate FYA operations). Mast arms are good for FYA signal head installations but additional through (RYG) signal heads are needed on all four mast arms to have a separate signal head centered on each through and left turn lane. Estimated cost to upgrade this signal system to have FYA operations is $60,000 which includes replacement of the controller and cabinet.

- Signal service cabinet is the original cabinet and is recommended to be upgraded to a battery back-up ready cabinet for future flexibility. This can be accomplished using the existing cabinet concrete pad. Estimated cost to replace this cabinet is $7,500. Estimated cost to make this cabinet fully battery back-up (with batteries/inverter) including cabinet replacement is $12,000.
- Street name signs are faded on all approaches and are recommended to be replaced in the next 3-5 years. Estimated cost to replace the 4 overhead street name signs is $5,000.

For budgeting purposes, we recommend that the City upgrade all pedestrian curb ramps, add the APS push buttons, upgrade pedestrian signals to be Countdown Timers, upgrade the signal service cabinet (without batteries), replace all four street name signs, and repaint the signal system within the next 5 years. Estimated cost to complete each of these items is approximately $248,000 (including an estimated $10,000 for costs to repaint the signal system).

FYA operations are not recommended to be installed at this time given that the signal system already has dedicated left turn phasing for each intersection approach – this is recommended to be completed only if there is roadway reconstruction work that impacts the signal system, or if the City is converting all other signal approaches in the City that have protected/permissive left turn phasing to FYA operations.

17. SOUTHCROSS DRIVE AT GRAND AVENUE

- Installation date – 1996 (minor modifications completed in 2006).
- Log book review – no recent issues noted.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in good condition and repainting is recommended in 5-7 years.
- Street lights are LED.
- Curb ramps are older and do not meet ADA requirements due to steep grades and truncated dome locations. This intersection is recommended to have curb ramps upgraded either in the next 3-5 years, or as part of any impending roadway improvements on either roadway. Estimated cost to upgrade curb ramps on each quadrant is $125,000.
- Signal system has ADA compliant push buttons but does not have APS (audible) buttons.

If curb ramp upgrades are delayed, signal system should still be able to be modified in the interim to add APS push buttons with only minor concrete work on each quadrant (adding sidewalk behind existing walks to allow for push button station installations). Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $20,000.

- Pedestrian indications are non-standard 12-inch 1-section Hand/Walking Person indications without Countdown Timers and are recommended to be upgraded to the current standard 16-inch one-section Hand/Walking Person indications (with Countdown Timers) within the next 1-2 years. Estimated cost to remove the aged pedestrian indications (and pole mounted bracketing) and install new one-section Countdown Timer pedestrian indications is $6,000.
- Signal system does not have Flashing Yellow Arrows (FYA) for any intersection approach. Protected/permissive left turn phasing exists on each Southcross Drive approach and allows for dedicated left turn movements so FYA operation is not critical for this signal system. Note that there are no dedicated left turn lanes on Grand Avenue, and thus left turn phasing is not required for these approaches.

Should the City want to have FYA operations, the controller and cabinet will need to be replaced (does not have capacity to accommodate FYA operations). Mast arms are good for FYA signal head installations but additional through (RYG) signal heads are needed on both Southcross Drive mast arms to have a separate signal head centered on each through and left turn lane. Estimated cost to upgrade this signal system to have FYA operations is $50,000 which includes replacement of the controller and cabinet.

- Signal service cabinet is the original cabinet, has some rust, and is recommended to be upgraded to a battery back-up ready cabinet for future flexibility. This can be accomplished using the existing cabinet concrete pad. Estimated cost to replace cabinet is $7,500. Estimated cost to make this cabinet fully battery back-up (with batteries/inverter) including cabinet replacement is $12,000.
- Street name signs are faded on all approaches and are recommended to be replaced in the next 3-5 years. Estimated cost to replace the 4 overhead street name signs is $5,000.
- For budgeting purposes, we recommend that the City upgrade all pedestrian curb ramps, add the APS push buttons, upgrade pedestrian signals to be Countdown Timers, upgrade the signal service cabinet (without batteries), and replace all four street name signs within the next 5 years. Estimated cost to complete each of these items is approximately $164,000.

Repainting of the signal system should not be required in the next 5 years. FYA operations are also not recommended to be installed at this time given that the signal system already has dedicated left turn phasing for each Southcross Drive approach – this is recommended to be completed only if there is roadway reconstruction work that impacts the signal system, or if the City is converting all other signal approaches in the City that have protected/permissive left turn phasing to FYA operations.

18. SOUTHCROSS DRIVE AT PORTLAND AVENUE

- Installation date – 1997 (minor modifications completed in 2003).
- Log book review – no recent issues noted.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in good condition and repainting is recommended in 5-7 years.
- Street lights are LED.
- Curb ramps are older and do not meet ADA requirements due to steep grades and truncated dome locations. This intersection is recommended to have curb ramps upgraded either in the next 3-5 years, or as part of any impending roadway improvements on either roadway. Estimated cost to upgrade curb ramps on each quadrant is $125,000.
- Signal system has older pedestrian push buttons (3 of the 8 push buttons are NOT ADA compliant) and these should be upgraded to at least an ADA compliant push button in

the next 1-2 years. Estimated cost to upgrade 3 existing push buttons to be ADA compliant at their current locations is $800.

If curb ramp upgrades are delayed, signal system should still be able to be modified in the interim to add APS push buttons with only minor concrete work on each quadrant (adding sidewalk behind existing walks to allow for push button station installations). Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $25,000.

- Pedestrian indications are non-standard 12-inch 2-section Hand/Walking Person indications without Countdown Timers and are recommended to be upgraded to the current standard 16-inch one-section Hand/Walking Person indications (with Countdown Timers) within the next 1-2 years. Estimated cost to remove the aged pedestrian indications (and pole mounted bracketing) and install new one-section Countdown Timer pedestrian indications is $8,000.
- Signal system does not have Flashing Yellow Arrows (FYA) for any intersection approach. Protected/permissive left turn phasing exists on each Southcross Drive approach and allows for dedicated left turn movements so FYA operation is not critical for this signal system. Note that there are dedicated left turn lanes for each Portland Avenue approach, but these approaches are operated with permissive phasing and could be upgraded to have dedicated left turn phasing.

Should the City want to have FYA operations, the controller and cabinet will need to be replaced (does not have capacity to accommodate FYA operations). For Southcross Drive, mast arms are good for FYA signal head installations but additional through (RYG) signal heads are needed on both mast arms to have a separate signal head centered on each through and left turn lane. Estimated cost to upgrade this signal system to have FYA operations for Southcross Drive only is $50,000 which includes replacement of the controller and cabinet.

If either protected/permissive or FYA operations are desired for the Portland Avenue approaches, the southbound facing mast arm will be required to be replaced with a 10 foot longer mast arm and the northbound facing mast arm will need to have a 5-foot extension added so that the overhead left turn signal heads are centered on the approaching left turn lane. Other modifications to these mast arms will be required to place the RYG signals over the center of the approaching through lanes. Estimated cost to upgrade this signal system to add dedicated left turn phasing for Portland Avenue approaches is $30,000 and is in addition to the cost noted above for adding FYA operations to Southcross Drive.

- Signal service cabinet is the original cabinet, has some rust, and is recommended to be upgraded to a battery back-up ready cabinet for future flexibility. This can be accomplished using the existing cabinet concrete pad. Estimated cost to replace this cabinet is $7,500. Estimated cost to make this cabinet fully battery back-up (with batteries and inverter) including cabinet replacement is $12,000.

For budgeting purposes, we recommend that the City upgrade all pedestrian curb ramps, add the APS push buttons, upgrade pedestrian signals to be Countdown Timers, and upgrade the signal service cabinet (without batteries) within the next 5 years. Estimated cost to complete each of these items is approximately $166,000.

Repainting of the signal system should not be required in the next 5 years. FYA operations are also not recommended to be installed at this time given that the signal system already has dedicated left turn phasing for each Southcross Drive approach and Portland Avenue is operating well without dedicated left turn phasing – this is recommended to be completed only if there is roadway reconstruction work that impacts the signal system, or if the City is converting all other signal approaches in the City that have protected/permissive left turn phasing to FYA operations.

19. SOUTHCROSS DRIVE AT CHICAGO AVENUE

- Installation date – 1997.
- Log book review – no recent issues noted.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in good condition and repainting is recommended in 5-7 years.
- Street lights are LED.
- Curb ramps are older and do not meet ADA requirements due to steep grades and truncated dome locations. This intersection is recommended to have curb ramps upgraded either in the next 3-5 years, or as part of any impending roadway improvements on either roadway. Estimated cost to upgrade curb ramps on each quadrant is $125,000.
- Signal system has older pedestrian push buttons (6 of the 8 push buttons are NOT ADA compliant) and these should be upgraded to at least an ADA compliant push button in the next 1-2 years. Estimated cost to upgrade 6 existing push buttons to be ADA compliant at their current locations is $1,500.

If curb ramp upgrades are delayed, signal system should still be able to be modified in the interim to add APS push buttons with only minor concrete work on each quadrant (adding

sidewalk behind existing walks to allow for push button station installations). Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $25,000.

- Pedestrian indications are non-standard 12-inch 2-section Hand/Walking Person indications without Countdown Timers and are recommended to be upgraded to the current standard 16-inch one-section Hand/Walking Person indications (with Countdown Timers) within the next 1-2 years. Estimated cost to remove the aged pedestrian indications (and pole mounted bracketing) and install new one-section Countdown Timer pedestrian indications is $8,000.
- Signal system does not have Flashing Yellow Arrows (FYA) for any intersection approach. Protected/permissive left turn phasing exists on each Southcross Drive approach and allows for dedicated left turn movements so FYA operation is not critical for this signal system. As there are no dedicated left turn lanes for either Chicago Avenue approach, dedicated left turn phasing is not needed.

Should the City want to have FYA operations for Southcross Drive, the controller and cabinet will need to be replaced (does not have capacity to accommodate FYA operations). Mast arms are good for FYA signal head installations but additional through (RYG) signal heads are needed on both mast arms to have a separate signal head centered on each through and left turn lane. Estimated cost to upgrade this signal to have FYA operations is $50,000 which includes replacement of the controller and cabinet.

- Signal service cabinet is the original cabinet, has some rust, and is recommended to be upgraded to a battery back-up ready cabinet for future flexibility. This can be accomplished using the existing cabinet concrete pad. Estimated cost to replace cabinet is $7,500. Estimated cost to make this cabinet fully battery back-up (with batteries/inverter) including cabinet replacement is $12,000.

For budgeting purposes, we recommend that the City upgrade all pedestrian curb ramps, add the APS push buttons, upgrade pedestrian signals to be Countdown Timers, and upgrade the signal service cabinet (without batteries) within the next 5 years. Estimated cost to complete each of these items is approximately $166,000.

Repainting of the signal system should not be required in the next 5 years. FYA operations are also not recommended to be installed at this time given that the signal system already has dedicated left turn phasing for each Southcross Drive approach – this is recommended to be completed only if there is roadway reconstruction work that impacts the signal system, or if the City is converting all other signal approaches in the City that have protected/permissive left turn phasing to FYA operations.

20. SOUTHCROSS DRIVE AT LAC LAVON DRIVE

- Installation date – 1997 (minor modifications completed in 2007).
- Log book review – no recent issues noted.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in poor condition (rusty/fading) and repainting is recommended in 3-5 years.
- Street lights are LED.
- Curb ramps are older and do not meet ADA requirements due to steep grades and truncated dome locations. This intersection is recommended to have curb ramps upgraded either in the next 3-5 years, or as part of any impending roadway improvements on either roadway. Estimated cost to upgrade curb ramps on each quadrant is $125,000.
- Signal system has ADA compliant push buttons but does not have APS (audible) buttons.

If curb ramp upgrades are delayed, signal system should still be able to be modified in the interim to add APS push buttons with only minor concrete work on each quadrant (adding sidewalk behind existing walks to allow for push button station installations). Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $25,000.

- Pedestrian indications are the standard one-section hand/walking person indications, but do NOT have Countdown Timer indications.

These can be added to the signal system by replacing the lenses inside each pedestrian signal housing, and this is recommended to be completed by the City. Estimated cost to upgrade pedestrian signals to have Countdown Timer indication lenses is $5,000 (for 8 indications).

- Signal system does not have Flashing Yellow Arrows (FYA) for any intersection approach. Protected/permissive left turn phasing exists on all four intersection approaches and allows for dedicated left turn movements so FYA operation is not critical for this signal system.

Should the City want to have FYA operations, the controller and cabinet will need to be replaced (does not have capacity

to accommodate FYA operations). For Southcross Drive, mast arms are good for FYA signal head installations but additional through (RYG) signal heads are needed on both mast arms to have a separate signal head centered on each through and left turn lane. For Lac Lavon Drive, both mast arms will require a 3-5 foot extension to be able to center the left turn signal on the approaching left turn lane. Lac Lavon Drive mast arms will also need to have RYG signal head added to the existing mast arms to be able to center these over the approaching through lanes. Estimated cost to upgrade this signal system to have FYA operations for all four intersection approaches is $60,000 which includes replacement of the controller and cabinet.

- Signal service cabinet is the original cabinet, has some rust, and is recommended to be upgraded to a battery back-up ready cabinet for future flexibility. This can be accomplished using the existing cabinet concrete pad. Estimated cost to replace cabinet is $7,500. Estimated cost to make this cabinet fully battery back-up (with batteries/inverter) including cabinet replacement is $12,000.

For budgeting purposes, we recommend that the City upgrade all pedestrian curb ramps, add the APS push buttons, upgrade pedestrian signals to be Countdown Timers, upgrade the signal service cabinet (without batteries), and repaint the signal system within the next 5 years. Estimated cost to complete each of these items is approximately $173,000 (including an estimated $10,000 for repainting the signal system).

FYA operations are not recommended to be installed at this time given that the signal system already has dedicated left turn phasing for each intersection approach – this is recommended to be completed only if there is roadway reconstruction work that impacts the signal system, or if the City is converting all other signal approaches in the City that have protected/permissive left turn phasing to FYA operations.

21. WILLIAMS DRIVE AT MORGAN AVENUE

- Installation date – 2002 (recent modifications completed in 2020).
- Log book review – no recent issues noted.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in fair condition (faded and rust appearing), and repainting is recommended in 3-5 years.
- Street lights are LED.
- Curb ramps were upgraded in 2020 and are meeting ADA requirements.
- Signal system has APS push buttons and separate free-standing APS push button stations where needed to ensure that push buttons are properly placed next to curb ramp landing areas.
- Pedestrian indications are the standard one-section hand/walking person indications with Countdown Timer indications.
- Signal system does not have Flashing Yellow Arrows (FYA) for the Williams Drive approaches. Protected/permissive left turn phasing exists and allows for dedicated left turn movements so FYA operation is not critical for this signal system. Note that Morgan Avenue approaches do not have dedicated left turn lanes and left turn phasing is thus not needed.

Should the City want to have FYA operations, the controller and cabinet will be able to be reused (has capacity to accommodate FYA operations). Both mast arms are good for a FYA signal head installation but an additional through (RYG) signal head is needed on the eastbound facing mast arm to have a separate signal head centered on each through and left turn lane. Estimated cost to upgrade this signal system to have FYA operations is $15,000 which includes minor modifications to the controller cabinet.

- Signal service cabinet is the original cabinet and is recommended to be upgraded to a battery back-up ready cabinet for future flexibility. This can be accomplished using the existing cabinet concrete pad. Estimated cost to replace this cabinet is $7,500. Estimated cost to make this cabinet fully battery back-up (with batteries/inverter) including cabinet replacement is $12,000.

For budgeting purposes, we recommend that the City upgrade the signal service cabinet (without batteries) and repaint the signal system within the next 5 years. Estimated cost to complete each of these items is approximately $18,000 (including an estimated $10,000 to repaint the signal system).

FYA operations are not recommended to be installed at this time given that the signal system already has dedicated left turn phasing for each Williams Drive approach – this is recommended to be completed only if there is roadway reconstruction work that impacts the signal system, or if the City is converting all other signal approaches in the City that have protected/permissive left turn phasing to FYA operations.

CITY FLASHER SYSTEMS

22. BURNSVILLE PARKWAY AT UPTON AVENUE CROSSWALK (RRFB) FLASHER

- Installation date – 1999 (recently upgraded in 2015).

- System includes RRFBs on north and south sides of Burnsville Parkway, east of Upton Avenue, is solar powered, and has ADA compliant push buttons in the area of the curb ramps.
- Both pedestal poles are in need of replacement as both poles are too short for the existing signs (signs should be at least 7 feet above ground but are less than 3 feet above ground), the north side pole is very rusty, and the south side pole is very loose (wobbles a lot). We recommend having the existing RRFB flashers and solar equipment salvaged and reinstalled on new flasher poles to extend the life of this flasher system and address above concerns. Estimated cost to remove and replace the two flasher poles is $4,000.
- Curb ramps are ADA compliant but push button locations with respect to these curb ramps are too far from the ramps. We recommend that new push button stations be added on both sides of the crosswalk and placed up against the landing areas of each curb ramp to make these ADA accessible. Estimated cost to add 2 new push button stations and place push buttons up against the landing areas is $6,000.

The existing pedestrian crosswalk flasher system at Burnsville Parkway-Upton Avenue has aged pedestal poles and poorly placed push buttons for pedestrian access and we recommend that the pedestal poles be replaced and separate push button stations added closer to the landing areas of the curb ramps. Curb ramps are ADA compliant and we only recommend improvements to the overall flasher system (reusing some components such as the RRFBs and the solar panels) in order to extend the useful life of this system and make push button locations ADA compliant.

For budgeting purposes, we recommend that the City upgrade the two flasher pedestal poles and bases and add push button stations where ADA compliant curb ramps are located within the next 5 years. Estimated cost to complete each of these items is approximately $10,000.

23. LAC LAVON DRIVE SPEED SIGN INSTALLATIONS (NEAR LAC LAVON PARK)

- Installation date – 2007.
- System includes Your Speed dynamic speed display signs for both approaches of Lac Lavon Drive north of Lac Lavon Park and Crystal Lake Road. Poles are mounted on standard traffic signal pedestal poles, and system is hardwired to a service disconnect located south of the two flasher poles. All system components are working properly.
- Both pedestal poles and bases are recommended to be sanded and repainted within the next 3-5 years to address rust and fading of these poles, and to extend the useful life of these poles and flasher system. Estimated cost to repaint these flasher poles is $1,000.

For budgeting purposes, we recommend that the City sand and repaint each flasher pole within the next 5 years. Estimated cost to complete this work is approximately $1,000.

24-25. BURNHAVEN DRIVE AND 140TH STREET FIRE STATION WARNING FLASHER SYSTEMS

- Installation date of Burnhaven Drive warning flashers is 2010.
- The Burnhaven Drive flasher system includes radio controlled flashers both north and south of 140th Street on signal pedestal poles, a pedestal pole directly across from westbound 140th Street with an Emergency Vehicle Preemption (EVP) detector, and miscellaneous signing and wireless control equipment. Poles are galvanized and do not require painting.
- There is also a stand-alone flasher pole facing eastbound 140th Street (east of Burnhaven Drive) near an existing fire station (which appears to be getting rebuilt in 2022).
- The eastbound 140th Street flasher pole has non-standard 8-inch LED yellow flashers that are recommended to be replaced with 12-inch yellow flashers. The existing Fire Station sign is also faded and is recommended to be replaced. The remainder of this flasher pole is in good condition with repainting of this pole recommended in the next 5-7 years. Estimated cost to complete the above mentioned upgrades to this flasher pole is $2,000.

For budgeting purposes, no work is anticipated to be required on the Burnhaven Drive flasher system in the next 5 years. For the eastbound 140th Street flasher installation, we recommend that the City upgrade the flashers to be 12-inch yellow LED flashers and replace the W11-8 fire station sign within the next 5 years. Estimated cost to complete this work is approximately $2,000.

26-27. RIVER HILLS DRIVE – SIOUX TRAIL ELEMENTARY SCHOOL ADVANCE WARNING FLASHER SIGNS

- Installation date: 2012.
- System includes LED flashing School pentagon signs on signal pedestal poles (west of Southview Drive, and south of 27th Avenue). Signs are solar powered and poles are galvanized (no painting).
- With this school closed in 2020, City should decide if these signs and flasher poles should be removed and potentially

reused elsewhere in the City. Both poles have screw-in foundations, so nearly all of the two flasher pole installations could be salvaged and stored for future use.

- Flasher poles and equipment could be removed by City personnel, and no estimated cost is attached to potential work at this flasher system.

28. BURNSVILLE PARKWAY AT EAGLE RIDGE DRIVE CROSSWALK (RRFB) FLASHER

- Installation date: 2015.
- System includes solar powered pedestal pole mounted flasher poles with RRFBs for crossing the east leg of the Eagle Ridge Drive intersection. Poles are located in the boulevards and on the median. System is push button actuated with ADA compliant solid-state push buttons. Paint is in good condition and repainting of these flasher poles is recommended in 5-7 years.
- Curb ramps appear to be reasonably ADA compliant with some slope concerns on the boulevard ramps but these ramps should be acceptable to maintain as is until any future work is completed along Burnsville Parkway that would necessitate modifications to these ramps.
- The only concern with this system is the low height that signs are installed on the flasher poles. The Down Arrow signs on the boulevard poles are only about 5 feet above ground and are recommended to be at least 7 feet above ground to protect pedestrians from hitting the corners of these signs. Flasher poles have sufficient height to allow for all signs and the RRFBs to be raised to gain the needed height. Estimated cost to raise the two signs and RRFB on each boulevard flasher pole (and move the flasher cabinet on the north side pole to the west side of this flasher pole) is $2,500.
- We also recommend adding Down Arrow signs to the median flasher pole so that there are Down Arrow signs on both the left and right sides of each approach to the crosswalk. Estimated cost to add Down Arrow signs to this flasher pole (and potentially raise other pole mounted equipment as necessary) is $2,000.
- City could consider replacing the three solid state push buttons with APS (audible) push buttons (estimated cost of $3,000 to complete this upgrade) to match other RRFB system operations within the City. However, existing push buttons do meet ADA compliance and this is only recommended if the City has received requests from local residents/pedestrians to have this type of push button provided at this location.

For budgeting purposes, we recommend that the City consider raising the boulevard signs/RRFBs and add Down Arrow signs to the median flasher pole to make this flasher system consistent with other crosswalk flasher systems in the City, within the next 5 years. Estimated cost to complete this work is approximately $4,500.

29. WILLIAM DRIVE AT JUDICIAL ROAD CROSSWALK (RRFB) FLASHER SYSTEM

- Installation date: 2018.
- System includes hardwired pedestal pole mounted flasher poles with RRFBs for crossing the west leg of the Judicial Road intersection. Poles are located in the boulevards. System is push button actuated with APS (audible) push buttons.
- Curb ramps are ADA compliant.
- System is newer with galvanized flasher poles (no painting required), and all components were operational and of the appropriate height on the day of our field review.

No work is anticipated to be required by the City on this flasher system in the next 5 years.

30. BURNSVILLE PARKWAY AT GIRARD AVENUE CROSSWALK (RRFB) FLASHER SYSTEM

- Installation date: 2018.
- System includes solar powered pedestal pole mounted flasher poles with RRFBs for crossing the west leg of the Girard Avenue intersection. Poles are located in the boulevards and also on the west median. System is push button actuated with ADA compliant solid-state push buttons.
- Curb ramps are ADA compliant.
- System is newer with galvanized flasher poles (no painting required), and all components were operational and of the appropriate height on the day of our field review.
- City could consider replacing the two solid state push buttons with APS (audible) push buttons (estimated cost of $2,000 to complete this upgrade) to match other RRFB system operations within the City. However, existing push buttons do meet ADA compliance and this is only recommended if the City has received requests from local residents/pedestrians to have this type of push button provided at this location.

No work is anticipated to be required by the City on this flasher system in the next 5 years.

31. BURNSVILLE PARKWAY AT PARK AVENUE CROSSWALK (RRFB) FLASHER SYSTEM

- Installation date: 2018.
- System includes solar powered pedestal pole mounted flasher poles with RRFBs for crossing the north leg of the Park Avenue intersection. Poles were originally located in the boulevards and also on the north median. System is push button actuated with ADA compliant solid-state push buttons. Poles are galvanized and do not require painting.
- Curb ramps are ADA compliant.
- On the day of our field review, the median flasher pole was fully missing (pole appears to have been hit based on bent anchor rods that still remain in the median foundation). The west side flasher pole had also recently been hit and was laying on the ground. From a subsequent follow up site visit, the west side pole was also fully removed from the site.
- The east side flasher pole continues to work but is missing the W11-2 sign.
- If this system is maintained, it is likely that the median flasher pole will not be reinstalled.
- Work on this system appears to be all maintenance related and no recommended upgrades are noted.
- City could consider replacing the two solid state push buttons with APS (audible) push buttons (estimated cost of $2,000 to complete this upgrade) to match other RRFB system operations within the City. However, existing push buttons do meet ADA compliance and this is only recommended if the City has received requests from local residents/pedestrians to have this type of push button provided at this location.

No work (outside of maintenance work) is anticipated to be required by the City on this flasher system in the next 5 years.

32. FAIRVIEW DRIVE (NEAR PARK NICOLLET URGENT CARE ACCESS) CROSSWALK (RRFB) FLASHER SYSTEM

- Installation date: 2019.
- System includes solar powered and sign post mounted RRFBs for crossing Fairview Drive (mid-block crosswalk). Poles are located in the boulevards. System is push button actuated with ADA compliant solid-state push buttons.
- Curb ramps are ADA compliant.
- Flasher poles are not located up against the curb ramp landing areas, such that push buttons are at least 6-12 feet away from the crosswalk and curb ramp areas and push buttons can only be accessed by pedestrians walking in the boulevard areas to push each button. We recommend that separate free-standing push button stations be added adjacent to each crosswalk and curb ramp for ADA compliant access to these push buttons. Estimated cost to add push button stations and relocate push buttons to these locations is $6,000.
- For southbound traffic, an existing street light pole on the east side of Fairview Drive blocks the view of the far left RRFB so that only one RRFB is generally visible to southbound traffic. We recommend that the east side RRFBs and flasher signs be combined with the street light pole to enhance visibility or have a second sign post installation installed north of the street light pole for installation of the left side RRFB. Estimated cost to either relocate flasher components onto the light pole or have a separate sign post installation placed for the southbound facing RRFB is $2,000.
- With regards to the west side flasher installation, there is a tree just north of this flasher that will block the southbound view of the RRFB when tree gets larger. We recommend that this tree be removed or relocated so that flasher is not blocked.
- City could consider replacing the two solid state push buttons with APS (audible) push buttons (estimated cost of $2,000 to complete this upgrade) to match other RRFB system operations within the City. However, existing push buttons do meet ADA compliance and this is only recommended if the City has received requests from local residents/pedestrians to have this type of push button provided at this location.

We are not sure if this flasher system is City owned or privately owned. However, we do recommend that the modifications listed above be completed to enhance visibility of all RRFBs and locate push buttons for reasonable and ADA compliant access. Estimated cost to complete both of these modifications is $8,000 and we recommend that these be budgeted for and completed in the next 1-3 years.

33. JUDICIAL ROAD (NEAR ROSE PARK) MID-BLOCK CROSSWALK (RRFB) FLASHER SYSTEM

- Installation date: 2020.
- System includes solar powered pedestal pole mounted flasher poles with RRFBs for crossing Judicial Road (mid-block crosswalk). Poles are located in the boulevards. System is push button actuated with APS (audible) push buttons.
- Curb ramps are ADA compliant.
- System is newer with galvanized flasher poles (no painting required), and all components were operational and of the appropriate height on the day of our field review.

No work is anticipated to be required by the City on this flasher system in the next 5 years.

34-35. NICOLLET BOULEVARD (NEAR FAIRVIEW HOSPITAL) MID-BLOCK CROSSWALK (RRFB/LED) FLASHER SYSTEMS

- Both mid-block crosswalk flasher systems are being fully replaced in 2022 and will include RRFBs on the north/south boulevards and in the center median, LED enhanced signs on the same poles as the RRFBs, and audible push buttons. Systems will be hardwired for power. Existing in-pavement flashers are being removed with this project.

No work is anticipated to be required by the City on either flasher system in the next 5 years.

COUNTY SIGNAL SYSTEMS

1. CSAH 5 AT WILLIAMS DRIVE

- Installation date: 2013.
- Signal system was fully rebuilt in 2013 with ADA compliant curb ramps, APS push buttons, flashing yellow arrow operation, Countdown Timer pedestrian indications, and non-painted signal poles.
- Potential work items could include upgrading the 4 street lights to be LED (estimated at $4,000) and replacing all overhead street name signs on each mast arm (signs are faded and cracked) (estimated at $5,000).

For budgeting purposes (should the City want to upgrade street lights to be LED and replace overhead street name signs, all in the next 5 years), estimated cost to complete each of these items is approximately $9,000.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially the two items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

2. CSAH 5 AT BURNSVILLE PARKWAY

- Installation date: 2019.
- Signal system was fully rebuilt in 2019 with ADA compliant curb ramps, APS push buttons, flashing yellow arrow operation, Countdown Timer pedestrian indications, and non-painted signal poles.
- No potential work items were noted in our field review.

No cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

3. CSAH 5 AT 136TH STREET

- Installation date: 2019.
- Signal system was fully rebuilt in 2019 with ADA compliant curb ramps, APS push buttons, flashing yellow arrow operation, Countdown Timer pedestrian indications, and non-painted signal poles.
- No potential work items were noted in our field review.

No cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

4. CSAH 5 AT CSAH 38 (MCANDREWS ROAD)

- Installation date: 2008.
- As part of an ongoing County project in 2022, the signal system will be upgraded to include Flashing Yellow Arrows (FYA) for 3 of the 4 intersection approaches, installation of a PTZ (surveillance) camera, and fiber optic interconnect along CSAH 38 to the east.
- County does not have any other upgrades planned for this intersection in the next 5 years.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in fair condition (some rust and peeling paint noted) and repainting is recommended in 3-5 years.
- Potential work items could include upgrading the 2 street lights to be LED (estimated at $2,000) and replacing all overhead street name signs on each mast arm (signs are faded and cracked) (estimated at $5,000).
- Curb ramps are older and do not meet ADA requirements due to steep grades and truncated dome locations. We recommend that curb ramps either be upgraded separately (by the City) or as part of any future intersection improvements. Estimated cost to upgrade curb ramps on each quadrant is $150,000 (including cutting back median nose on the north leg of intersection.
- Signal system has ADA compliant push buttons but does not have APS (audible) buttons. If curb ramp upgrades are delayed, signal system could be modified in the interim

(pending County approval) to add APS push buttons with only minor concrete work on each quadrant (adding sidewalk behind existing walks to allow for push button station installations). Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $30,000.

For budgeting purposes (should the City want to upgrade curb ramps and/or pedestrian push button operation on their own, upgrade street lights to be LED, replace overhead street name signs, and repaint the signal system, all in the next 5 years), estimated cost to complete each of these items is approximately $197,000 (including an estimated $10,000 for repainting the signal system).

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

5. CSAH 5 AT CSAH 42

- Installation date: 2008.
- As part of an ongoing County project in 2022, the signal system will be upgraded to include ADA compliant curb ramps, APS push buttons, and video detection for each intersection approach.
- County does not have any other upgrades planned for this intersection in the next 5 years.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in fair condition (some rust and peeling paint noted) and repainting is recommended in 3-5 years.
- Potential work items could include upgrading the 4 street lights to be LED (estimated at $4,000) and replacing all overhead street name signs on each mast arm (signs are faded and cracked) (estimated at $5,000).
- Flashing Yellow Arrow operations are not present on any approach and County does not have any current plans to incorporate this operation at this intersection.

For budgeting purposes (should the City want to upgrade street lights to be LED, replace overhead street name signs, and repaint the signal system in the next 5 years), estimated cost to complete this work is approximately $19,000 (including an estimated $10,000 for repainting the signal system).

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

6. CSAH 5 AT 143RD STREET

- Installation date: 2001.
- County does not have any upgrades planned for this intersection in the next 5 years.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in fair condition (some rust and peeling paint noted) and repainting is recommended in 3-5 years.
- Potential work items could include upgrading the 2 street lights to be LED (estimated at $2,000).
- Curb ramps are older and do not meet ADA requirements due to steep grades and truncated dome locations. We recommend that curb ramps either be upgraded separately (by the City) or as part of any future intersection improvements. Estimated cost to upgrade curb ramps on each quadrant is $125,000.
- Signal system has ADA compliant push buttons but does not have APS (audible) buttons. If curb ramp upgrades are delayed, signal system could be modified in the interim (pending County approval) to add APS push buttons with only minor concrete work on each quadrant (adding sidewalk behind existing walks to allow for push button station installations). Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $25,000.
- Flashing Yellow Arrow operations are not present on any approach and County does not have any current plans to incorporate this operation at this intersection.

For budgeting purposes (should the City want to upgrade curb ramps and/or pedestrian push button operation on their own, upgrade street lights to be LED, and repaint the signal system, all in the next 5 years), estimated cost to complete each of

these items is approximately $162,000 (including an estimated $10,000 for repainting the signal system).

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

7. CSAH 5 AT SOUTHCROSS DRIVE

- Installation date: 1990.
- County is currently planning for this signal system to be removed and replaced as part of their own 2023-2027 CIP. Any signal improvements at this intersection would include upgrading all pedestrian curb ramps to be ADA compliant and adding APS push buttons.
- Signal system is 32 years old and in need of significant upgrades. Signal system is also in need of repainting (significant rust/peeling) but this is not recommended to be completed due to impending full replacement of this signal system.
- Street lights are not LED.
- Curb ramps are older and do not meet ADA requirements due to steep grades and truncated dome locations. We recommend that curb ramps be upgraded as part of the future intersection improvements.
- Signal system has ADA compliant push buttons but does not have APS (audible) buttons. We do not recommend that these push buttons be upgraded on an interim basis to be APS push buttons due to impending reconstruction of signal system.

For budgeting purposes, estimated cost to fully replace this signal system and upgrade all curb ramps to be ADA compliant is approximately $600,000. We recommend that the City budget for 1/2 of these costs based on typical cost sharing on City/County legs of the intersection (or $300,000) in the next 5 years.

8. CSAH 5 AT 150TH STREET

- Installation date: 1995.
- County does not have any upgrades planned for this intersection in the next 5 years. However, this signal system falls just outside of the 10 oldest signal systems on County Roads within the City (which are projected to be replaced by the County between 2023-2027), and it is reasonable to assume that this signal system would be considered for full replacement in the next County CIP (2028-2032).
- Signal system is in fair condition and should be able to be maintained and operated for at least 5-10 more years. Paint is in poor condition (significant rust and peeling paint noted) and repainting is recommended in 3-5 years.
- Street lights are LED.
- Pedestrian indications are standard one-section Hand/Walking Person indications but do NOT have Countdown Timer indications. We recommend that the lenses in these 8 pedestrian signal housings be removed and replaced to have Countdown Timer indications should the City elect to proceed with any curb ramp improvements on their own. Estimated cost to upgrade these 8 pedestrian signals to have Countdown Timer lenses is $5,000.
- Curb ramps are older and do not meet ADA requirements due to steep grades and truncated dome locations. We recommend that curb ramps either be upgraded separately (by the City) or as part of any future intersection improvements. Estimated cost to upgrade curb ramps on each quadrant is $175,000 (including anticipated retaining wall installations on the NW and SW quadrants due to steep grades in the boulevards on these quadrants).
- Signal system has ADA compliant push buttons (for crossing CSAH 5 only) but does not have APS (audible) buttons. Given the topography on the NW and SW corners, it would be difficult to modify this signal system in the interim to add APS push buttons on these quadrants without needing to complete significant curb ramp and retaining wall work (there are currently no curb cuts on the NW and SW corners for pedestrian access to push buttons). Thus, we do not recommend interim APS push button installations at this intersection, and only recommend upgrading this signal system to have APS push buttons with full curb ramp construction on all 4 quadrants. Estimated cost to upgrade signal system to have APS push buttons (as part of overall curb ramp construction) is $25,000.
- Flashing Yellow Arrow operations are not present on any approach and County does not have any current plans to incorporate this operation at this intersection.

For budgeting purposes (should the City want to upgrade curb ramps and pedestrian push button operation on their own, add Countdown Timer lenses, and repaint the signal system, all in the next 5 years), estimated cost to complete each of these items is approximately $215,000 (including an estimated $10,000 for repainting the signal system).
If instead, the City would rather wait to see if this signal system is scheduled for full replacement within the next 10

years, estimated cost to fully replace this signal system and upgrade all curb ramps to be ADA compliant is approximately $600,000. In this case, we recommend that the City budget for 1/2 of these costs based on typical cost sharing on City/County legs of the intersection (or $300,000) in the next 5-10 years.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

9. CSAH 11 AT 122ND STREET

- Installation date: 2001.
- County does not have any upgrades planned for this intersection in the next 5 years.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in fair condition (some rust and peeling paint noted) and repainting is recommended in 3-5 years.
- Potential work items could include upgrading the 2 street lights to be LED (estimated at $2,000).
- Pedestrian indications are standard one-section Hand/Walking Person indications but do NOT have Countdown Timer indications. We recommend that the lenses in these 8 pedestrian signal housings be removed and replaced to have Countdown Timer indications should the City elect to proceed with any curb ramp improvements on their own. Estimated cost to upgrade these 8 pedestrian signals to have Countdown Timer lenses is $5,000.
- Curb ramps are older and do not meet ADA requirements due to steep grades and truncated dome locations. We recommend that curb ramps either be upgraded separately (by the City) or as part of any future intersection improvements. Estimated cost to upgrade curb ramps on each quadrant is $125,000.
- Signal system has a mixture of ADA compliant and non-ADA compliant push buttons (including push buttons for only crossing CSAH 11) but does not have APS (audible) buttons. If curb ramp upgrades are delayed, signal system could be modified in the interim (pending County approval) to add APS push buttons with only minor concrete work on each quadrant (adding sidewalk behind existing walks to allow for push button station installations). Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $30,000.
- Flashing Yellow Arrow operations are not present on any approach and County does not have any current plans to incorporate this operation at this intersection.

For budgeting purposes (should the City want to upgrade curb ramps and/or pedestrian push button operation on their own, add Countdown Timer lenses, upgrade street lights to be LED, and repaint the signal system, all in the next 5 years), estimated cost to complete each of these items is approximately $172,000 (including an estimated $10,000 for repainting the signal system).

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

10. CSAH 11 AT BURNSVILLE PARKWAY

- Installation date: 1986.
- County is currently in preliminary and final design to have this signal system be removed and replaced with a roundabout and this work is anticipated to be completed in 2023 or 2024. Thus, no interim signal or curb ramp improvements are recommended to be completed at this intersection.
- City share of the costs to have a roundabout constructed are likely already budgeted for and thus are not included in this analysis for 2023-2027 planning.

11. CSAH 11 AT 137TH STREET/PALOMINO DRIVE

- Installation date: 2001.
- As part of an impending County project in 2022 or 2023, the signal system will be upgraded to include Flashing Yellow Arrows (FYA) for the CSAH 11 intersection approaches.
- County does not have any other upgrades planned for this intersection in the next 5 years.
- Signal system is in good condition and should be able to be

maintained and operated for at least 10 more years. Paint is in good condition and repainting is recommended in 5-7 years.

- Potential work items could include upgrading the 2 street lights to be LED (estimated at $2,000).
- Pedestrian indications are standard one-section Hand/Walking Person indications but do NOT have Countdown Timer indications. We recommend that the lenses in these 8 pedestrian signal housings be removed and replaced to have Countdown Timer indications should the City elect to proceed with any curb ramp improvements on their own. Estimated cost to upgrade these 8 pedestrian signals to have Countdown Timer lenses is $5,000.
- Curb ramps are older and do not meet ADA requirements due to steep grades and truncated dome locations. We recommend that curb ramps either be upgraded separately (by the City) or as part of any future intersection improvements. Estimated cost to upgrade curb ramps on each quadrant is $150,000 (including cutting back median noses on the north and south legs of intersection).
- Signal system has mostly non-ADA compliant push buttons (7 of the 8 push buttons are older non-compliant buttons). If curb ramp upgrades are delayed, signal system could be modified in the interim (pending County approval) to add APS push buttons with only minor concrete work on each quadrant (adding sidewalk behind existing walks to allow for push button station installations). Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $30,000.

For budgeting purposes (should the City want to upgrade curb ramps and/or pedestrian push button operation on their own, add Countdown Timers, and upgrade street lights to be LED, all in the next 5 years), estimated cost to complete each of these items is approximately $187,000. Given that portions of this signal system are in Apple Valley, there may be an opportunity to cost share this work with the City if done outside of County planning for the intersection.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

12. CSAH 11 AT CSAH 38 (MCANDREWS ROAD) WEST JUNCTION

- Installation date: 1996.
- As part of an ongoing County project in 2022, the signal system will be upgraded to include Flashing Yellow Arrows (FYA) for the CSAH 38 intersection approaches, installation of a PTZ (surveillance) camera, adding Countdown Timer lenses, and fiber optic interconnect along CSAH 38 to the east and west.
- County does not have any other upgrades planned for this intersection in the next 5 years. However, this signal system falls just outside of the 10 oldest signal systems on County Roads within the City (which are projected to be replaced by the County between 2023-2027), and it is reasonable to assume that this signal system would be considered for full replacement in the next County CIP (2028-2032).
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in good condition and repainting is recommended in 5-7 years.
- Potential work items could include upgrading the 2 street lights to be LED (estimated at $2,000).
- Curb ramps are older and do not meet ADA requirements due to steep grades and truncated dome locations. We recommend that curb ramps either be upgraded separately (by the City) or as part of any future intersection improvements. Estimated cost to upgrade curb ramps on each quadrant is $125,000.
- Signal system has mostly ADA compliant push buttons (3 of the 8 push buttons are older non-compliant buttons). If curb ramp upgrades are delayed, signal system could be modified in the interim (pending County approval) to add APS push buttons with only minor concrete work on each quadrant (adding sidewalk behind existing walks to allow for push button station installations). Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $25,000.

For budgeting purposes (should the City want to upgrade curb ramps and/or pedestrian push button operation, and upgrade street lights to be LED on their own, all in the next 5 years), estimated cost to complete each of these items is approximately $152,000.

If instead, the City would rather wait to see if this signal system is scheduled for full replacement within the next 10 years, estimated cost to fully replace this signal system and upgrade all curb ramps to be ADA compliant is approximately

$600,000. In this case, we recommend that the City budget for 1/4 of these costs based on typical cost sharing on City/County legs of the intersection (or $150,000) in the next 5-10 years.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

13. CSAH 11 AT 140TH STREET HAWK SIGNAL SYSTEM

- Installation date: 2013.
- HAWK pedestrian signal system includes unpainted mast arms and poles, ADA compliant curb ramps, Countdown Timer indications, and APS push buttons.
- County does not have any upgrades planned for this intersection in the next 5 years.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years.
- Potential work items could include upgrading the 2 street lights to be LED (estimated at $2,000).

For budgeting purposes (should the City want to upgrade street lights to be LED on their own in the next 5 years), estimated cost to complete this work is approximately $2,000.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the item listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

14. CSAH 32 (CLIFF ROAD) AT 12TH AVENUE

- Installation date: 1990.
- County is currently listing this signal system as being removed and replaced as part of their own 2023-2027 CIP.
- Signal system is 32 years old but had recent upgrades (ADA ramps, APS push buttons, Flashing Yellow Arrows for CSAH 32, Countdown Timer lenses) and thus signal system should be able to be maintained as is until County programs full replacement.
- Signal system is in need of repainting (significant rust/peeling) and City may want to coordinate with the County on when this signal will actually be replaced. For budgeting purposes, we have included a cost for repainting this signal system in the next 3-5 years.
- Street lights are LED.
- Curb ramps were recently upgraded by the City to be ADA compliant in 2020, and APS push buttons were installed at that time.

For budgeting purposes, estimated cost to fully replace this signal system and modify all curb ramps to fit the new signal system and be ADA compliant is approximately $600,000. We recommend that the City budget for 1/2 of these costs based on typical cost sharing on City/County legs of the intersection (or $300,000) in the next 5 years.

Should this signal system be able to be maintained for longer than 5 years, we recommend that the City budget for the repainting of this signal system in the next 1-3 years (estimated at $10,000).

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

15. CSAH 32 (CLIFF ROAD) AT WEST RIVER HILLS DRIVE

- Installation date: 2020.
- Signal system was fully rebuilt in 2020 with ADA compliant curb ramps, APS push buttons, flashing yellow arrow operation, Countdown Timer pedestrian indications, and non-painted signal poles.
- No potential work items were noted in our field review.

No cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

16. CSAH 32 (CLIFF ROAD) AT RIVER HILLS DRIVE (EAST OF HIGHWAY 13)

- Installation date: 2001.
- County does not have any upgrades planned for this intersection in the next 5 years.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years.
- Paint is in fair condition (rust/peeling paint noted) and repainting is recommended in 3-5 years.
- Street lights are LED.
- Signal system was recently upgraded (in 2020) to have Flashing Yellow Arrows for the CSAH 32 approaches, ADA compliant curb ramps, APS push buttons, and Countdown Timer indications.

For budgeting purposes (should the City want to repaint the signal system in the next 5 years), estimated cost to complete this item is approximately $10,000.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the item listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

17. CSAH 38 (MCANDREWS ROAD) AT PORTLAND AVENUE

- Installation date: 1990.
- County is currently listing this signal system as being removed and replaced as part of their own 2023-2027 CIP.
- However, as part of an ongoing County project in 2022, the signal system will be upgraded to include Flashing Yellow Arrows (FYA) for the CSAH 38 intersection approaches, installation of a PTZ (surveillance) camera, adding Countdown Timer lenses, and fiber optic interconnect along CSAH 38 to the east and west.
- Paint condition is good, and repainting of this signal system is not anticipated to be required for at least 5-7 years (unless signal system is programmed for replacement during that time).
- Street lights are LED.
- Curb ramps are older and generally meet ADA requirements but there are still concerns about ramp locations and landing area grades for overall pedestrian access. We recommend that curb ramps either be upgraded separately (by the City) or as part of any future intersection improvements. Estimated cost to upgrade curb ramps on each quadrant is $125,000.
- Signal system has ADA compliant push but are not APS push buttons. If curb ramp upgrades are delayed or if full signal replacement is delayed, signal system could be modified in the interim (pending County approval) to add APS push buttons with only minor concrete work on each quadrant (adding sidewalk behind existing walks to allow for push button station installations). Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $30,000.

For budgeting purposes, estimated cost to fully replace this signal system and modify all curb ramps to fit the new signal system and be ADA compliant is approximately $600,000. We recommend that the City budget for 1/2 of these costs based on typical cost sharing on City/County legs of the intersection (or $300,000) in the next 5 years.

Should this signal system be able to be maintained for longer than 5 years, we recommend that the City budget for having APS push buttons installed on an interim basis (with limited work on curb ramps due to impending full signal replacement) (estimated at $30,000).

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

18. CSAH 38 (MCANDREWS ROAD) AT NICOLLET AVENUE

- Installation date: 2013.
- Signal system was fully rebuilt in 2013 with ADA compliant curb ramps, APS push buttons, flashing yellow arrow operation, Countdown Timer pedestrian indications, and non-painted signal poles.
- As part of an ongoing County project in 2022, the signal system will be upgraded to include installation of a PTZ

(surveillance) camera and fiber optic interconnect along CSAH 38 to the east and west.

- Potential work items could include upgrading the 4 street lights to be LED (estimated at $4,000).

For budgeting purposes (should the City want to upgrade street lights to be LED in the next 5 years), estimated cost to complete this item is approximately $4,000.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the item listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

19. CSAH 38 (MCANDREWS ROAD) AT NICOLLET BOULEVARD

- Installation date: 1997.
- This signal system falls just outside of the 10 oldest signal systems on County Roads within the City (which are projected to be replaced by the County between 2023-2027), and it is reasonable to assume that this signal system would be considered for full replacement in the next County CIP (2028-2032).
- However, as part of an ongoing County project in 2022, the signal system will be upgraded to include Flashing Yellow Arrows (FYA) for the CSAH 38 intersection approaches, installation of a PTZ (surveillance) camera, adding Countdown Timer lenses, and fiber optic interconnect along CSAH 38 to the east and west.
- Paint condition is good, and repainting of this signal system is not anticipated to be required for at least 5-7 years (unless signal system is programmed for replacement during that time).
- Potential work items could include upgrading the 2 street lights to be LED (estimated at $2,000).
- Curb ramps are older and do not meet ADA requirements due to steep grades and truncated dome locations. We recommend that curb ramps either be upgraded separately (by the City) or as part of any future intersection improvements. Estimated cost to upgrade curb ramps on each quadrant is $125,000.
- Signal system has mostly ADA compliant push buttons (4 of the 6 push buttons are compliant buttons). If curb ramp upgrades are delayed, signal system could be modified in the interim (pending County approval) to add APS push buttons with only minor concrete work on each quadrant (adding sidewalk behind existing walks to allow for push button station installations). Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $25,000.

For budgeting purposes (should the City want to upgrade curb ramps and/or pedestrian push button operation, and upgrade street lights to be LED on their own, all in the next 5 years), estimated cost to complete each of these items is approximately $152,000.

If instead, the City would rather wait to see if this signal system is scheduled for full replacement within the next 10 years, estimated cost to fully replace this signal system and upgrade all curb ramps to be ADA compliant is approximately $550,000. In this case, we recommend that the City budget for 1/3 of these costs based on typical cost sharing on City/County legs of the intersection (or $183,333) in the next 5-10 years.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

20. CSAH 38 (MCANDREWS ROAD) AT ALDRICH AVENUE

- Installation date: 1991.
- County is currently listing this signal system as being removed and replaced as part of their own 2023-2027 CIP.
- However, as part of an ongoing County project in 2022, the signal system will be upgraded to include Flashing Yellow Arrows (FYA) for the CSAH 38 intersection approaches, installation of a PTZ (surveillance) camera, adding Countdown Timer lenses, and fiber optic interconnect along CSAH 38 to the east and west.
- Paint condition is fair (rust and peeling noted), and repainting of this signal system is recommended to be completed in the next 3-5 years (unless signal system is programmed for replacement during that time).

- Potential work items could include upgrading the 2 street lights to be LED (estimated at $2,000).
- Curb ramps are older and generally meet ADA requirements but there are still concerns about ramp locations and landing area grades for overall pedestrian access. We recommend that curb ramps either be upgraded separately (by the City) or as part of any future intersection improvements. Estimated cost to upgrade curb ramps on each quadrant is $175,000 (including pulling back east and west median noses and catch basin relocation on the east median).
- Signal system has ADA compliant push but are not APS push buttons. If curb ramp upgrades are delayed or if full signal replacement is delayed, signal system could be modified in the interim (pending County approval) to add APS push buttons with only minor concrete work on each quadrant (adding sidewalk behind existing walks to allow for push button station installations). Estimated cost to upgrade signal system to have APS push buttons (without any curb ramp improvements and only minor sidewalk work) is $25,000.

For budgeting purposes, estimated cost to fully replace this signal system and modify all curb ramps to fit the new signal system and be ADA compliant is approximately $600,000. We recommend that the City budget for 1/3 of these costs based on typical cost sharing on City/County legs of the intersection (or $200,000) in the next 5 years.

Should this signal system be able to be maintained for longer than 5 years, we recommend that the City budget for having APS push buttons installed on an interim basis (with limited work on curb ramps due to impending full signal replacement), upgrading street lights to be LED, and repainting the signal system (all estimated at $35,000, including $8,000 for repainting the signal system).

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

21. CSAH 42 AT BURNSVILLE PARKWAY

- Installation date: 2008.
- As part of an ongoing County project in 2022, the signal system will be upgraded to include ADA compliant curb ramps and APS push buttons.
- County does not have any other upgrades planned for this intersection in the next 5 years.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in fair condition (some rust and peeling paint noted) and repainting is recommended in 3-5 years.
- Potential work items could include upgrading the 4 street lights to be LED (estimated at $4,000) and replacing all overhead street name signs on each mast arm (signs are faded and cracked) (estimated at $5,000).
- Flashing Yellow Arrow operations are not present on any approach and County does not have any current plans to incorporate this operation at this intersection.

For budgeting purposes (should the City want to upgrade street lights to be LED, replace overhead street name signs, and repaint the signal system, all in the next 5 years), estimated cost to complete this work is approximately $19,000, including $10,000 for repainting the signal system.
Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

22. CSAH 42 AT JUDICIAL ROAD

- Installation date: 2008.
- As part of an ongoing County project in 2022, the signal system will be upgraded to include ADA compliant curb ramps and APS push buttons.
- County does not have any other upgrades planned for this intersection in the next 5 years.
- Signal system is in good condition and should be able to be maintained and operated for at least 10 more years. Paint is in fair condition (some rust and peeling paint noted) and repainting is recommended in 3-5 years.
- Potential work items could include upgrading the 4 street lights to be LED (estimated at $4,000) and replacing all overhead street name signs on each mast arm (signs are faded and cracked) (estimated at $5,000).

- Flashing Yellow Arrow operations are not present on any approach and County does not have any current plans to incorporate this operation at this intersection.

For budgeting purposes (should the City want to upgrade street lights to be LED, replace overhead street name signs, and repaint the signal system, all in the next 5 years), estimated cost to complete this work is approximately $19,000 including $10,000 for repainting the signal system.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

23. CSAH 42 AT IRVING AVENUE

- Installation date: 1990.
- County is currently listing this signal system as being removed and replaced as part of their own 2023-2027 CIP. However, County Road 42 Visioning Study has also identified this signal system as a candidate for removal only.
- As part of an ongoing County project in 2022, the signal system will be upgraded to include ADA compliant curb ramps, APS push buttons, Countdown Timer indications, and video detection for vehicular traffic.
- Paint condition is fair (rust and peeling noted), and repainting of this signal system is recommended to be completed in the next 3-5 years (unless signal system is programmed for replacement during that time).
- Potential work items could include upgrading the 2 street lights to be LED (estimated at $2,000).
- Flashing Yellow Arrow operations are not present on any approach and County does not have any current plans to incorporate this operation at this intersection.

For budgeting purposes, estimated cost to fully replace this signal system and modify all curb ramps to fit the new signal system and be ADA compliant is approximately $600,000. We recommend that the City budget for 1/2 of these costs based on typical cost sharing on City/County legs of the intersection (or $300,000) in the next 5 years.

Should this signal system be able to be maintained for longer than 5 years, we recommend that the City budget for upgrading street lights to be LED, and repainting the signal system (estimated at $12,000, including $10,000 for repainting the signal system).

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

24. CSAH 42 AT BURNHAVEN DRIVE

- Installation date: 1990.
- County is currently listing this signal system as being removed and replaced as part of their own 2023-2027 CIP.
- As part of an ongoing County project in 2022, the signal system will be upgraded to include ADA compliant curb ramps, APS push buttons, Countdown Timer indications, and video detection for vehicular traffic.
- Paint condition is fair (rust and peeling noted), and repainting of this signal system is recommended to be completed in the next 3-5 years (unless signal system is programmed for replacement during that time).
- Potential work items could include upgrading the 4 street lights to be LED (estimated at $4,000).
- Flashing Yellow Arrow operations are not present on any approach and County does not have any current plans to incorporate this operation at this intersection.

For budgeting purposes, estimated cost to fully replace this signal system and modify all curb ramps to fit the new signal system and be ADA compliant is approximately $600,000. We recommend that the City budget for 1/2 of these costs based on typical cost sharing on City/County legs of the intersection (or $300,000) in the next 5 years.

Should this signal system be able to be maintained for longer than 5 years, we recommend that the City budget for upgrading street lights to be LED, and repainting the signal system (estimated at $14,000, including $10,000 for repainting the signal system).

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

25. CSAH 42 AT ALDRICH AVENUE

- Installation date: 1990.
- County is currently listing this signal system as being removed and replaced as part of their own 2023-2027 CIP. However, County Road 42 Visioning Study has also identified this signal system as a candidate for removal only.
- As part of an ongoing County project in 2022, the signal system will be upgraded to include ADA compliant curb ramps, APS push buttons, and Countdown Timer indications.
- Paint condition is fair (rust and peeling noted), and repainting of this signal system is recommended to be completed in the next 3-5 years (unless signal system is programmed for replacement during that time).
- Street lights are LED.
- Flashing Yellow Arrow operations are not present on any approach and County does not have any current plans to incorporate this operation at this intersection.

For budgeting purposes, estimated cost to fully replace this signal system and modify all curb ramps to fit the new signal system and be ADA compliant is approximately $600,000. We recommend that the City budget for 1/2 of these costs based on typical cost sharing on City/County legs of the intersection (or $300,000) in the next 5 years.

Should this signal system be able to be maintained for longer than 5 years, we recommend that the City budget for having the signal system be repainted (estimated at $10,000).

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

26. CSAH 42 AT NICOLLET AVENUE

- Installation date: 1990.
- County is currently listing this signal system as being removed and replaced as part of their own 2023-2027 CIP.
- As part of an ongoing County project in 2022, the signal system will be upgraded to include ADA compliant curb ramps, APS push buttons, Countdown Timer indications, and video detection for vehicular traffic.
- Paint condition is fair (rust and peeling noted), and repainting of this signal system is recommended to be completed in the next 3-5 years (unless signal system is programmed for replacement during that time).
- Potential work items could include upgrading the 4 street lights to be LED (estimated at $4,000).
- Flashing Yellow Arrow operations are not present on any approach and County does not have any current plans to incorporate this operation at this intersection.

For budgeting purposes, estimated cost to fully replace this signal system and modify all curb ramps to fit the new signal system and be ADA compliant is approximately $600,000. We recommend that the City budget for 1/2 of these costs based on typical cost sharing on City/County legs of the intersection (or $300,000) in the next 5 years.

Should this signal system be able to be maintained for longer than 5 years, we recommend that the City budget for upgrading street lights to be LED, and repainting the signal system (estimated at $14,000, including $10,000 for repainting the signal system).

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

27. CSAH 42 AT PLYMOUTH AVENUE

- Installation date: 1991.

- County is currently listing this signal system as being removed and replaced as part of their own 2023-2027 CIP. However, County Road 42 Visioning Study has also identified this signal system as a candidate for removal only.
- As part of an ongoing County project in 2022, the signal system will be upgraded to include ADA compliant curb ramps, APS push buttons, and Countdown Timer indications.
- Paint condition is fair (rust and peeling noted), and repainting of this signal system is recommended to be completed in the next 3-5 years (unless signal system is programmed for replacement during that time).
- Street lights are LED.
- Flashing Yellow Arrow operations are not present on any approach and County does not have any current plans to incorporate this operation at this intersection.

For budgeting purposes, estimated cost to fully replace this signal system and modify all curb ramps to fit the new signal system and be ADA compliant is approximately $600,000. We recommend that the City budget for 1/2 of these costs based on typical cost sharing on City/County legs of the intersection (or $300,000) in the next 5 years.

Should this signal system be able to be maintained for longer than 5 years, we recommend that the City budget for having the signal system be repainted (estimated at $10,000).

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

28. CSAH 42 AT PORTLAND AVENUE

- Installation date: 2012.
- Signal system was fully rebuilt in 2012 with ADA compliant curb ramps, APS push buttons, flashing yellow arrow operation, Countdown Timer pedestrian indications, and non-painted signal poles.
- Potential work items could include upgrading the 4 street lights to be LED (estimated at $4,000).

For budgeting purposes (should the City want to upgrade street lights to be LED in the next 5 years), estimated cost to complete this work is approximately $4,000.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the item listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

29. CSAH 42 AT CSAH 11-LAC LAVON DRIVE

- Installation date: 2012.
- Signal system was fully rebuilt in 2012 with ADA compliant curb ramps, APS push buttons, flashing yellow arrow operation, Countdown Timer pedestrian indications, and non-painted signal poles. Signal system also has LED street lights.

No cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

30. CSAH 42 AT SOUTHCROSS DRIVE/ SUMMIT OAKS DRIVE

- Installation date: 1989.
- County is currently listing this signal system as being removed and replaced as part of their own 2023-2027 CIP. Any signal improvements at this intersection would include upgrading all pedestrian curb ramps to be ADA compliant and adding APS push buttons.
- Signal system is 33 years old and in need of significant upgrades. Signal system is also in need of repainting (significant rust/peeling) but this is not recommended to be completed due to impending full replacement of this signal system.
- Street lights are not LED.
- Curb ramps are older and do not meet ADA requirements due to steep grades and truncated dome locations. We recommend that curb ramps be upgraded as part of the future intersection improvements.
- Signal system has ADA compliant push buttons but does not have APS (audible) buttons. We do not recommend that these push buttons be upgraded on an interim basis to be APS push buttons due to impending reconstruction of signal system.

For budgeting purposes, estimated cost to fully replace this signal system and upgrade all curb ramps to be ADA compliant is

approximately $600,000. We recommend that the City budget for 1/2 of these costs based on typical cost sharing on City/County legs of the intersection (or $300,000) in the next 5 years.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the County as part of their overall County signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the item listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

STATE OWNED SIGNALS

1. HIGHWAY 13 AT CSAH 30 (DIFFLEY)-CEDARBRIDGE AVENUE

- Installation date: 2009.
- Signal system was fully rebuilt in 2009 with ADA compliant curb ramps, APS push buttons, Countdown timer indications, and non-painted signal poles.
- Flashing Yellow Arrow operations are not present on any approach and State does not have any current plans to incorporate this operation at this intersection.
- Potential work items could include upgrading the 4 street lights to be LED (estimated at $4,000).

For budgeting purposes (should the City want to upgrade street lights to be LED in the next 5 years), estimated cost to complete this work is approximately $4,000.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the State as part of their overall State signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the item listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

2. HIGHWAY 13 AT RIVER HILLS DRIVE

- Installation date: 2009.
- Signal system was fully rebuilt in 2009 with ADA compliant curb ramps, APS push buttons, Countdown timer indications, and non-painted signal poles.
- Flashing Yellow Arrow operations are not present on any approach and State does not have any current plans to incorporate this operation at this intersection.
- Potential work items could include upgrading the 2 street lights to be LED (estimated at $2,000).

For budgeting purposes (should the City want to upgrade street lights to be LED in the next 5 years), estimated cost to complete this work is approximately $2,000.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the State as part of their overall State signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the item listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

3. HIGHWAY 13 AT CSAH 32 (CLIFF ROAD)

- Installation date: 1971.
- Signal system is 51 years old and a strong candidate for full replacement but the State does not have any plans to replace this signal system through 2029.
- Signal system was upgraded in 2014 to have ADA compliant ramps and APS push buttons. In 2018, RRFBs and separate push buttons were installed for crossing all 4 of the free right turn islands on Highway 13.
- Paint condition is fair (rust and peeling noted), and repainting of this signal system is recommended to be completed in the next 3-5 years.
- Flashing Yellow Arrow operations are not present on any approach and State does not have any current plans to incorporate this operation at this intersection.
- Potential work items could include upgrading the 2 street lights to be LED (estimated at $2,000).

For budgeting purposes (should the City want to upgrade street lights to be LED and repaint the signal system in the next 5 years), estimated cost to complete this work is approximately $12,000 including $10,000 for repainting the signal system.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the State as part of their overall State signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years. In addition, any signal replacement costs at this location are likely to be borne by the County and the State since the City does not have any City streets entering this intersection.

4. HIGHWAY 13 AT CSAH 11/WEST RIVER HILLS DRIVE

- Installation date: 1986.
- Signal system is 36 years old and a strong candidate for full replacement but the State does not have any plans to replace this signal system through 2029.
- Signal system was upgraded in 2014 to have ADA compliant ramps and APS push buttons. In 2018, RRFBs and separate push buttons were installed for crossing both free right turn islands on Highway 13.
- Paint condition is fair (rust and peeling noted), and repainting of this signal system is recommended to be completed in the next 3-5 years.
- Flashing Yellow Arrow operations are not present on any approach and State does not have any current plans to incorporate this operation at this intersection.

Should this signal system be able to be maintained for longer than 5 years, we recommend that the City budget for having the signal system be repainted (estimated at $10,000).

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the State as part of their overall State signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the item listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years. Any future signal replacement costs at this location are likely to be split between State, City, and County based on the number of intersection approaches under each agency's jurisdiction (in this case 25% City responsibility).

5. HIGHWAY 13 AT PARKWOOD DRIVE/12TH AVENUE

- Installation date: 1978.
- Signal system is 44 years old and a strong candidate for full replacement but the State does not have any plans to replace this signal system through 2029.
- Signal system was upgraded in 2014 to have ADA compliant ramps and APS push buttons.
- Paint condition is fair (rust and peeling noted), and repainting of this signal system is recommended to be completed in the next 3-5 years.
- Flashing Yellow Arrow operations are not present on any approach and State does not have any current plans to incorporate this operation at this intersection.

Should this signal system be able to be maintained for longer than 5 years, we recommend that the City budget for having the signal system be repainted (estimated at $10,000).

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the State as part of their overall State signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the item listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years. Any future signal replacement costs at this location are likely to be split between State and City based on the number of intersection approaches under each agency's jurisdiction (in this case 50% City responsibility).

6. HIGHWAY 13 AT PORTLAND AVENUE

- Installation date: 1984.
- Signal system is 38 years old and a strong candidate for full replacement but the State does not have any plans to replace this signal system through 2029.
- Signal system was upgraded in 2014 to have ADA compliant ramps and APS push buttons. In 2016, flashing yellow arrow operations were installed for the Highway 13 approaches as part of the construction of a second eastbound left turn lane and roundabout to the north on Portland Avenue.
- Paint condition is fair (rust and peeling noted), and repainting of this signal system is recommended to be completed in the next 3-5 years.

- Flashing Yellow Arrow operations are not present for Portland Avenue and State does not have any current plans to incorporate this operation at this intersection.

Should this signal system be able to be maintained for longer than 5 years, we recommend that the City budget for having the signal system be repainted (estimated at $10,000).

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the State as part of their overall State signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the item listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years. Any future signal replacement costs at this location are likely to be split between State and City based on the number of intersection approaches under each agency's jurisdiction (in this case 50% City responsibility).

7. HIGHWAY 13 AT NICOLLET AVENUE

- Installation date: 1973.
- Signal system is 49 years old and a strong candidate for full replacement but the State does not have any plans to replace this signal system through 2029.
- Signal system was upgraded in 2014 to have ADA compliant ramps and APS push buttons. Modifications have occurred to this signal system on several occasions due to roadway construction, and overall this signal system is in good condition.
- Paint condition is good and signal should not need to be repainted for at least 5 years.
- Flashing Yellow Arrow operations are not present on any approach and State does not have any current plans to incorporate this operation at this intersection.

No cost sharing is anticipated to be required by the City on this signal system in the next 5 years. Any future signal replacement costs at this location are likely to be split between State and City based on the number of intersection approaches under each agency's jurisdiction (in this case 50% City responsibility).

8. HIGHWAY 13 AT CSAH 5 NORTH RAMPS

- Installation date: 2013.
- Signal system was fully rebuilt in 2013 with ADA compliant curb ramps, APS push buttons, Countdown timer indications, flashing yellow arrow operations, and non-painted signal poles.
- Potential work items could include upgrading the 4 street lights to be LED (estimated at $4,000).

For budgeting purposes (should the City want to upgrade street lights to be LED in the next 5 years), estimated cost to complete this work is approximately $4,000.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the State as part of their overall State signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the item listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

9. HIGHWAY 13 AT CSAH 5 SOUTH RAMPS

- Installation date: 2013.
- Signal system was fully rebuilt in 2013 with ADA compliant curb ramps, APS push buttons, Countdown timer indications, flashing yellow arrow operations, and non-painted signal poles.
- Potential work items could include upgrading the 2 street lights to be LED (estimated at $2,000).

For budgeting purposes (should the City want to upgrade street lights to be LED in the next 5 years), estimated cost to complete this work is approximately $2,000.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the State as part of their overall State signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the item listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

10. HIGHWAY 13 AT WASHBURN AVENUE

- Installation date: 2017.
- Signal system was fully rebuilt in 2017 with ADA compliant curb ramps, APS push buttons, Countdown timer indications,

flashing yellow arrow operations, LED street lights, and non-painted signal poles.

No cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

11. INTERSTATE 35E NORTH RAMPS AT CSAH 11

- Installation date: 1999.
- State does not have any upgrades planned for this intersection in the next 5 years.
- In 2016, signal system was upgraded to have flashing yellow arrow operations for the northbound approach.
- Paint condition is good, and repainting of this signal system is not needed for at least 5 years.
- Street lights are LED.
- Pedestrian indications are standard one-section Hand/Walking Person indications but do NOT have Countdown Timer indications. We recommend that the lenses in these 6 pedestrian signal housings be removed and replaced to have Countdown Timer indications should the City elect to proceed with any curb ramp improvements on their own. Estimated cost to upgrade these 6 pedestrian signals to have Countdown Timer lenses is $3,000.
- Curb ramps are older and do not meet current ADA requirements. We recommend that curb ramps either be upgraded separately (by the City) or as part of any future intersection improvements. Estimated cost to upgrade curb ramps on each quadrant is $130,000 (including work to upgrade curb ramps on the north median).
- Signal system has mostly non-ADA compliant push buttons (2 of the 3 push buttons are not ADA compliant). In addition, no push buttons exist for crossing either of the ramps to and from Interstate 35E. For this location, it is not likely that the State and County will allow for APS push buttons to be installed on an interim basis without full curb ramp upgrades. Thus, we do not recommend that the City pursue interim installation of APS push buttons. Estimated cost to upgrade signal system to have APS push buttons is $20,000.

Should the State continue to maintain this signal system as-is for longer than 5 years, we recommend that the City budget for having all curb ramps be upgraded to be ADA compliant, have APS push buttons installed, and upgrade to Countdown Timer indications to be installed in the next 5 years. Estimated cost to complete these modifications is $153,000.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the State as part of their overall State signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

12. INTERSTATE 35E SOUTH RAMPS AT CSAH 11

- Installation date: 1999.
- State does not have any upgrades planned for this intersection in the next 5 years.
- In 2016, signal system was upgraded to have flashing yellow arrow operations for the southbound approach.
- Paint condition is good, and repainting of this signal system is not needed for at least 5 years.
- Street lights are LED.
- Pedestrian indications are standard one-section Hand/Walking Person indications but do NOT have Countdown Timer indications. We recommend that the lenses in these 6 pedestrian signal housings be removed and replaced to have Countdown Timer indications should the City elect to proceed with any curb ramp improvements on their own. Estimated cost to upgrade these 6 pedestrian signals to have Countdown Timer lenses is $3,000.
- Curb ramps are older and do not meet current ADA requirements. We recommend that curb ramps either be upgraded separately (by the City) or as part of any future intersection improvements. Estimated cost to upgrade curb ramps on each quadrant is $130,000 (including work to upgrade curb ramps on the south median).
- Signal system has mostly non-ADA compliant push buttons (2 of the 3 push buttons are not ADA compliant). In addition, no push buttons exist for crossing either of the ramps to and from Interstate 35E. For this location, it is not likely that the State and County will allow for APS push buttons to be installed on an interim basis without full curb ramp upgrades. Thus, we do not recommend that the City pursue interim installation of APS push buttons. Estimated cost to upgrade signal system to have APS push buttons is $20,000.

Should the State continue to maintain this signal system as-is for longer than 5 years, we recommend that the City budget for having all curb ramps be upgraded to be ADA compliant, have APS push buttons installed, and upgrade to Countdown Timer indications to be installed in the next 5 years. Estimated cost to complete these modifications is $153,000.

Costs for these improvements are included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the State as part of their overall State signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

13. INTERSTATE 35E EAST RAMPS AT CSAH 42

- Installation date: 1989.
- State does not have any upgrades planned for this intersection in the next 5 years but is currently programming this signal system to be removed and replaced in 2029.
- As part of an ongoing County project in 2022, the signal system will be upgraded to include ADA compliant curb ramps, APS push buttons, and Countdown Timer indications.
- Paint condition is fair (significant rust, fading, and peeling noticed), and repainting of this signal system is recommended to be completed in the next 3-5 years. However, given that this signal system is programmed for full replacement in the next 7 years, we do not recommend that the City incur the costs for repainting this signal system.
- Street lights are LED.
- Flashing Yellow Arrow operations are not present for eastbound CSAH 42 and State does not have any current plans to incorporate this operation at this intersection.

No cost sharing is anticipated to be required by the City on this signal system in the next 5 years. In addition, any signal replacement costs at this location are likely to be borne by the County and the State since the City does not have any City streets entering this intersection.

14. INTERSTATE 35E WEST RAMPS AT CSAH 42

- Installation date: 1989.
- State does not have any upgrades planned for this intersection in the next 5 years but is currently programming this signal system to be removed and replaced in 2029.
- As part of an ongoing County project in 2022, the signal system will be upgraded to include ADA compliant curb ramps, APS push buttons, and Countdown Timer indications.
- Paint condition is fair (significant rust, fading, and peeling noticed), and repainting of this signal system is recommended to be completed in the next 3-5 years. However, given that this signal system is programmed for full replacement in the next 7 years, we do not recommend that the City incur the costs for repainting this signal system.
- Street lights are LED.
- Flashing Yellow Arrow operations are not present for westbound CSAH 42 and State does not have any current plans to incorporate this operation at this intersection.

No cost sharing is anticipated to be required by the City on this signal system in the next 5 years. In addition, any signal replacement costs at this location are likely to be borne by the County and the State since the City does not have any City streets entering this intersection.

15. INTERSTATE 35W EAST RAMPS AT CSAH 42

- Installation date: 1980.
- State is currently programming this signal system to be removed and replaced in 2025.
- As part of an ongoing County project in 2022, the signal system will be upgraded to include ADA compliant curb ramps, APS push buttons, and Countdown Timer indications.
- Paint condition is fair (significant rust, fading, and peeling noticed), but since this signal system is scheduled for full replacement in 2025 repainting is not necessary.
- Flashing Yellow Arrow operations are not present for eastbound CSAH 42 and State does not have any current plans to incorporate this operation at this intersection.

No cost sharing is anticipated to be required by the City on this signal system in the next 5 years. Any future signal replacement costs at this location are likely to be split between State and County based on the number of intersection approaches under each agency's jurisdiction and thus City should not have any cost participation.

16. INTERSTATE 35W WEST RAMPS/BUCK HILL ROAD AT CSAH 42

- Installation date: 2017
- Signal system was fully replaced in 2017 and includes ADA compliant curb ramps, APS push buttons, flashing yellow arrow operations, Countdown Timer indications, LED street lights, and unpainted signal poles.

No cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

17. INTERSTATE 35W EAST RAMPS AT BURNSVILLE PARKWAY

- Installation date: 2009.
- Signal system was fully replaced in 2009 and includes APS push buttons, LED street lights, and Countdown Timer indications.
- State has a 35W roadway project programmed for 2024 or 2025 (between the 35E Split and Cliff Road) which may include modifications to the existing ramp signals through this area (including at the Burnsville Parkway ramps). At this time, proposed modifications to this signal system are unknown but may include adding Flashing Yellow Arrow operations.
- In 2018, intersection was upgraded to have ADA compliant curb ramps on the NW, SE and SW quadrants. Ramps and APS push button placement on these quadrants are good. Curb ramps on the NE quadrant are older and could be considered for modifications, but the push button locations on this quadrant are good and we do not recommend the City budgeting for improvements on this quadrant (any curb ramp upgrades on the NE quadrant can wait until State completes other work at this signal system).
- Paint condition is good, and repainting of this signal system is not needed for at least 5 years.

If the State were to complete the curb ramp and APS push button system work on the northeast quadrant with their Interstate 35W project, it is anticipated that a cost share/split of 75% City – 25% State would be utilized to match the number of intersection approaches under each agency's jurisdiction (or an estimated $22,500 to be budgeted by the City for these improvements). Note that this cost is included under the Signal Replacements Budget cost but is NOT included under the Miscellaneous Costs as this work is projected to be completed only if the State includes this work as part of their 2024-2025 project.

Other than the work noted above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years for any State related work.

18. INTERSTATE 35W WEST RAMPS AT BURNSVILLE PARKWAY

- Installation date: 2009.
- Signal system was fully replaced in 2009 and includes APS push buttons, LED street lights, and Countdown Timer indications.
- State has a 35W roadway project programmed for 2024 or 2025 (between the 35E Split and Cliff Road) which may include modifications to the existing ramp signals through this area (including at the Burnsville Parkway ramps). At this time, proposed modifications to this signal system are unknown but may include adding Flashing Yellow Arrow operations.
- Paint condition is good, and repainting of this signal system is not needed for at least 5 years.
- Curb ramps are older and do not meet current ADA requirements (ramps too steep, and push buttons too far back from intersection to be ADA and APS compliant). We recommend that curb ramps either be upgraded separately (by the City) or as part of any future intersection improvements. Estimated cost to upgrade curb ramps on each quadrant is $125,000.
- Signal system has APS push buttons but several of these are poorly placed for compliant access and we recommend that both the curb ramps and APS push button system be fully upgraded to meet current ADA standards. Estimated cost to upgrade the APS push button system to be ADA compliant is $20,000.

Should the State continue to maintain this signal system as-is for longer than 5 years, we recommend that the City budget for having all curb ramps be upgraded to be ADA compliant and have the APS system upgraded to be fully compliant. Estimated cost to complete these modifications is $145,000.

Note that the State may include these modifications as part of their 2024-2025 Interstate 35W project, and thus the City may want to wait to pursue any modifications to this signal system until the State has confirmed what work they intend to perform with the Interstate 35W project.

If the State were to complete the curb ramp and APS push button system work with their Interstate 35W project, it is anticipated that a cost share/split of 75% City – 25% State would be utilized to match the number of intersection approaches under each agency's jurisdiction (or an estimated $110,000 to be budgeted by the City for these improvements). Note that this cost is included under the Signal Replacements Budget cost.

Costs for these improvements (if done as a stand-alone project) are also included in the overall City budgeting cost spreadsheet. However, as we are unsure whether these costs would be the responsibility of the City or paid for by the State as part of their overall State signal and intersection maintenance costs, the City may need to consider these costs separately from their overall budget planning for signal related work.

Other than potentially for the items listed above, no cost sharing is anticipated to be required by the City on this signal system in the next 5 years.

MISCELLANEOUS SIGNAL UPGRADE ITEMS

As mentioned above, there are several items that the City may wish to consider with regards to specific traffic signal modifications in order to bring signal systems (and intersection pedestrian provisions) up to current design and ADA standards. The attached "Signals-Miscellaneous Items" spreadsheet lists potential modification work for each signal system within the City (including County and State owned and operated signal systems) along with an estimated cost to complete these specific items per intersection. Note that no date has been assigned to these items, as it is unknown how much the City may be able to budget for these specific items on a yearly basis should the City wish to pursue any of these work items.

With regards to the "Signals-Miscellaneous Items" spreadsheet, please note the following:

1. Signal systems where replacement is anticipated to be completed either by the County or the State over the next few years do not show any specific miscellaneous signal work costs listed for these intersections. It is anticipated that many of the miscellaneous signal items would be incorporated into the new signal systems and thus estimated costs for these items are included under the signal replacement budgets.

2. For the City owned signal systems, estimated costs for miscellaneous signal work was included for all of these signal systems (assuming that full signal replacement is not completed for several years) except for the 2 signal systems recommended for full replacement in the next 5 years. If a City owned signal system were to be replaced in the near future, the costs for the miscellaneous signal items would likely be rolled into the overall replacement budget and would not need to be considered separately by the City.

3. On the "Signals Miscellaneous Items" spreadsheet, we have included a "Miscellaneous Other Items" column with potential signal and/or intersection modification work that the City may wish to consider to address potential intersection shortcomings. These items consist of the following:

a. Burnsville Parkway at Irving Avenue – consider adding protected/permissive left turn phasing for the Burnsville Parkway approaches in order to make this signal system compliant with all other signal systems in the City that have dedicated left turn lanes on the main line approaches.

b. Nicollet Avenue at MVTA Park & Ride – consider adding protected/permissive left turn phasing for the southbound Nicollet Avenue approach in order to have left turning movements consistent for both main line approaches and also to match typical signal installations around the City that have dedicated left turn lanes on the main line approaches.

Also, add street light davit arms and LED street lights to the northwest and southeast corner mast arm poles in order to provide sufficient lighting of a unique and larger intersection and for improved pedestrian visibility.

c. Buck Hill Road at 150th Street – consider full replacement of traffic signal pedestal pole and base on the southwest quadrant, as this pole is very rusty and in need of replacement to extend the useful life of this signal component.

d. Nicollet Avenue at 126th Street – consider full replacement of the aged APS push button system. APS push buttons were installed with the signal system in 2011, are obsolete, and are experiencing more problems that require maintenance and repairs. Note that only the push buttons and cabinet equipment are recommended to be replaced (push button stations remain in good condition).

e. Burnsville Parkway at Upton Avenue Flasher System – the two pedestal poles and bases that hold the RRFBs and solar panels are too short for proper sign height installations and are also in poor condition (either very rusty or very unstable).

f. 140th Street Fire Station Flasher Pole (located east of Burnhaven Drive) – we are not sure if this pole will be maintained with the current construction of the fire station nearby, but if this pole is to be maintained and reused, we recommend that the non-standard 8-inch Yellow indications be replaced with standard 12-inch Yellow indications. The existing W11-8 fire station warning sign is also in fair to poor condition and is recommended to be replaced.

g. Burnsville Parkway at Eagle Ridge Drive Flasher System – signs on all 3 flasher poles are recommended to be installed higher on each pole (at least 7 feet above ground) to protect pedestrians from sharp corners on these signs. Also, the median flasher pole is recommended to have Down Arrow signs installed facing both directions of traffic to match flasher poles on the boulevard installations.

h. Fairview Drive Hospital Flasher System (mid-block system) – the RRFB facing southbound traffic on the left side of the approach is blocked by a street light pole and is recommended to be relocated either onto the street light pole or onto a separate sign post installation north of the street light pole for increased visibility.

4. As mentioned elsewhere in this report, there are several locations where the City could consider interim improvements to add APS push button operation without full replacement of the non-ADA compliant curb ramps. In our field review, we estimated potential locations for APS push button installations that would require minimal sidewalk removal and installation work and allow for this operation until curb ramps are able to be budgeted for full replacement. The "Retrofit/Add APS PB (w/Limited Ramp Work)" column of the "Signals-Miscellaneous Items" spreadsheet lists estimated costs for APS upgrades that could be completed with limited sidewalk construction. As we noted, this could be considered by the City on City owned signal systems without other agency approvals needed. For any potential work on County or State owned signal systems, we are unsure whether these agencies would allow for interim APS push button improvements without full curb ramp reconstruction but provided an estimated cost for this work should this be acceptable to these agencies on an interim basis.

There are a few locations where we do NOT recommend interim APS push button improvements due to poor curb ramp conditions or very limited locations for push button placements. These locations include the intersections of Nicollet Avenue/ Nicollet Boulevard, County Road 5/150th Street, County Road 5/Southcross Drive, and County Road 42/Southcross Drive.

5. We have included a cost for curb ramp upgrades to bring intersections up to full ADA compliance on the "Signals-Miscellaneous Items" spreadsheet. We noted that 10 of the 35 City owned signal/flasher locations are in need of curb ramp upgrades. This was also the case on 11 of the 29 County owned signal system locations and on 3 of the 18 State owned signal system locations. Overall, 24 of the 82 signal/flasher locations were deemed as needing curb ramp upgrades to be fully ADA compliant.

6. One other item of note that the City should include in any budgeting for enhanced traffic control at unsignalized intersections – the City's Multi-Modal Study and Complete Streets Policy (adopted by the City in 2021) has identified several locations throughout the City where pedestrian and bicycle crossing improvements may be warranted. These key crossing locations "connect existing and planned active transportation facilities, allow transit riders to reach bus stops, and reduce out-of-direction travel for walking and biking." A copy of the "Active Transportation Network Implementation Pathways" figure from the Multi-Modal study is included elsewhere in this report to highlight several locations where these types of improvements could be considered by the City over the next several years.

Improvements at unsignalized locations could include ADA compliant curb ramps, pedestrian hybrid beacons, RRFBs, and other geometric modifications. While specific locations for these types of improvements are still being studied by the City for implementation over the next several years, it is reasonable for the City to consider budgeting for additional RRFB system installations as part of any crossing improvements. A typical RRFB installation (including curb ramp upgrades to make the crossing ADA compliant) can cost anywhere from $30,000 for a basic RRFB system to nearly $100,000 for an RRFB system with curb ramp upgrades on both sides of the roadway (and possibly on a center median).

For budgeting purposes, the City may want to consider planning for 1-2 of these types of improvements per year. Assuming that this work would include both an RRFB installation and curb ramp upgrades to each quadrant of the crossing, this would result in an estimated construction cost of $200,000 per year to complete 2 full installations. It can be noted that these types of systems are good candidates for State and Federal funding (through Safe Routes to School funding, Highway Safety Improvement Program, Local Partnership Program, or other available State funding programs), and thus the City may be able to complete these types of improvements for only a fraction of these costs being City budgeted. However, to account for these types of improvements, we recommend considering these costs with overall traffic control improvements budgeting.

PROJECT PRIORITIZATION

The City of Burnsville prioritizes work at traffic signals based on a combination of age, condition, accessibility compliance, and coordination with external agencies. Signals approaching or exceeding their 30 to 40 year service life are assessed for replacement, with higher priority given to those showing structural wear, outdated technology, or frequent maintenance needs. Americans With Disabilities Act and Public Right-of-Way Accessibility Guidelines compliance, particularly related to curb ramps and Accessible Pedestrian Signals, is factored into prioritization, especially where pedestrian volumes are high or accessibility deficiencies are evident. Interim improvements, such as adding APS without full ramp reconstruction, are considered to address urgent needs within budget constraints. The city also aligns its signal upgrades with planned city projects, Dakota County and MnDOT replacement schedules to leverage cost-sharing opportunities and minimize redundant work, as outlined in its Capital Improvement Plan and ADA Transition Plan.

RECOMMENDATIONS

Overall, we estimate the following costs for performing all recommended work over the next two (2) City CIP periods (2023-2027 and 2028-2032):

- Full signal replacement - $6,315,833. This includes replacement of 3 City signal systems, 13 County signal systems, and 6 full/partial replacements on 6 State signal systems.
- Signal Painting - $439,000. This includes repainting 18 City, 19 County, and 9 State signal systems over the next 10 years. Standardize signal color for city-owned signals and consider painting county and state signals the same color if budget allows.
- Miscellaneous Signal Items - $965,500.
- Curb Ramp Upgrades to ADA Compliance - $2,800,000. This includes upgrades at 9 City, 9 County, and 3 State signal systems over the next 10 years.
- RRFB Improvements at 2 Locations per Year - $1,000,000. This includes RRFB system installation and curb ramp improvements at each location.
- Overall 10 year estimated cost - $12,520,333

We understand that the City may not be able to secure this amount of funding for all of the work noted above and can work with the City to prioritize locations where work is strongly recommended to be completed to maintain the City's overall signal infrastructure.

Full signal replacement costs will become clearer once the State and County are able to formalize their replacement schedule for signals noted in this analysis, and we continue to recommend that the City budget for full replacement of 1-2 City owned signal systems within each 5 year CIP to ensure that aged systems are upgraded and replaced on a regular basis.

Signal painting could be staggered further at some locations but there are a number of systems that are in poor condition and need repainting to maintain signal poles for several years before replacement is needed.

Several of the miscellaneous signal items work can also be staggered further or included as part of impending road and intersection projects to utilize State Aid or Federal Aid funding where possible.

Curb ramp replacement work is also likely to be included as part of larger City street improvement projects. Where no work is planned for 10 years or more, we recommend that the City consider having curb ramps upgraded sooner to provide for improved pedestrian facilities.

FIGURES

To summarize overall condition of signal and flasher systems throughout the City, see GIS Figures 1-8.

Figure 1 – summarizes the type and ownership of traffic control types in the City.

Figure 2 – summarizes paint condition and repainting recommendations.

Of note - 10 City systems, 15 County systems, and 6 State systems are recommended to be repainted in the next 3-5 years. This includes 1 City and 2 State systems that are also recommended for/programmed for full replacement in the next 3-5 years.

An additional 9 City systems, 4 County systems, and 5 State systems are recommended to be repainted in the next 5-7 years.

Figure 3 – summarizes ADA curb ramp compliance at signal/ RRFB locations.

Of note – 24 of 82 signal/flasher systems are in need of ADA upgrades.

Figure 4 – summarizes APS push button locations and where retrofits to add APS push button on an interim basis are possible.

Of note – APS push button systems exist at 46 systems, and another 26 locations were deemed as potential locations for interim APS improvements. 4 locations were deemed as poor candidates for interim APS improvements due to geometric concerns.

Figure 5 – summarizes Countdown Timer pedestrian indication locations.

Of note – 8 City, 5 County (including 2 locations with imminent signal replacement estimated) and 2 State signal systems are lacking Countdown Timer pedestrian indications.

Figure 6 – summarizes signal system with and without flashing yellow arrow operations.

Of note – 39 of 67 signal systems throughout the City do not have flashing yellow arrow operations including 14 City, 13 County, and 12 State owned signals.

Figure 7 – summarizes locations with and without LED street lighting.

Of note – 25 of 68 signal systems in the City do not have LED street lighting including 1 City, 19 County (including 2 signals deemed imminent for full replacement) and 5 State owned signals.

Figure 8 – summarizes estimated schedule for full replacement of signal/flasher systems.

FIGURE 1: TRAFFIC CONTROL TYPES

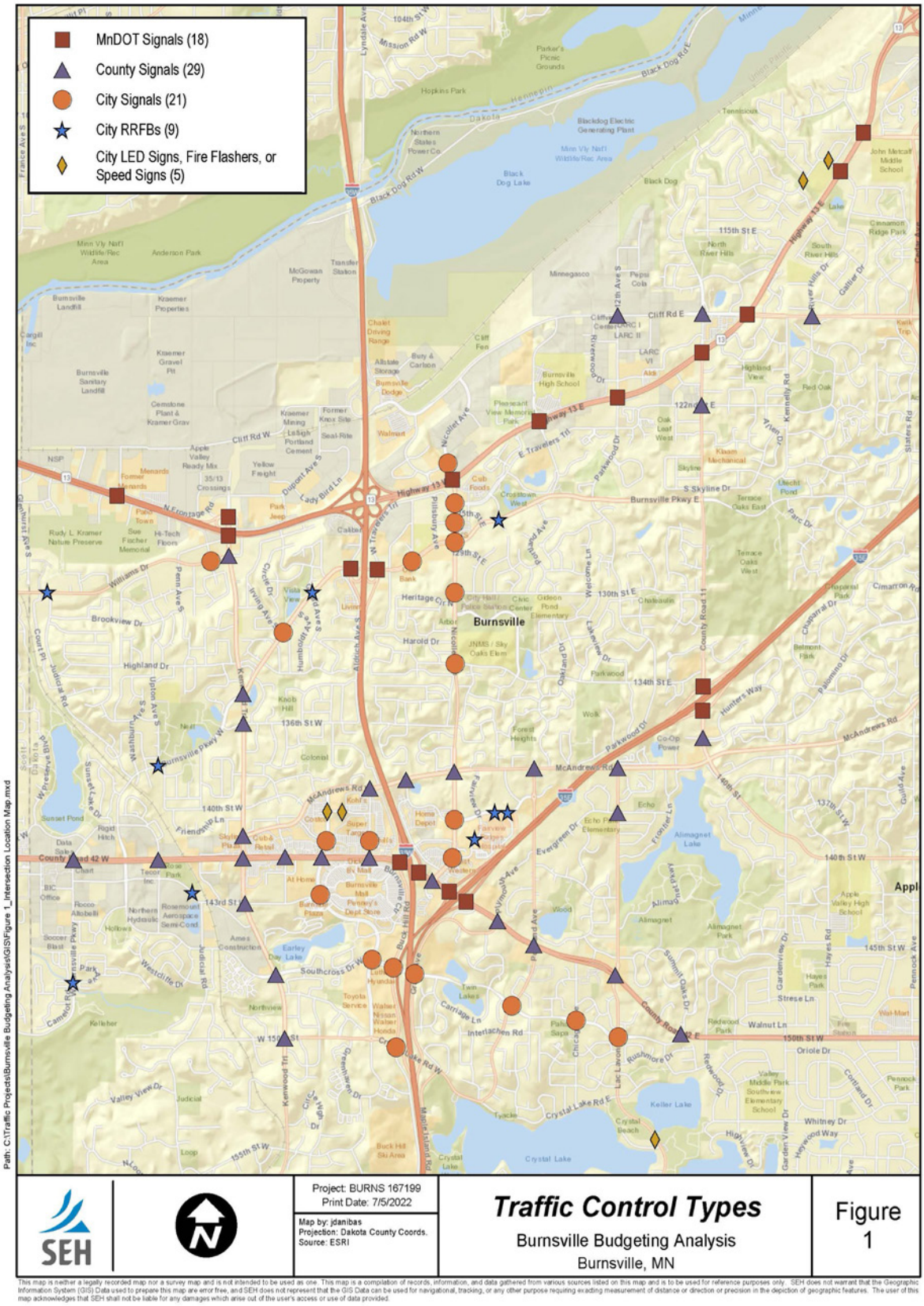
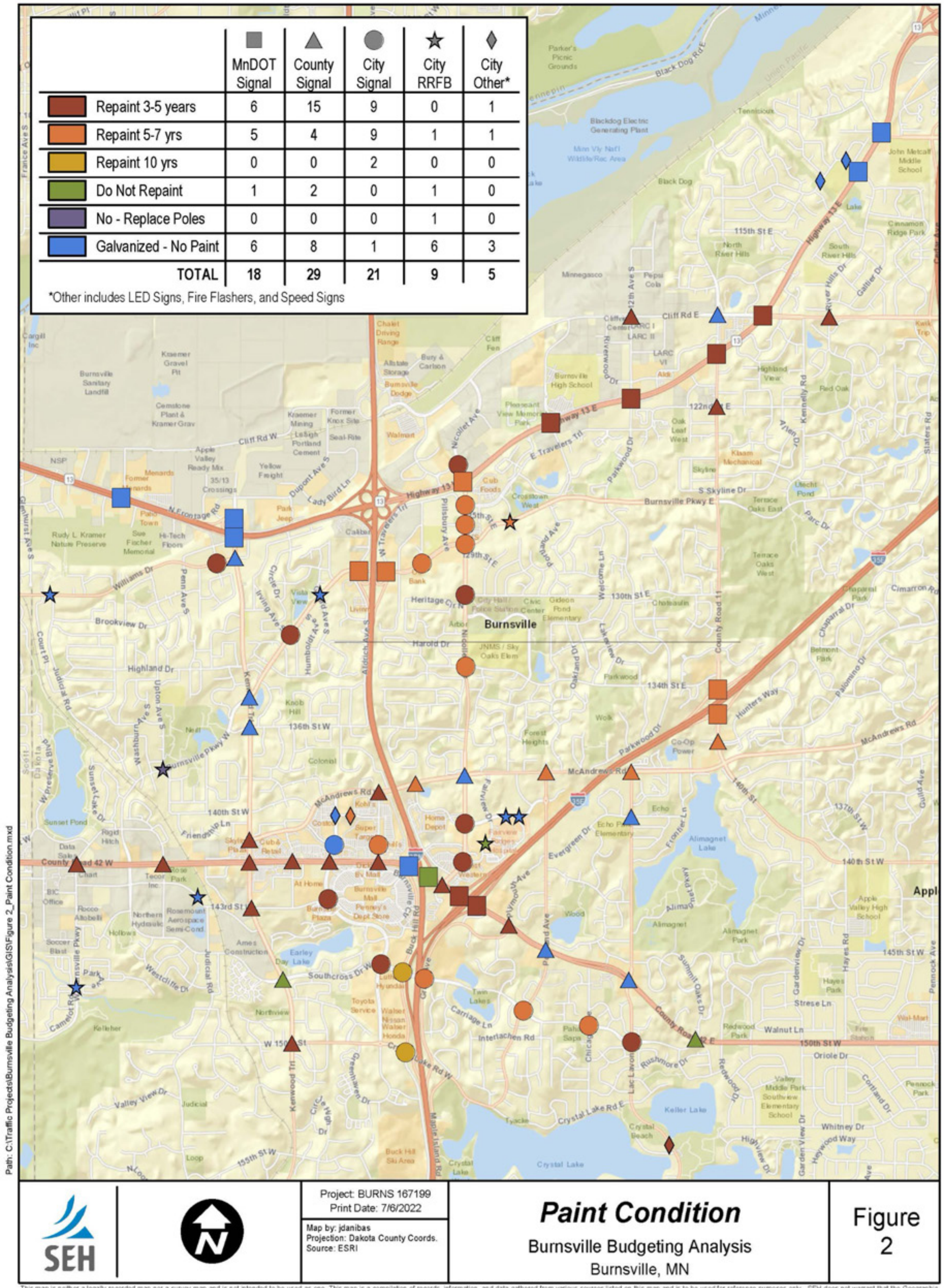


FIGURE 2: PAINT CONDITION



	MnDOT Signal	County Signal	City Signal	City RRFB	City Other*
Repaint 3-5 years	6	15	9	0	1
Repaint 5-7 yrs	5	4	9	1	1
Repaint 10 yrs	0	0	2	0	0
Do Not Repaint	1	2	0	1	0
No - Replace Poles	0	0	0	1	0
Galvanized - No Paint	6	8	1	6	3
TOTAL	18	29	21	9	5

*Other includes LED Signs, Fire Flashers, and Speed Signs

This map is neither a legally recorded map nor a survey map and is not intended to be used as one. This map is a compilation of records, information, and data gathered from various sources listed on this map and is to be used for reference purposes only. SEH does not warrant that the Geographic Information System (GIS) Data used to prepare this map are error free, and SEH does not represent that the GIS Data can be used for navigational, tracking, or any other purpose requiring exacting measurement of distance or direction or precision in the depiction of geographic features. The user of this map acknowledges that SEH shall not be liable for any damages which arise out of the user's access or use of data provided.

FIGURE 3: CURB RAMP COMPLIANCE

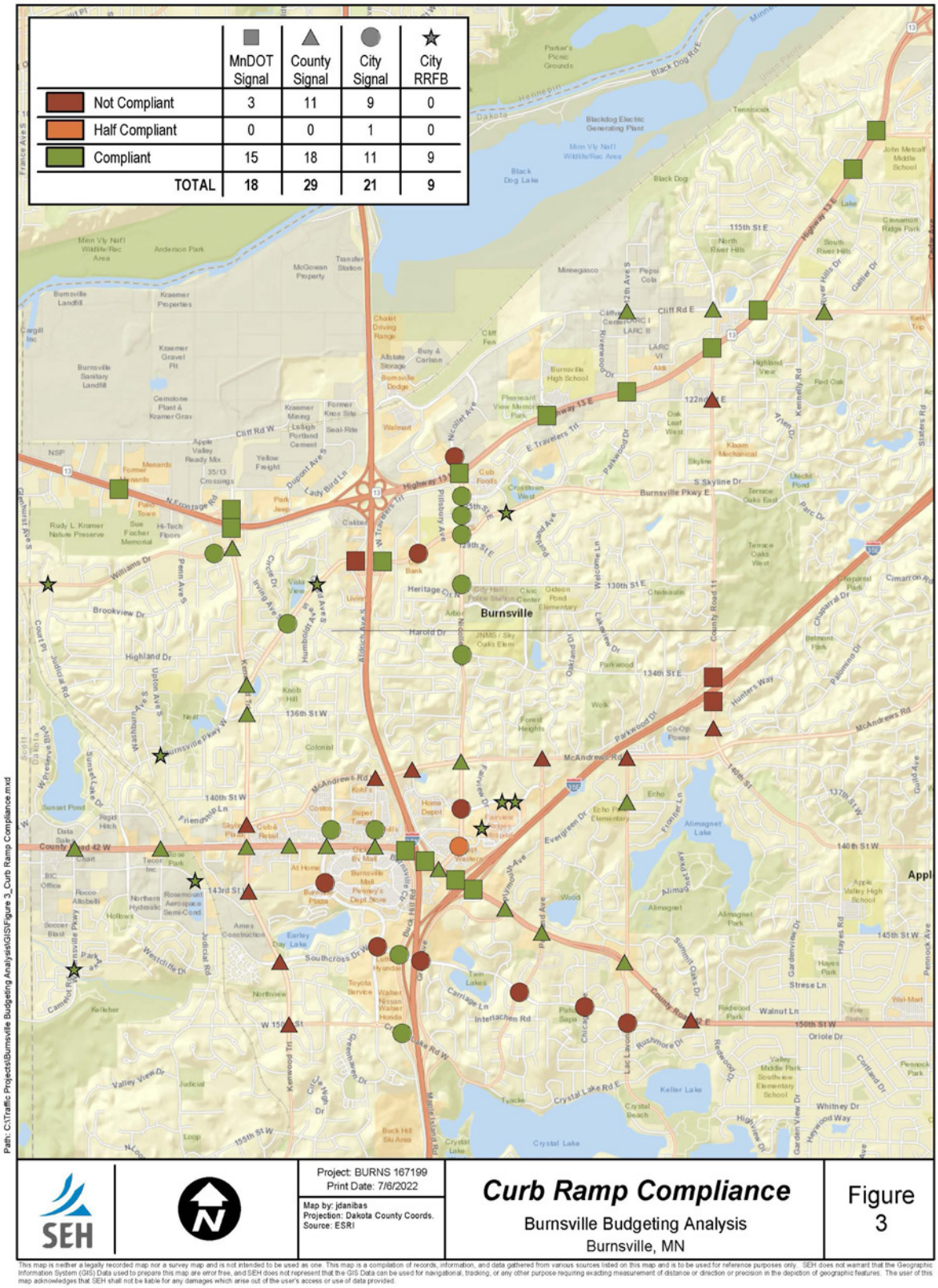


FIGURE 4: APS PUSH BUTTONS

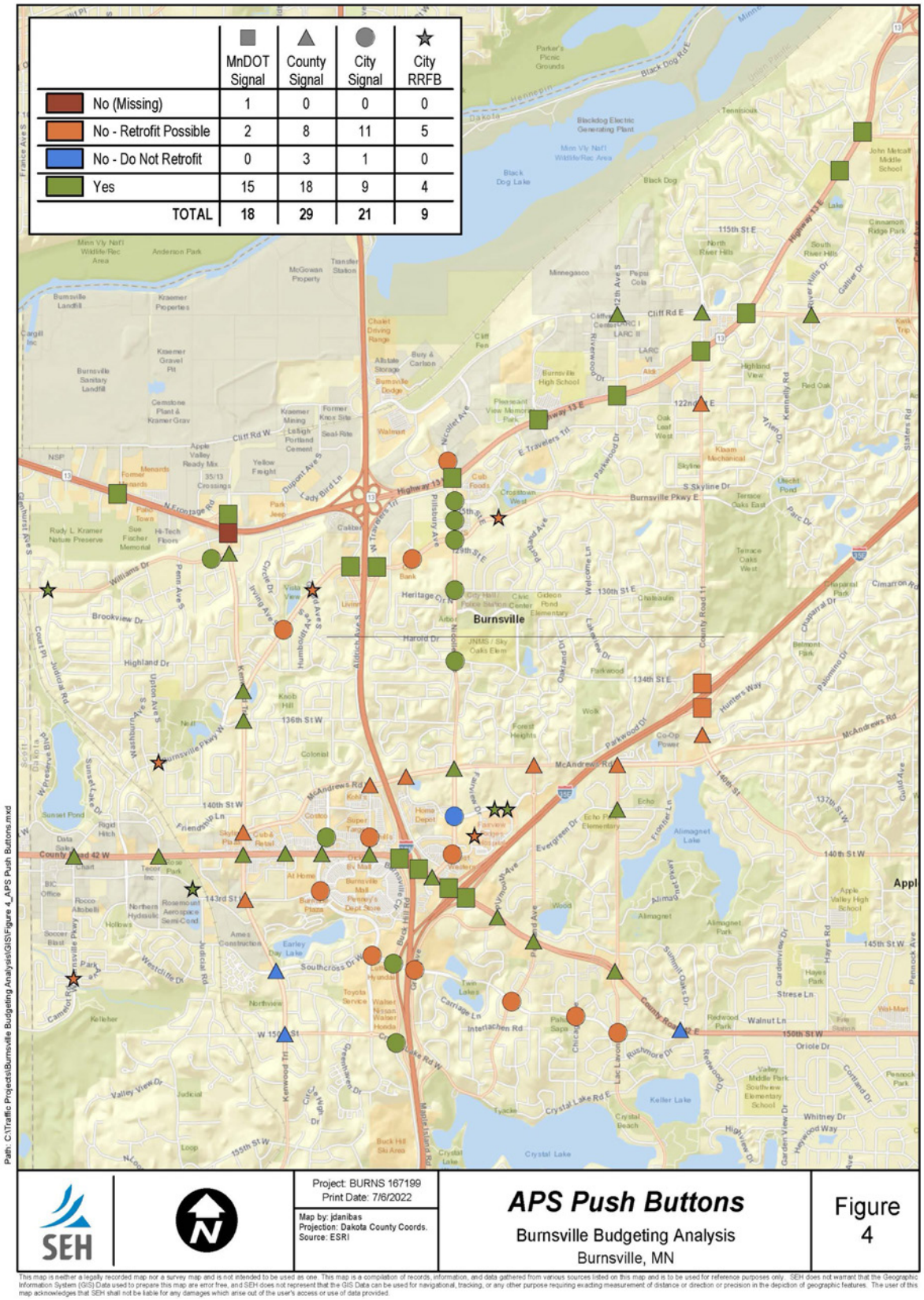


FIGURE 5: COUNTDOWN TIMERS

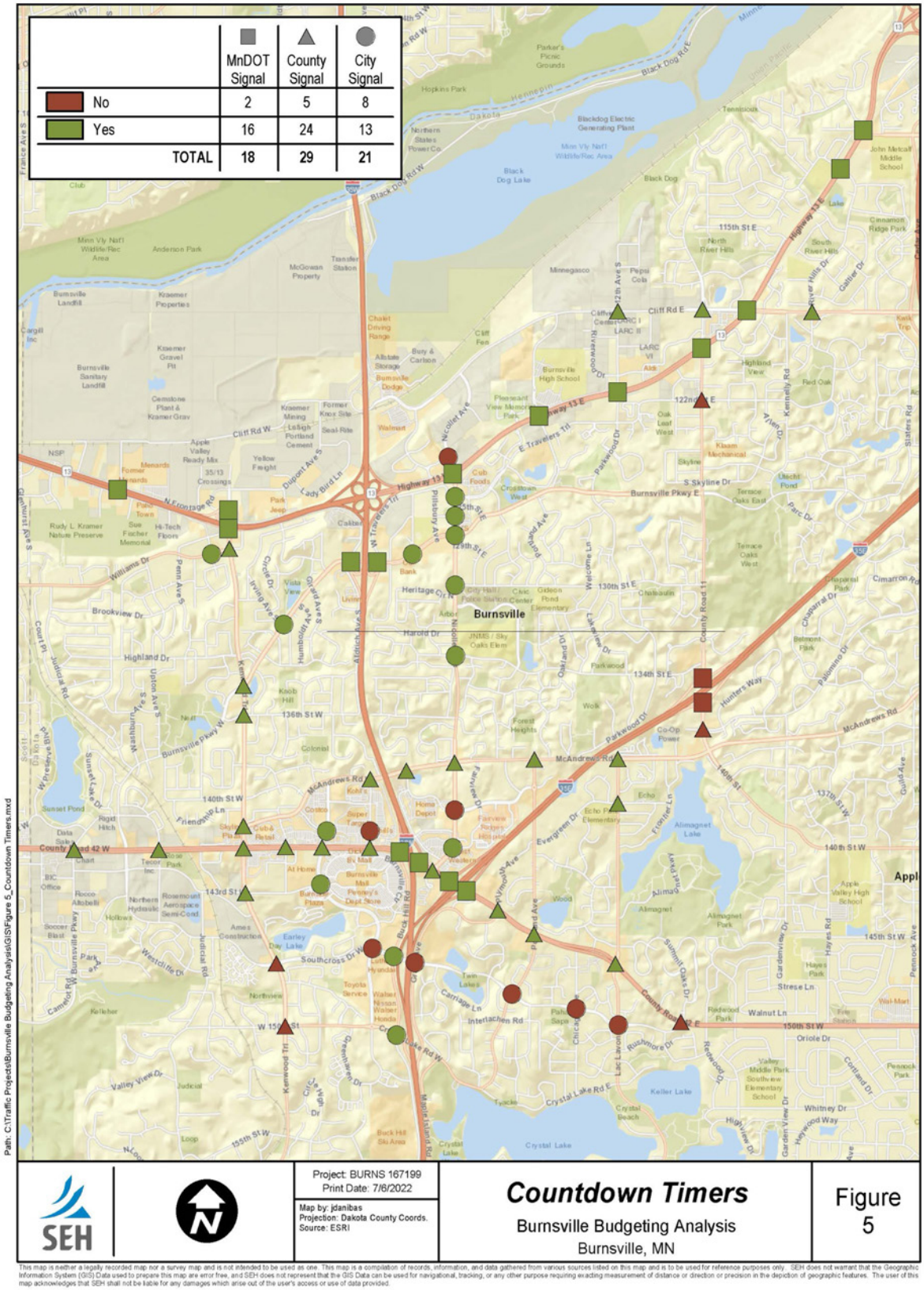


FIGURE 6: FLASHING YELLOW ARROW

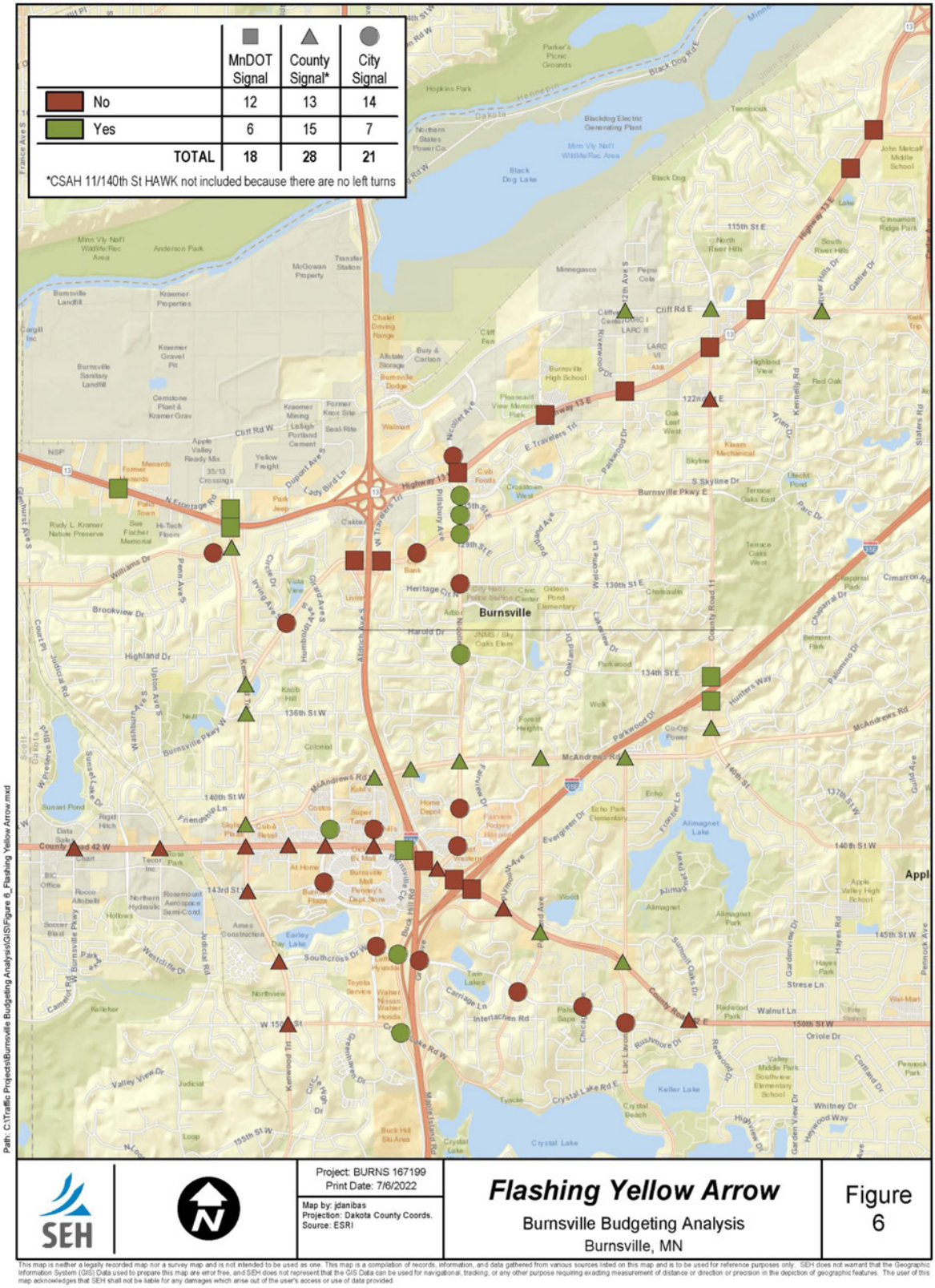


FIGURE 7: LED SIGNAL LIGHTS

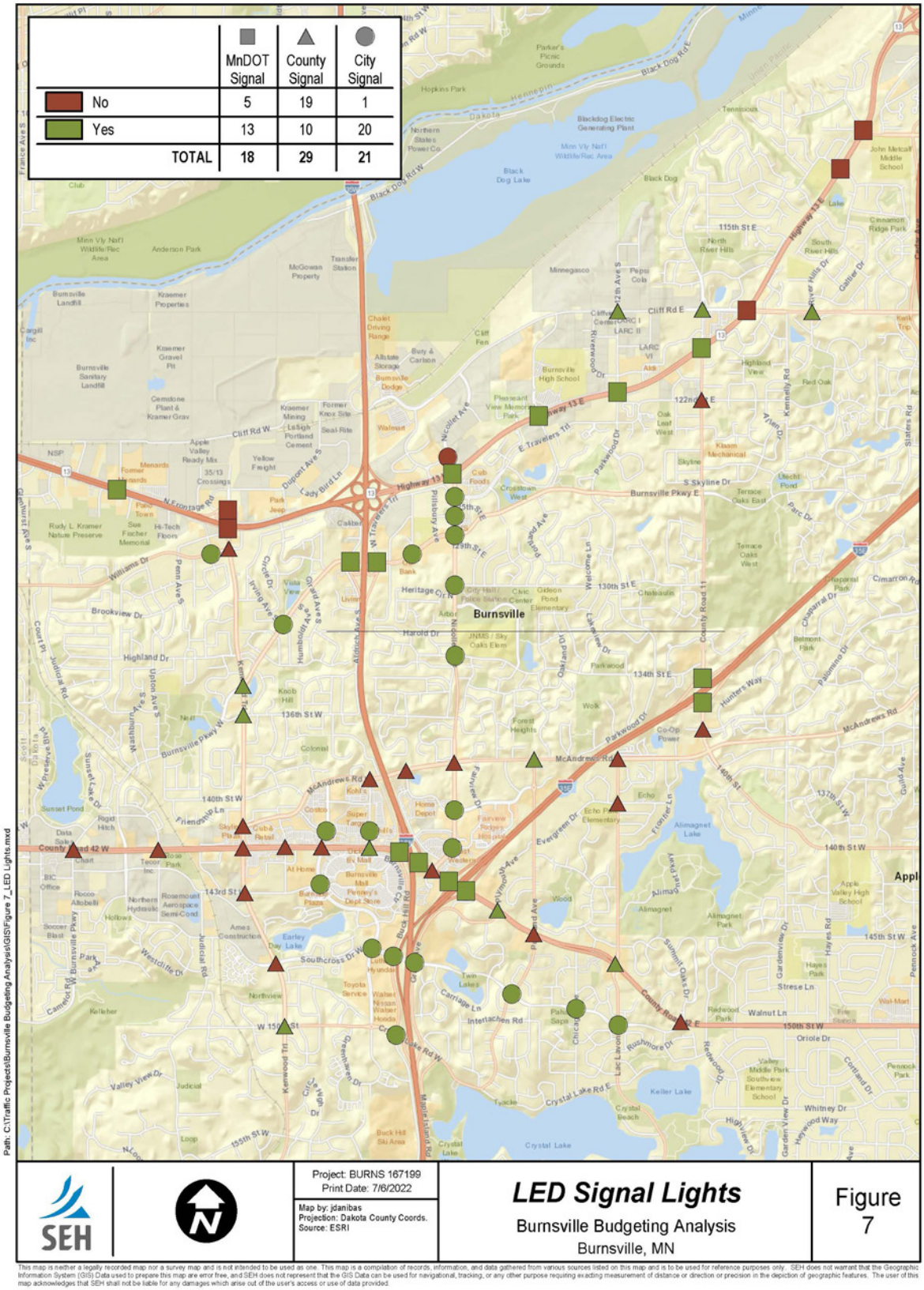
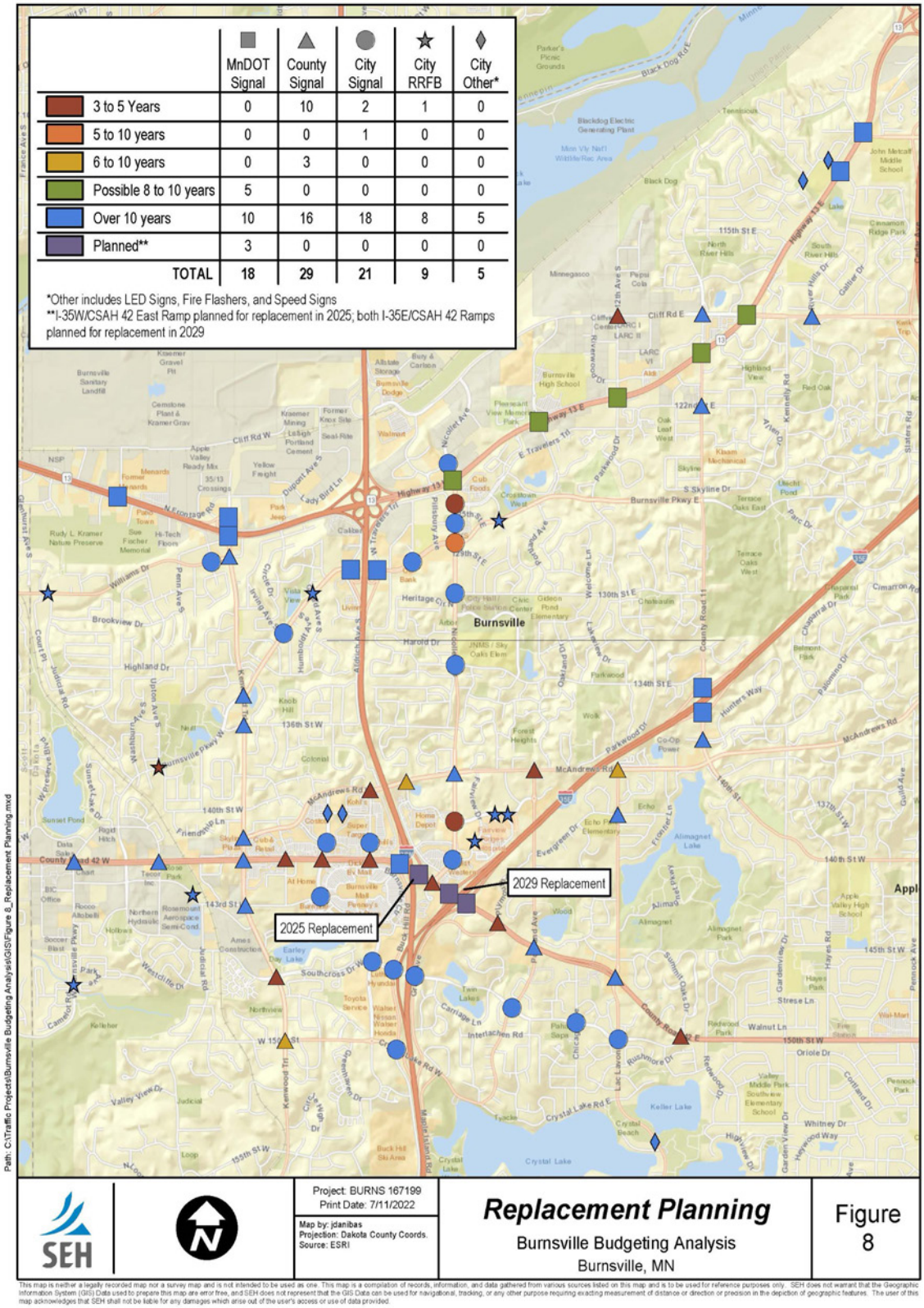


FIGURE 8: REPLACEMENT PLANNING




City of Burnsville
Dakota County Technical College
LEFT LANE
MUST
TURN LEFT

DAKOTA COUNTY OWNED SIGNALIZED INTERSECTIONS:

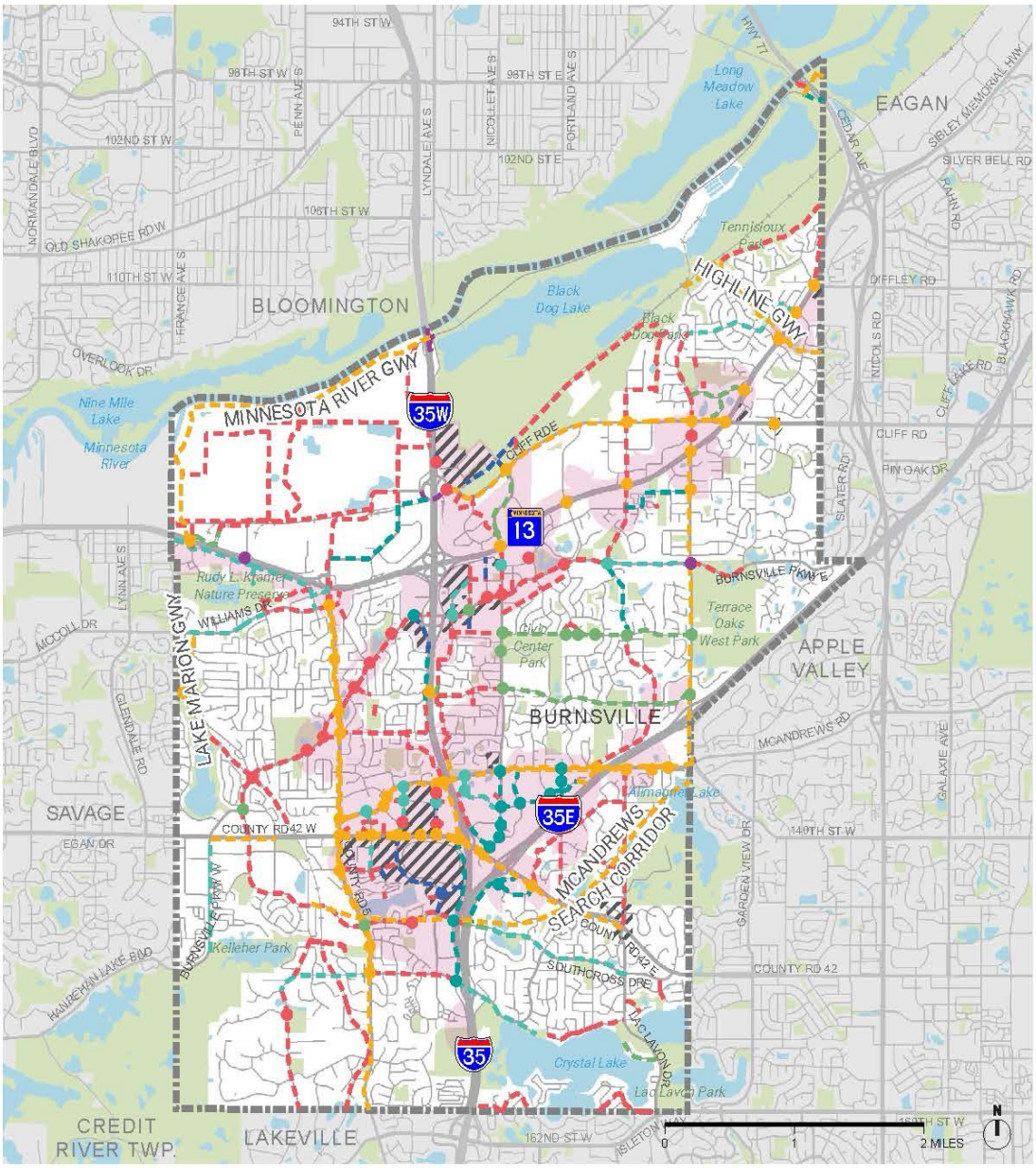
Rank By Age Of All County Signals	Location	City	Original Turn-On Date	Date Of Full Reconstruct	Age Of Signal
2	CSAH 11 & Burnsville Pkwy	BURNS	10/10/1986	1986	36
5	CSAH 42 & Southcross Dr	BURNS	6/30/1989	1989	33
9	CSAH 42 & Irving Ave**	BURNS	10/22/1990	1990	32
10	CSAH (32 Ciff Rd) & 12th Ave	BURNS	6/15/1990	1990	32
11	CSAH 42 & Burnhaven Dr	BURNS	9/4/1990	1990	32
12	CSAH 38 (McAndrews Rd) & Portland Ave	BURNS	4/26/1990	1990	32
13	CSAH 42 & Aldrich Ave**	BURNS	10/9/1990	1990	32
14	CSAH 42 & Nicollet Ave	BURNS	10/23/1990	1990	32
19	CSAH 5 & Southcross Dr	BURNS	8/29/1990	1990	32
20	CSAH 38 (McAndrews Rd) & Aldrich Ave	BURNS	8/1/1991	1991	31
21	CSAH 42 & Plymouth Ave**	BURNS	10/30/1991	1991	31
35	CSAH 5 & 150th St	BURNS	10/26/1995	1995	27
37	CSAH 38 (McAndrews Rd) & CSAH 11 W Jct	BURNS	12/18/1996	1996	26
47	CSAH 38 (McAndrews Rd) & Nicollet Bivd	BURNS	10/24/1997	1997	25
67	CSAH 11 & Palomino Dr / 127th St	AV / BURNS	12/27/2001	2001	21
70	CSAH 32 (Cliff Rd) & E River Hills Dr	BURNS	5/26/2001	2001	21
72	CSAH 11 & 122nd St	BURNS	12/27/2001	2001	21
74	CSAH 5 & 143rd St	BURNS	8/24/2001	2001	21
95	CSAH 42 & Burnsville Pkwy	BURNS	1/1/2009	2009	13
96	CSAH 42 & Judicial Rd	BURNS	1/1/2009	2009	13
98	CSAH 42 & CSAH 5	BURNS	1/1/2009	2009	13
99	CSAH 5 & CSAH 38 (McAndrews Rd)	BURNS	1/1/2009	2009	13
107	CSAH 42 & CSAH 11 / Lac Lavon Dr	BURNS	9/30/2012	2012	10
108	CSAH 42 & Portland Ave	BURNS	9/13/2012	2012	10
113	CSAH 38 (McAndrews Rd) & Nicollet Ave	BURNS	8/5/2013	2013	9
115	CSAH 5 & Williams Dr	BURNS	8/1/2013	2013	9
131	CSAH 32 (Cliff Rd) & W River Hills Dr	BURNS	2/11/2020	2020	3
132	CSAH 5 & 136th St	BURNS	7/23/2019	2019	3
133	CSAH 5 & Burnsville Pkwy	BURNS	7/29/2019	2019	3
N/A	CSAH 11 & 140th St / Evergreen Dr (HAWK)	BURNS	8/16/2013	2013	9

IN BURNSVILLE

Past Upgrades	Proj# Of Past Upgrade	Planned Upgrades	Proj# Of Planned Upgrade
Minor revisions - heads, det's (2002)	11.19	Signal being replaced with roundabout. In design	CP 11-27
ASC3, TS2. ATMS: 2012	42-119	Potential Full Replacement 2023-2027 CIP	TBD
ASC3, TS2. ATMS, 2012	42.119	Potential Full Replacement 2023-2027 CIP**	TBD
FYA, ASC3, TS2 ATMS: 2020		Potential Full Replacement 2023-2027 CIP	TBD
ASC3. TS2 ATMS, PTZ: 2012	42.119	Potential Full Replacement 2023-2027 CIP	TBD
CMAQ 38-58	38-16	Potential Full Replacement 2023-2027 CIP	TBD
ASC3, TS2. ATMS, PTZ: 2012	42-119	Potential Full Replacement 2023-2027 CIP**	TBD
ASC3. TS2. ATMS, PTZ. 2012	42-119	Potential Full Replacement 2023-2027 CIP	TBD
	5.20	Potential Full Replacement 2023-2027 CIP	TBD
	38-17	Potential Full Replacement 2023-2027 CIP	TBD
ASC3, TS2. ATMS, 2012	42.119	Potential Full Replacement 2023-2027 CIP**	TBD
	5.26		
	11-10	Add FYA, PTZ, cobalt & cabinet	2022/23 CMAQ CP 38-58
	38-24	Add FYA, PTZ, cobalt & cabinet	2022/23 CMAQ CP 38-58
	11-18	Add FYA, cobalt & cabinet	2022/23 CP 11-29
FYA, ASC3, TS2. ATMS, 2020			
5 section PPLT heads	11-12		
	5.34		
12/16/1987	42-91		
12/16/1987	42-91		
ASC3, TS2 ATMS 2012	42-119		
	42-91	Add FYA, RT OVL, PTZ	2022/23 CMAQ CP 38-58
		Add PTZ	2022/23 CMAC CP 38-58

FIGURE 39: ACTIVE TRANSPORTATION NETWORK IMPLEMENTATION PATHWAYS

Figure 39. Active Transportation Network Implementation Pathways



IMPLEMENTATION

CITY OF BURNSVILLE
MULTI-MODAL STUDY AND
COMPLETE STREETS POLICY

CROSSING IMPROVEMENTS

- MnDOT or County Project Planned
- Needs Consideration by City & County/MnDOT
- Needs Consideration by City
- Redevelopment
- Reconstruction or Rehabilitation 2022-2024
- Reconstruction or Rehabilitation - 2025-2029
- Reconstruction or Rehabilitation - 2030s

LINEAR FACILITY IMPROVEMENTS

- MnDOT or County Project Planned
- Needs Consideration by City & County/MnDOT
- Needs Consideration by City
- Redevelopment
- Reconstruction or Rehabilitation - 2022-2024
- Reconstruction or Rehabilitation - 2025-2029
- Reconstruction or Rehabilitation - 2030s

KEY AREAS

- Redevelopment
- Priority Area

ESTIMATED COSTS

	Signal System Costs for:	Estimated Costs 2023-2027	Estimated Costs 2028-2032	Estimated Costs > 10 Years
1	Replacement	$4,082,500	$2,233,333	$0
2	Painting	$267,000	$172,000	$25,000
3	Miscellaneous Items	$482,750	$482,750	0
4	Curb Ramp Upgrades	$1,400,000	$1,400,000	0
5	RRFB Improvements	$1,000,000	$1,000,000	0
	Estimated Costs Per Period	$7,232,250	$5,288,083	$25,000

SIGNALS: REPLACEMENT BUDGET

City Owned Signals/Flashers	Date Installed	Replacement Cost 2023-2027	Replacement Cost 2028-2032	Signal Replacement > 10 YRS
Nicollet Ave/Burnsville Pkwy	1973		$550,000	
Nicollet Ave/Travelers Trail	1987	$500,000		
Burnhaven Dr/ 143rd Street	1988			X
Burns. Pkwy/Irving Ave	1980			X
Nicollet Ave/130th Street	1991			X
Nicollet Ave/MVTA Park & Ride	1995			X
Buck Hill Rd/Southcross Dr	1996			X
Southcross Dr/Grand Ave	1996			X
Buck Hill Rd/150th Street	1996			X
Aldrich Ave/Marketplace	1996			X
Nicollet Ave/Nicollet Blvd	1997	$550,000		
Southcross Dr/Portland Ave	1997			X
Southcross Dr/Chicago Ave	1997			X
Southcross Dr/LacLavon Dr	1997			X
Burns. Pkwy/Pleasant Ave	1998			X
Williams Drive/Morgan Avenue	2002			X
Southcross Dr/Burnhaven Dr	2003			X
Nicollet Ave/Cobblestone Ct	2003			X
Burnhaven Dr/141st Street	2010			X
Nicollet Ave/126th Street	2011			X
Nicollet Ave/134th-Woodcrest	2015			X
Burns. Pkwy/Upton Ave Flasher	1999			X
LacLavon Drive Speed Signs	2007			X
Burnhaven Dr/140th St Flashers	2010			X
140th Street Fire Station Flasher	UNKNOWN			X
River Hills/Sioux North Flasher	2012			X
River Hills/Sioux South Flasher	2012			X
Burns Pkwy/Eagle Ridge Flasher	2015			X
Williams/Judicial Road Flasher	2018			X
Burns Pkwy/Girard Flasher	2018			X
Burns Pkwy/Park Flasher	2018			X

SIGNALS: REPLACEMENT BUDGET, CONTINUED...

City Owned Signals/Flashers	Date Installed	Replacement Cost 2023-2027	Replacement Cost 2028-2032	Signal Replacement > 10 YRS
Fairview Drive (hospital) Flasher	2019			X
Judicial Rd Flasher (near Rose Park)	2020			X
Nicollet Blvd West Hospital Flasher	2022			X
Nicollet Blvd East Hospital Flasher	2022			X
Estimated Costs Per Period		$1,050,000	$550,000	$550,000

Dakota County Owned	Date Installed	Replacement Cost 2023-2027	Replacement Cost 2028-2032	Signal Replacement > 10 YRS
CSAH 42/Southcross-Summit	1989	$300,000		
CSAH 5/Southcross Drive	1990	$300,000		
CSAH 32/12th Avenue	1990	$300,000		
CSAH 38/Portland Avenue	1990	$300,000		
CSAH 42/Nicollet Avenue	1990	$300,000		
CSAH 42/Aldrich Avenue	1990	$300,000		
CSAH 42/Irving Avenue	1990	$300,000		
CSAH 42/Burnhaven Drive	1990	$300,000		
CSAH 38/Aldrich Avenue	1991	$200,000		
CSAH 42/Plymouth Avenue	1991	$300,000		
CSAH 5/150th Street	1995		$300,000	
CSAH 11/CSAH 38 West Jct	1996		$150,000	
CSAH 38/Nicollet Blvd.	1997		$183,333	
CSAH 5/143rd Street	2001			X
CSAH 11/122nd Street	2001			X
CSAH 11/Palomino Dr/137th St	2001			X
CSAH 32/East River Hills Dr	2001			X
CSAH 5/CSAH 38 (McAndrews)	2008			X
CSAH 5/CSAH 42	2008			X
CSAH 42/Judicial Road	2008			X
CSAH 42/Burnsville Pkwy	2008			X
CSAH 42/Portland Avenue	2012			X
CSAH 42/CSAH 11-LacLavon	2012			X
CSAH 5/Williams Drive	2013			X
CSAH 38/Nicollet Avenue	2013			X
CSAH 11 at 140th Street HAWK	2013			X
CSAH 5/Burnsville Pkwy	2019			X
CSAH 5/136th Street	2019			X
CSAH 32/West River Hills Dr	2020			X
Estimated Casts Per Period		$2,900,000	$633,333	

SIGNALS: REPLACEMENT BUDGET, CONTINUED...

Mn/DOT State Owned	Date Installed	Replacement Cost 2023-2027	Replacement Cost 2028-2032	Signal Replacement > 10 YR
TH 13/CSAH 32 (Cliff Rd)	1971			
TH 13/Nicollet Ave	1973		$300,000	
TH 13/Parkwood Ave (12th)	1978		$300,000	
I-35 W/CSAH 42 (East)	1980			
TH 13/Portland Ave	1984		$300,000	
TH 13/CSAH 11- River Hills	1986		$150,000	
I-35E /CSAH 42 (East)	1989			
I-35E/CSAH 42 (West)	1989			
I-35E/CSAH 11 (North)	1999			X
I-35E/CSAH 11 (South)	1999			X
TH 13/CSAH 30 (Diffley)	2009			X
TH 13/E River Hills Drive	2009			X
I-35W/Burns. Pkwy (West)	2009	$110,000		X
I-35 W/Burns. Pkwy (East)	2009	$22,500		X
TH 13 at CSAH 5 North Ramps	2013			X
TH 13 at CSAH 5 South Ramps	2013			X
I-35W/42 West-Buck Hill Rd	2017			X
TH 13/Washburn Ave	2017			X
Estimated Costs Per Period		$132,500	$1,050,000	
Total Estimated Costs Each Period		$4,082,500	$2,233,333	

SIGNALS: PAINTING BUDGET

City Owned Signals	Paint in 2023-2027	Paint in 2028-2032	Paint in > 10 YRS	No Need to Paint (galvanized)
Nicollet Ave/Burnsville Pkwy				Replace Signal
Nicollet Ave/Travelers Trail				Replace Signal
Burnhaven Dr/143rd Street	$10,000			
Burns. Pkwy/Irving Ave	$10,000			
Nicollet Ave/130th Street	$8,000			
Nicollet Ave/MVTA Park & Ride	$10,000			
Buck Hill Rd/Southcross Dr			$12,500	
Southcross Dr/Grand Ave		$11,000		
Buck Hill Rd/150th Street			$12,500	
Aldrich Ave/Marketplace		$11,000		
Nicollet Ave/Nicollet Blvd				Replace Signal
Southcross Dr/Portland Ave		$11,000		
Southcross Dr/Chicago Ave		$11,000		
Southcross Dr/LacLavon Dr	$10,000			
Burns. Pkwy/Pleasant Ave		$11,000		
Williams Drive/Morgan Avenue	$10,000			
Southcross Dr/Burnhaven Dr	$10,000			
Nicollet Ave/Cobblestone Ct	$10,000			
Burnhaven Dr/141st Street				X
Nicollet Ave/126th Street		$11,000		
Nicollet Ave/134th-Woodcrest		$11,000		
Burns. Pkwy/Upton Ave Flasher				Replace Poles
LacLavon Drive Speed Signs	$1,000			
Burnhaven Dr/140th St Flashers				X
140th Street Fire Station Flasher		$500		
River Hills/Sioux North Flasher				X
River Hills/Sioux South Flasher				X
Burns. Pkwy/Eagle Ridge Flasher		$1,500		
Williams/Judicial Road Flasher				X
Burns. Pkwy/Girard Flasher				X
Burns. Pkwy/Park Flasher				X
Fairview Drive (hospital) Flasher				Sign Posts
Judicial Rd Flasher (near Rose Park)				X
Nicollet Blvd West Hospital Flasher				X
Nicollet Blvd East Hospital Flasher				X
Estimated Costs Per Period	**$79,000**	**$79,000**	**25,000**	

SIGNALS: PAINTING BUDGET, CONTINUED...

Dakota County Owned	Paint in 2023-2027	Paint in 2028-2032	Paint in > 10 YRS	No Need to Paint (galvanized)
CSAH 42/Southcross-Summit				Signal Replace
CSAH 5/Southcross Drive				Signal Replace
CSAH 32/12th Avenue	$10,000			
CSAH 38/Portland Avenue		$11,000		
CSAH 42/Nicollet Avenue	$10,000			
CSAH 42/ Aldrich Avenue	$10,000			
CSAH 42/Irving Avenue	$10,000			
CSAH 42/Burnhaven Drive	$10,000			
CSAH 38/Aldrich Avenue	58,000			
CSAH 42/Plymouth Avenue	$10,000			
CSAH 5/150th Street	$10.000			
CSAH 11/CSAH 38 West Jct		511,000		
CSAH 38/Nicollet Blvd		$9,000		
CSAH 5/143rd Street	$10,000			
CSAH 11/122nd Street	$10,000			
CSAH 11/Palomino Dr/137th St		$11,000		
CSAH 32/East River Hills Dr	$10,000			
CSAH 5/CSAH 38 (McAndrews)	$10,000			
CSAH 5/CSAH 42	$10,000			
CSAH 42/Judicial Road	$10,000			
CSAH 42/Burnsville Pkwy	$10,000			
CSAH 42/Portland Avenue				X
CSAH 42/CSAH 11-LacLavon				X
CSAH 5/Williams Drive				X
CSAH 38/Nicollet Avenue				X
CSAH 11 at 140th Street HAWK				X
CSAH 5/Burnsville Pkwy				X
CSAH 5/136th Street				X
CSAH 32/West River Hills Dr				X
Estimated Costs Per Periad	$148,000	$42,000	$0	

SIGNALS: PAINTING BUDGET, CONTINUED...

Mn/DOT State Owned	Paint in 2023-2027	Paint in 2028-2032	Paint in > 10 YRS	No Need to Paint (galvanized)
TH 13/CSAH 32(Cliff Rd)	$10,000			
TH 13/Nicollet Ave		$11,000		
TH 13/Parkwood Ave (12 th)	$10,000			
I-35W/CSAH 42 (East)				
TH 13/Portland Ave	$10,000			
TH 13/CSAH 11-River Hills	$10,000			
I-35E /CSAH 42 (East)				
I-35E/CSAH 42 (West)				
I-35E/CSAH 11 (North)		$9,000		
I-35E/CSAH 11 (South)		$9,000		
TH 13/CSAH 30 (Diffley)				X
TH 13/E River Hills Drive				X
I-35W/Burns. Pkwy (West)				
I-35W/Burns. Pkwy (East)				
TH 13 at CSAH 5 North Ramps		$11,000		X
TH 13 at CSAH 5 South Ramps		$11,000		X
I-35W/42 West-Buck Hill Rd				X
TH 13/Washburn Ave				X
Estinated Costs Per Period	$40,000	$51,000	$0	
Total Estimated Costs Each Period	$267,000	$172,000	$25,000	


City Of
Burnsville

SIGNALS: MISCELLANEOUS ITEMS

City Owned Signals/Flashers	Retrofit to Countdown Timers	Retrofit/Add APS PB (w/Limited Ramp Work)	Upgrade to LED Street Lights
Nicollet Ave/ Burnsville Pkwy			
Nicollet Ave/Travelers Trail			
Burnhaven Dr/143rd Street		$30,000	
Burns. Pkwy/Irving Ave		$30,000	
Nicollet Ave/130th Street			
Nicollet Ave/MVTA Park & Ride	$8,000	$20,000	$2,000
Buck Hill Rd/Southcross Dr			
Southcross Dr/Grand Ave	$6,000	$20,000	
Buck Hill Rd/150th Street			
Aldrich Ave/Marketplace	$5,000	$25.000	
Nicollet Ave/Nicollet Blvd			
Southcross Dr/Portland Ave	$8,000	$25,000	
Southcross Dr/ Chicago Ave	$8,000	$25,000	
Southcross Dr/ LacLavon Dr	$5,000	$25,000	
Burns. Pkwy/Pleasant Ave		$30,000	
Williams Drive/Morgan Avenue			
Southcross Dr/ Burnhaven Dr	$5,000	$40,000	
Nicollet Ave/Cobblestone Ct		$30,000	
Burnhaven Dr/141st Street			
Nicollet Ave/126th Street			
Nicollet Ave/134th-Woodcrest			
Burns. Pkwy/Upton Ave Flasher		$6,000	
LacLavon Drive Speed Signs			
Burnhaven Dr/140th St Flashers			
140th Street Fire Station Flasher			
River Hills/Sioux North Flasher			
River Hills/Sioux South Flasher			
Burns Pkwy/Eagle Ridge Flasher			
Williams/Judicial Road Flasher			
Burns Pkwy/Girard Flasher			
Burns Pkwy/Park Flasher			
Fairview Drive (hospital) Flasher		$6,000	
Judicial Rd Flasher (near Rose Park)			
Nicollet Blvd West Hospital Flasher			
Nicollet Blvd East Hospital Flasher			
Estimated Costs Per item	**$45,000**	**$312,000**	**$2,000**

Signal Sign Replace/Add	Service Cabinet Upgrade	Miscellaneous Items	Estimated Signal Costs	Estimated FYA Upgrade	Upgrade Ped Ramps (not including APS)
			$0	$0	
			$0	$0	
	$7,500		$37,500	$50,000	$150,000
		$15,000	$45,000	$55,000	
	$7,500		$7,500	$40,000	
$5,000	$7,500	$25,000	$67,500	$50,000	$100,000
	$7,500		$7,500	$0	
$5,000	$7,500		$38,500	$50,000	$125,000
	$7,500	$3,500	$11,000	$0	
$2,500	$7,500		$40,000	$50,000	
			$0	$0	
	$7,500		$40,500	$80,000	$125,000
	$7,500		$40,500	$50,000	$125,000
	$7,500		$37,500	$60,000	$125,000
	$7,500		$37,500	$50,000	$150,000
	$7,500		$7,500	$15,000	
$5,000	$7,500		$57,500	$60,000	$180,000
	$7,500		$37,500	$60,000	$60,000
$5,000			$5,000	$20,000	
		$8,000	$8,000	$0	
			$0	$0	
		$4,000	$10,000		
			$0		
			$0		
		$2,000	$2,000		
			$0		
			$0		
		$4,500	$4,500		
			$0		
			$0		
			$0		
		$2,000	$8,000		
			$0		
			$0		
			$0		
$22,500	$105,000	$64,000	$550,500	$690,000	$1,140,000

SIGNALS: MISCELLANEOUS ITEMS, CONTINUED...

Dakota County Owned	Retrofit to Countdown Timers	Upgrade to LED Street Lights	Retrofit/Add APS PB (w/Limited Ramp Work)	Signal Sign Replace/Add
CSAH 42/Southcross-Summit				
CSAH 5/Southcross Drive				
CSAH 32/12th Avenue				
CSAH 38/Portland Avenue			$30,000	
CSAH 42/Nicollet Avenue		$4,000		
CSAH 42/Aldrich Avenue				
CSAH 42/Irving Avenue		$2,000		
CSAH 42/Burnhaven Drive		$4,000		
CSAH 38/Aldrich Avenue		$2,000	$25,000	
CSAH 42/Plymouth Avenue				
CSAH 5/150th Street	$5,000		$25,000	
CSAH 11/CSAH 38 West Jct		$2,000	$25,000	
CSAH 38/Nicollet Blvd.		$2,000	$25,000	
CSAH 5/143rd Street		$2,000	$25,000	
CSAH 11/122nd Street	$5,000	$2,000	$30,000	
CSAH 11/Palomino Dr/137th St.	$5,000	$2,000	$30,000	
CSAH 32/E. River Hills Dr.				
CSAH 5/CSAH 38 (McAndrews)		$2,000	$30,000	$5,000
CSAH 5/CSAH 42		$4,000		$5,000
CSAH 42/Judicial Road		$4,000		$5,000
CSAH 42/Burnsville Pkwy		$4,000		$5,000
CSAH 42/Portland Avenue		$4,000		
CSAH 42/CSAH 11-LacLavon				
CSAH 5/Williams Drive		$4,000		$5,000
CSAH 38/Nicollet Avenue		$4,000		
CSAH 11 at 140th Street HAWK		$2,000		
CSAH 5/Burnsville Pkwy				
CSAH 5/136th Street				
CSAH 32/W. River Hills Dr.				
Estimated Costs Per Item	$15,000	$50,000	$245,000	$25,000

Service Cabinet Upgrade	Miscellaneous Items	Estimated Signal Costs	Estimated FYA Upgrade	Upgrade Ped Ramps (not including APS)
		$0		
		$0		
		$0		
		$30,000		$125,000
		$4,000		
		$0		
		$2,000		
		$4,000		
		$27,000		$175,000
		$0		
		$30,000		$175,000
		$27,000		$125,000
		$27,000		$125,000
		$27,000		$125,000
		$37,000		$125,000
		$37,000		$150,000
		$37,000		
		$9,000		$150,000
		$9,000		
		$9,000		
		$4,000		
		$0		
		$0		
		$9,000		
		$4,000		
		$2,000		
		$0		
		$0		
		$0		
$0	$0	$335,000	$0	$1,275,000

SIGNALS: MISCELLANEOUS ITEMS, CONTINUED...

Mn/DOT State Owned	Retrofit to Countdown Timers	Retrofit/Add APS PB (w/Limited Ramp Work)	Upgrade to LED Street Lights	Service Cabinet Upgrade
TH 13/CSAH 32 (Cliff Rd)			$2,000	
TH 13/Nicollet Ave				
TH 13/Parkwood Ave (12th)				
I-35W/CSAH 42 (East)				
TH 13/Portland Ave				
TH 13/CSAH 11-River Hills				
I-35E/CSAH 42 (East)				
I-35E/CSAH 42 (West)				
I-35E/CSAH 11 (North)	$3,000	$20,000		
I-35E/CSAH 11 (South)	$3,000	$20,000		
TH 13/CSAH 30 (Diffley)			$4,000	
TH 13/E River Hills Drive			$2,000	
I-35W/Burns. Pkwy (West)		$20,000		
I-35W/Burns. Pkwy (East)				
TH 13 at CSAH 5 North Ramps			$4,000	
TH 13 at CSAH 5 South Ramps			$2,000	
I-35W/42 West-Buck Hill Rd				
TH 13/Washburn Ave				
Estimated Costs Per Item	**$6,000**	**$60,000**	**$14,000**	**$0**
Total Estimated Costs Each Item	**$66,000**	**$617,000**	**$66,000**	**$105,000**

Signal Sign Replace/Add	Miscellaneous Items	Estimated Signal Costs	Estimated FYA Upgrade	Upgrade Ped Ramps (not including APS)
		$2,000		
		$0		
		$0		
		$0		
		$0		
		$0		
		$0		
		$0		
		$23,000		$130,000
		$23,000		$130,000
		$4,000		
		$2,000		
		$20,000		$125,000
		$0		
		$4,000		
		$2,000		
		$0		
		$0		
$0	$0	$80,000	$0	$385,000
$47,500	$64,000	$965,500	$690,000	$2,800,000

City Of Burnsville

SEH