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Draft Memorandum

SRF No. 10536.00

To: Jason Wedel, PE, Public Works Director/City Engineer
City of Prior Lake

From: Matt Pacyna, PE, Principal
Emily Gross, PE, Senior Engineer

Date: October 12, 2017

Subject: CH 21 Downtown Prior Lake Reconstruction – Local Transportation Assessment

Introduction

The City of Prior Lake selected SRF to provide traffic engineering services pertaining to local impacts with the planned County Highway 21 Downtown Prior Lake Reconstruction and associated alternative development process (see Figure 1: Project Location). SRF has been involved with the project management team (PMT) throughout the study process, providing input, reviewing technical results, and attending various public meetings. SRF has reviewed the draft *Existing Traffic Conditions Memorandum* (September 25, 2017) and the *Future Traffic Conditions Memorandum* (October 4, 2017) completed by Bolton & Menk. However, these documents focus on operations along CH 21 and do not provide a comprehensive local transportation assessment. Therefore, SRF conducted a supplemental local transportation assessment to better understand how CH 21 alternatives would be expected to impact the local transportation system. The following information provides a summary of the proposed alternatives evaluation and the associated impacts to the local transportation system.

Project Goals

The PMT developed project goals early in the project process. Those goals are as follows:

A) ***Character***: Preserve and enrich the character of Downtown Prior Lake

B) ***Non-Motorized***: Provide a comprehensive network for nonmotorized transportation that is compatible with the major transportation corridors

C) **Safety:** Safely accommodate all users along the major transportation corridors

D) ***Mobility:*** Enhance vehicle mobility on major transportation corridors

E) ***Local***: Maintain and enhance local roadway system

F) **Infrastructure:** Provide infrastructure improvements compatible with the natural and human environment

G) ***Cost:*** Develop a financially responsible infrastructure implementation plan

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Project Location

CH 21 Downtown Prior Lake Reconstruction – Local Transportation Assessment

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Figure 1

Existing CH 21 Conditions

The *Existing Traffic Conditions Memorandum,* dated September 25, 2017, included vehicular/pedestrian intersection turning movement counts, vehicular travel speeds on CH 21, a safety analysis, and intersection/corridor traffic operations. Intersections along CH 21 at MN Highway 13, Main Avenue, Arcadia Avenue, and Duluth Avenue, as well as the MN Highway 13/Pleasant Street intersection were included in this assessment, which is summarized as follows:

1) Crash and severity rates at the study intersections/corridor generally fall below average rates for locations with similar characteristics, except the CH 21/Duluth Avenue intersection, which has a high percent of right-angle crashes (i.e. northbound left- and eastbound thru crashes).
2) The CH 21/MN Highway 13 intersection operates at an overall LOS F during the p.m. peak hour as a result of the current traffic signal operation/roadway configuration (i.e. split phasing).
3) Eastbound queues from the CH 21/MN Highway 13 intersection frequently extend beyond the CH 21/Main Avenue intersection during peak periods; occasionally, westbound queues from the CH 21/Main Avenue intersection extend to the CH 21/MN Highway 13 intersection.
4) Due to congestion along CH 21 between MN Highway 13 and Main Avenue, motorists were observed using alternative routes (i.e. through downtown) to avoid congestion.

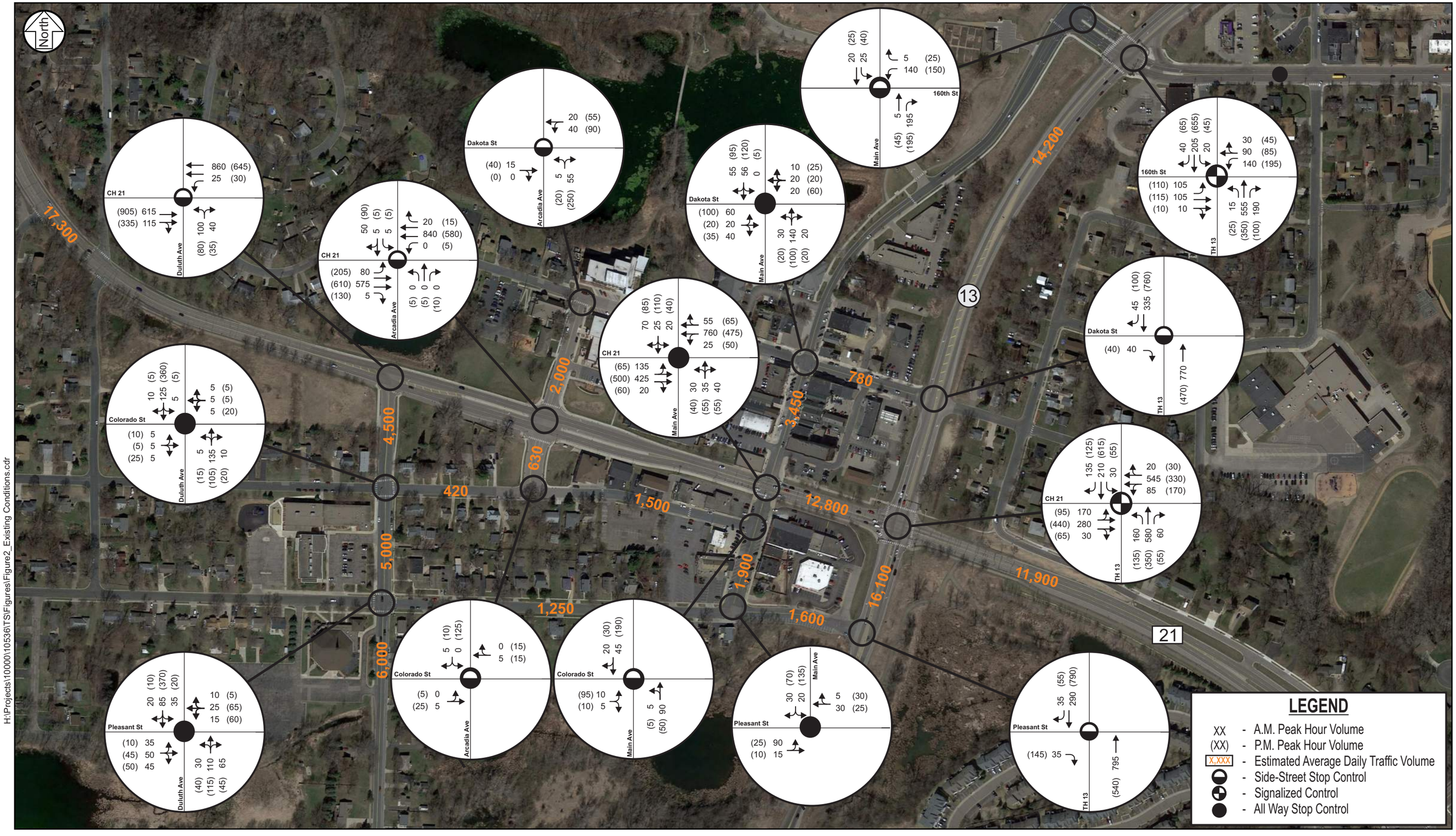
Existing Local Transportation System Conditions

Data Collection/Observations

Supplemental short-duration (i.e. 15-minute) traffic volumes were collected on the local roadway network during the a.m. and p.m. peak periods at the following intersections. This data was used to supplement historical and existing data along the local transportation system to set the baseline condition to which each alternative can be compared.

1) Duluth Avenue/Colorado Street
2) Duluth Avenue/Pleasant Street
3) Arcadia Avenue/Dakota Street
4) Arcadia Avenue/Colorado Street
5) Main Avenue/160th Street
6) Main Avenue/Dakota Street
7) Main Avenue/Colorado Street
8) Main Avenue/Pleasant Street

The local transportation system is made up of primarily two-lane roadways with 30 miles per hour (mph) posted speed limits. The Duluth Avenue/Colorado Street, Duluth Avenue/Pleasant Street, Main Avenue/Dakota Street, and Main Avenue/Pleasant Street intersections have all-way stop control. The remaining local intersections are side-street stop controlled. Existing conditions are summarized in Figure 2.



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Existing Conditions

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Figure 2

Travel Patterns

A review of collected traffic volume patterns and field observations indicate that **motorists are using downtown local roadways to access downtown businesses, but also as alternative routes to avoid congestion at the CH 21/MN Highway 13 intersection.** The following observed alternative routes (through the downtown local roadway network) were identified and are illustrated in Figure 3.

1) To/from MN Highway 13 to the south and CH 21 to the west
   a) Motorists traveling northbound on MN Highway 13 and destined for westbound CH 21 are using Duluth Avenue as an alternative route.
   b) Motorist traveling eastbound on CH 21 and destined for southbound MN Highway 13 are using Duluth Avenue as an alternative route.
2) To/from MN Highway 13 to the north and CH 21 to the west
   a) Motorist traveling eastbound on CH 21 and destined for northbound MN Highway 13 are using both Arcadia Avenue and Main Avenue as an alternative route.
   b) Motorists traveling southbound on MN Highway 13 and destined for westbound CH 21 are using Main Avenue and/or Dakota Street/Arcadia Avenue as an alternative route.
3) From MN Highway 13 to the south and destined for MN Highway 13 to the north
   a) Motorists traveling southbound on MN Highway 13 and destined for southbound MN Highway 13 are using Main Avenue to Pleasant Street as an alternative route.

Historical Traffic Volumes

Historical traffic volumes along local roadways were reviewed to understand how area traffic volumes have changed over the years. **In general, traffic volumes along the local transportation system within Downtown Prior Lake have been steady or decreased over the past 10-plus years.** A summary of the local roadway historical average daily traffic volumes is provided in Figure 4.

Crash History

Crash data on the local roadways within Downtown Prior Lake was obtained from the Minnesota Crash Mapping Analysis Tool (MnCMAT) for the period from January 1, 2011 to December 31, 2015, which represents the most recent five-year period available. During that period, crashes were reported at the following locations:

1) Near the Duluth Avenue/Pleasant Street intersection (2)
2) Near the Arcadia Avenue/Dakota Street intersection (1)
3) Along Dakota Street between Arcadia Avenue and MN Highway 13 (2)
4) At the Main Street/Kop Parkway intersection (2)

The amount of reported crashes does not suggest any safety issues on local roadways within the study area from a frequency perspective.

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Observed Alternative Routes Through Downtown During Peak Periods

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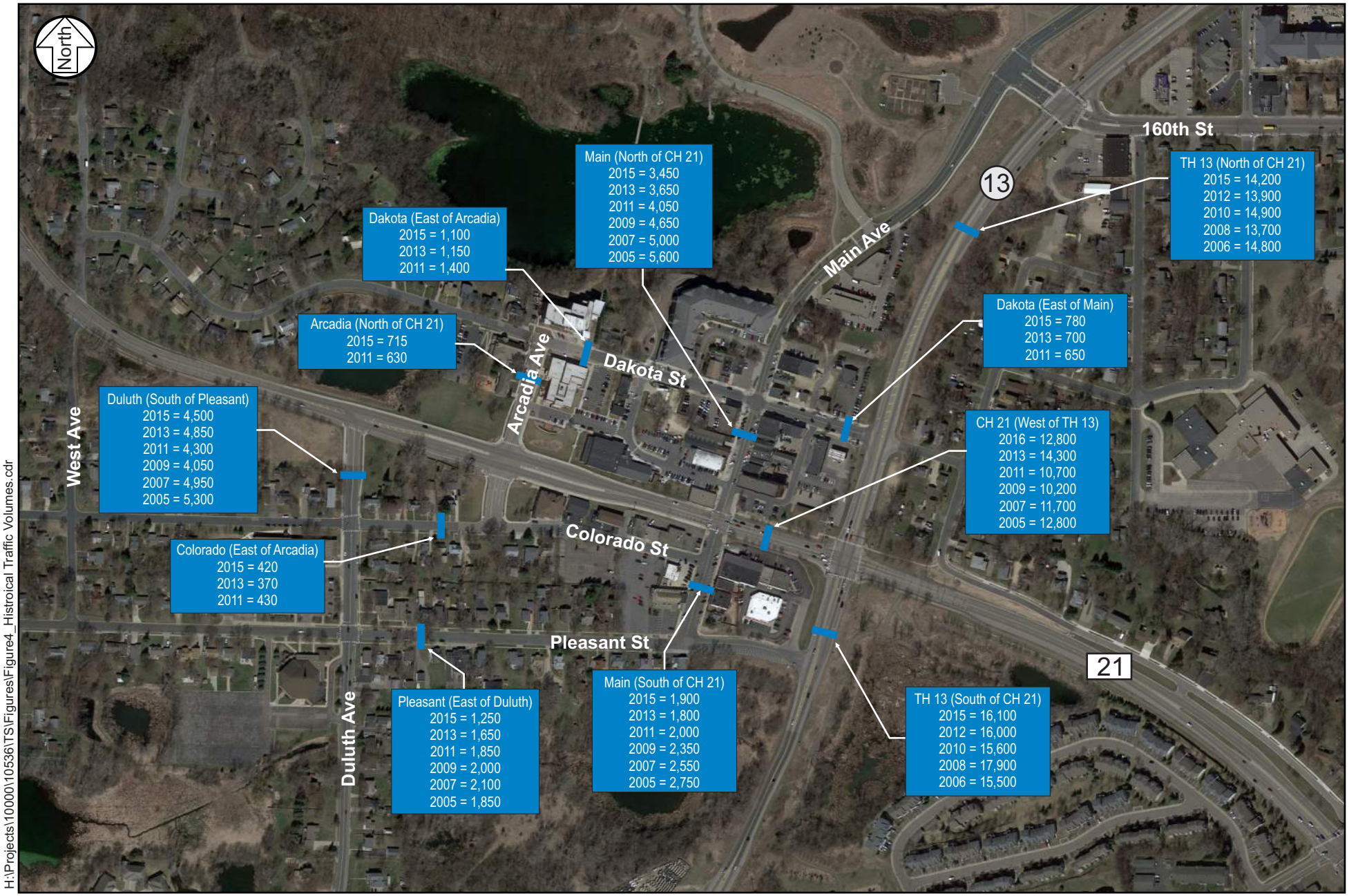
Figure 3



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MnDOT Historical Traffic Volumes

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Figure 4

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Pedestrian Network

Within the study area, the existing pedestrian network includes sidwalks, boardwalks, City trails, and the Scott West Regional Trail (see mapped network on the right). **In general, the downtown area sidewalk network is well built out with few gaps.** Along CH 21 at MN Highway 13 and Main Avenue there are marked crosswalks across CH 21. There are no marked crosswalks across CH 21 at Acardia Avenue or Duluth Avenue. In May 2017, 13-hour counts were conducted that identified the number of pedestrians crossing CH 21 at Duluth Avenue (two), Arcadia Avenue (11) and Main Avenue (45). While this study focuses on CH 21 between MN Highway 13 and Duluth Avenue, it should be noted that crossing and walking/biking along CH 21 west of Duluth Avenue, where the roadway curves, can be uncomfortable due to the close proximity (i.e. a lack of buffer) between the roadway and the sidewalk/trail.

Parking Utilization

Parking utilization data was collected as part of the *Prior Lake Downtown Parking Study - Existing and Future Conditions* study (memorandum dated October 2014). The utilization data was reviewed to understand impacts to area parking. On-street and off-street parking utilization counts were collected in the downtown area on a weekday during the morning (9:00 a.m.), afternoon (2:00 p.m.), and evening (6:00 p.m.). **North of CH 21, parking utilization rates (percent of parking spaces occupied) range from 34 to 45 percent, where the highest parking demand occurred in the afternoon. South of CH 21, parking utilization rates range from 26 to 39 percent of parking spaces occupied, where the highest parking demand occurred in the evening.**

Alternatives Overview

As discussed in the *Future Traffic Conditions Memorandum* (dated October 4, 2017), four alternatives were selected for further evaluation. An overview of each remaining CH 21 alternative, as well as some key differentiators are provided as follows.

Alternative A-1 (Arcadia with Signal)

This alternative was submitted and awarded federal funding. Alternative A-1 expands the CH 21/ MN Highway 13 intersection to accommodate eastbound/westbound left- and right-turn lanes, as well as dual northbound and southbound left-turn lanes. The addition of the turn lanes allow the signal phasing at the CH 21/MN Highway 13 intersection to change from the current split-phased operation to protected/permitted phasing, which provides increased capacity and signal timing flexibility. Other key differentiators include:

1) Full Access at MN Highway 13 (Signal) and Arcadia Avenue (Signal)
2) Three-Quarter Access along MN Highway 13 at Pleasant Street
    a. Consideration was given to shifting the intersection to the south, however due to cost the three-quarter is shown at the same location as it currently exists. The northbound left-turn storage has been modified to accommodate both the dual northbound left-turns at the CH 21/MN Highway 13 intersection, as well as a northbound left-turn lane at Pleasant Street.
3) Right-In/Right-Out (RIRO) Access along CH 21 at Main Avenue and Duluth Avenue
4) CH 21 Pedestrian Crossings at MN Highway 13, Main Avenue, and Arcadia Avenue.
    a. The MN Highway 13 and Arcadia Avenue crossings are controlled (signal) and the Main Avenue crossing is designed as a two-stage crossing with the opportunity to install a rectangular rapid flashing beacon (RRFB) or a hybrid pedestrian crosswalk (HAWK).
5) The estimated cost is $7.1M.

Alternative A-2 (Arcadia with Roundabout)

Alternative A-2 includes a multi-lane roundabout at the CH 21/MN Highway 13 intersection. Other key differentiators include:

1) Full Access at MN Highway 13 (Roundabout) and Arcadia Avenue (Roundabout)
2) Three-Quarter Access along CH 21 at Main Avenue and Duluth Avenue
3) Three-Quarter Access along MN Highway 13 at Pleasant Street
    a. This intersection remains in the same location as it currently exists due to the CH 21/ MN Highway 13 multi-lane roundabout and allows the northbound left-turn movement which is not currently allowed.
4) CH 21 Pedestrian Crossings at MN Highway 13, Main Avenue, Arcadia Avenue, and Duluth Avenue.
    a. All crossings are designed as two-stage crossings with the opportunity to install a rectangular rapid flashing beacon (RRFB) or a hybrid pedestrian crosswalk (HAWK).
5) The estimated cost is $7.3M.

Alternative B-1 (Main with Signal)

Alternative B-1 expands the CH 21/MN Highway 13 intersection to accommodate eastbound/ westbound left- and right-turn lanes, as well as dual northbound and southbound left-turn lanes. The addition of the turn lanes allows the signal phasing at the CH 21/MN Highway 13 intersection to change from the current split-phased operation to protected/permitted phasing, which provides increased capacity and signal timing flexibility. Other key differentiators include:

1) Full Access at MN Highway 13 (Signal), Main Avenue (Signal), and Duluth Avenue (Roundabout)
2) Three-Quarter Access along CH 21 at Arcadia Avenue
3) Right-In/Right-Out (RIRO) Access along MN Highway 13 at Pleasant Street
    a. This is the current intersection location and access configuration. A sub-alternative would be to modify/shorten the northbound left-turn lane storage at CH 21/MN Highway 13 to allow the northbound left-turn movement to Pleasant Street (as shown in Alternative A-1).
4) CH 21 Pedestrian Crossings at MN Highway 13, Main Avenue, and Duluth Avenue.
    a. The MN Highway 13 and Main Avenue crossings are controlled (signal) and the Duluth Avenue crossing is designed as a two-stage crossing with the opportunity to install a rectangular rapid flashing beacon (RRFB) or a hybrid pedestrian crosswalk (HAWK).
5) The estimated cost is $7.2M.

Alternative B-2 (Main with Roundabout)

Alternative B-2 includes a multi-lane roundabout at the CH 21/MN Highway 13 intersection. Other key differentiators include:

1) Full Access at MN Highway 13, Main Avenue, and Duluth Avenue (All Roundabouts)
2) Three-Quarter Access along CH 21 at Arcadia Avenue
3) Right-In/Right-Out (RIRO) Access along MN Highway 13 at Pleasant Street
    a. This is the current intersection location and access configuration. A sub-alternative would be to allow the northbound left-turn movement to Pleasant Street (as shown in Alternative A-2).
4) CH 21 Pedestrian Crossings at MN Highway 13, Main Avenue, and Duluth Avenue.
    a. All crossings are designed as two-stage crossings with the opportunity to install a rectangular rapid flashing beacon (RRFB) or a hybrid pedestrian crosswalk (HAWK).
5) The estimated cost is $7.35M.

Alternative Evaluation (Local Transportation Perspective)

The remaining four CH 21 alternatives were evaluated from a local transportation perspective to assess impacts to area travel patterns, roadway capacity, safety, access, and downtown compatibility from a land use and streetscaping perspective. This evaluation utilizes data provided in the *Future Traffic Conditions Memorandum,* dated October 4, 2017, as well as supplemental information reviewed and analyzed by SRF as part of the local transportation system evaluation. The following information provides an overall summary of the alternative impacts for several key characteristics, as well as **the key local transportation system take away (underlined and bolded)**.

Physical - Travel Pattern Changes

Physical changes to travel patterns are directly related to proposed access (i.e. full-access versus partial access) and traffic control types. The "A" alternatives assume primary intersections at MN Highway 13, Main Avenue, and Duluth Avenue, whereas the "B" alternatives assume primary intersections at MN Highway 13 and Arcadia Avenue. Alternatives A-1/B-1 and A-2/B-2 differ based on if a signalized or roundabout traffic control is assumed. A summary of the proposed access and traffic controls are provided in Table 1 and illustrated in Figure 5.

Table 1. Alternative Access/Traffic Control

Intersection	No Build (Existing)	A-1 Arcadia Signal	A-2 Arcadia Roundabout	B-1 Main Signal	B-2 Main Roundabout
CH 21/MN 13	Full - Signal	Full - Signal	Full - RAB	Full - Signal	Full - RAB
CH 21/Main	Full - AWSC	RIRO	3/4 Access	Full - Signal	Full - RAB
CH 21/Arcadia	Full - SSS	Full - Signal	Full - RAB	3/4 Access	3/4 Access
CH 21/Duluth	Full - SSS	RIRO	3/4 Access	Full - RAB	Full - RAB
MN 13/Pleasant	RIRO	3/4 Access	3/4 Access	RIRO	RIRO

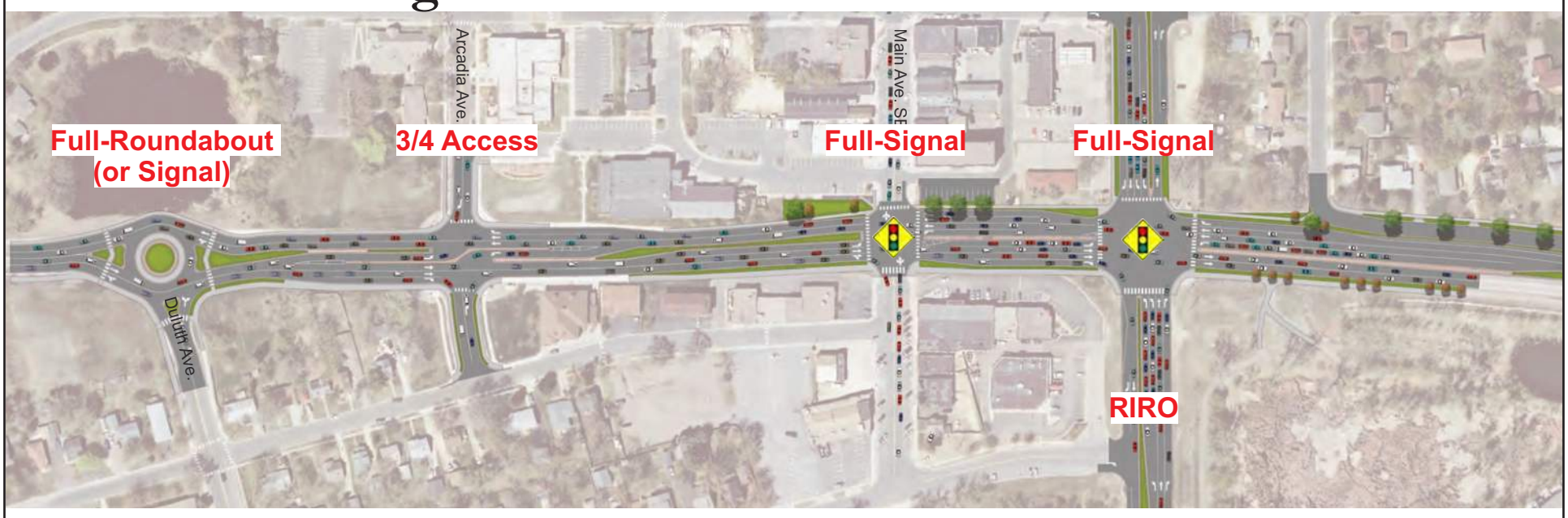
Note: RAB - Roundabout; AWSC - All-way Stop Control; SSS - Side-Street Stop Control

The access modifications associated with these alternatives impact where and how motorists access downtown. As such, each alternative was reviewed to determine/quantify the options that motorists arriving from each direction can access either north or south downtown, including traveling between north and south downtown (i.e. across CH 21). Pedestrian access across CH 21 was also reviewed. Based on this review, which is summarized in Table 2 and illustrated in Figure 6, **motorists and pedestrians traveling to downtown from any direction will have a minimum of two options to access downtown. Although each alternative provides less access than currently exists, maintaining two options to access downtown from each direction is considered reasonable from a transportation system perspective.**

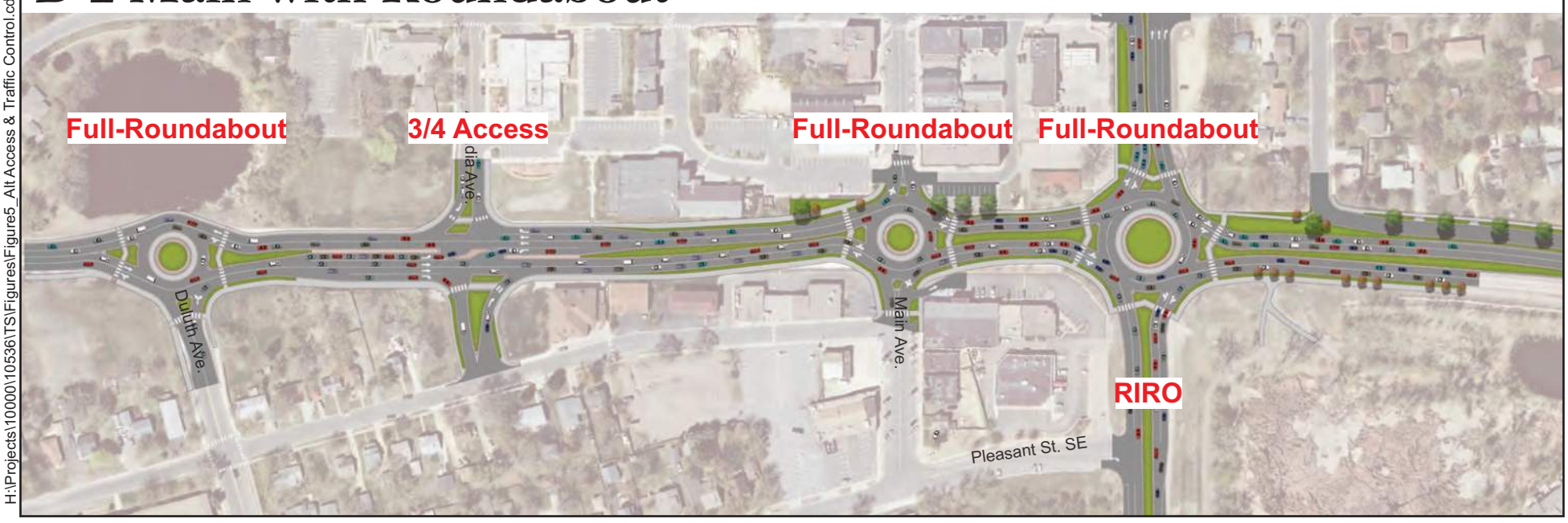
A-1 Arcadia with Signal

A-2 Arcadia with Roundabout

B-1 Main with Signal



B-2 Main with Roundabout



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CH 21 Project Alternatives

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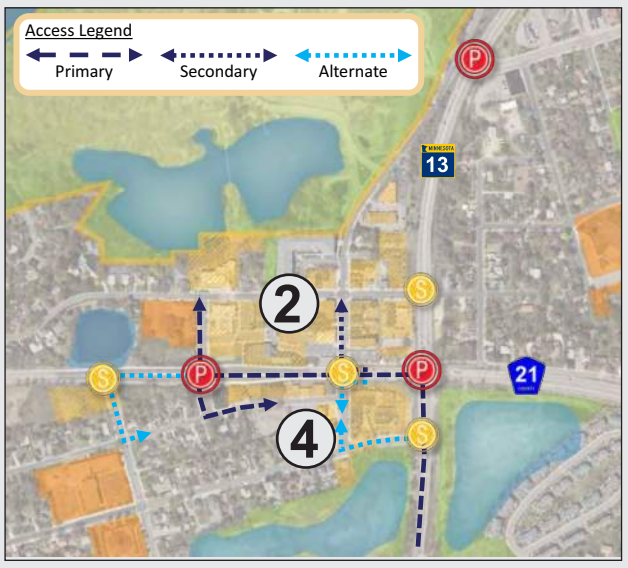
Figure 5

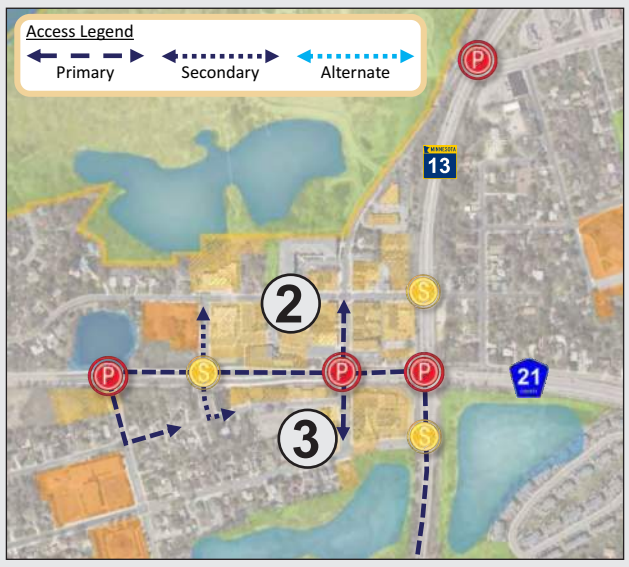
Alternative A-1/A-2

Alternative B-1/B-2

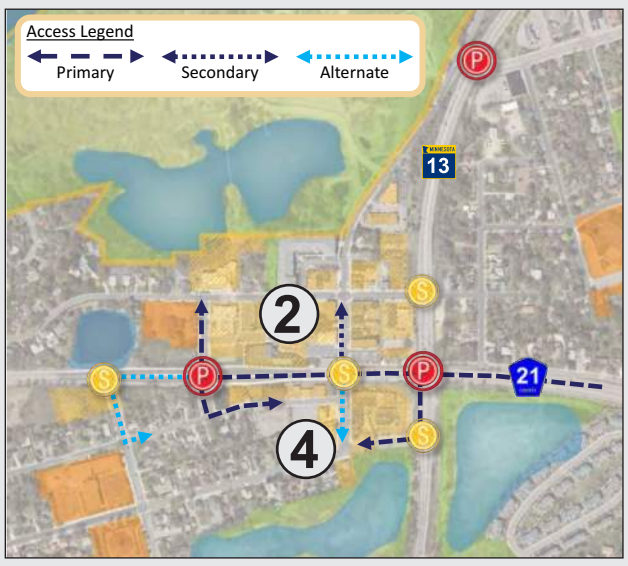
From the North

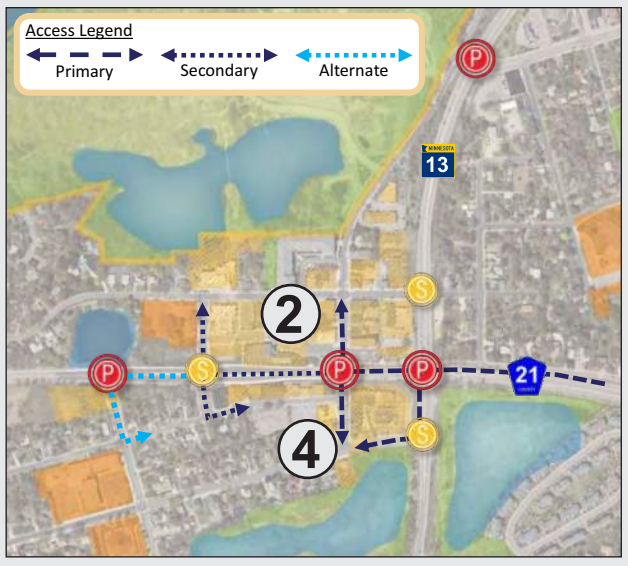
From the South



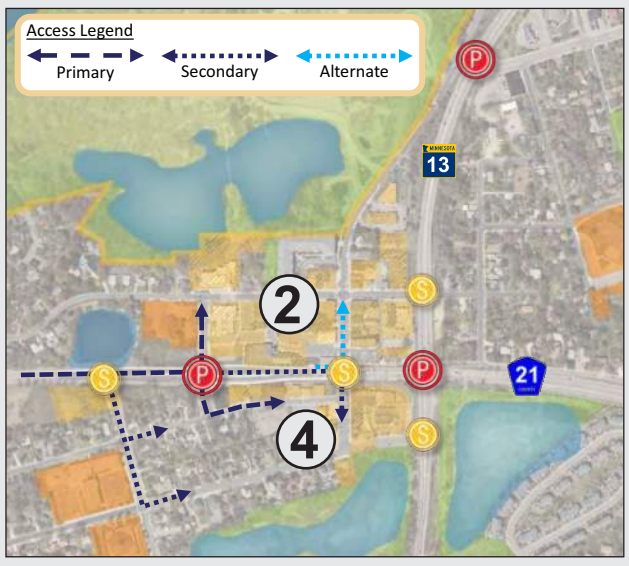


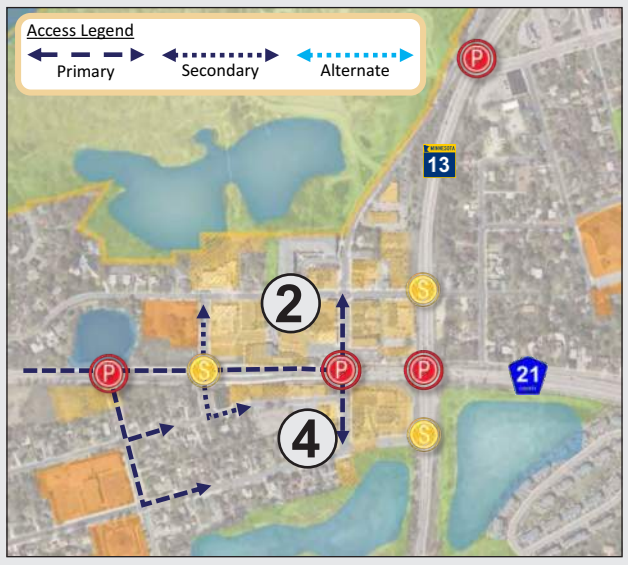
From the East



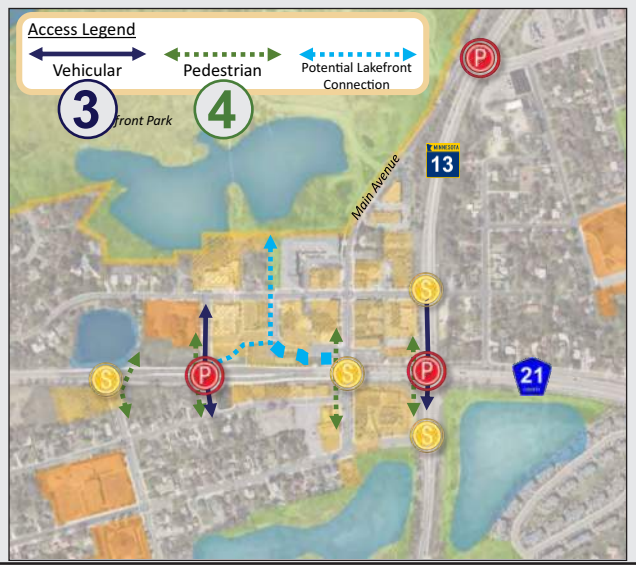


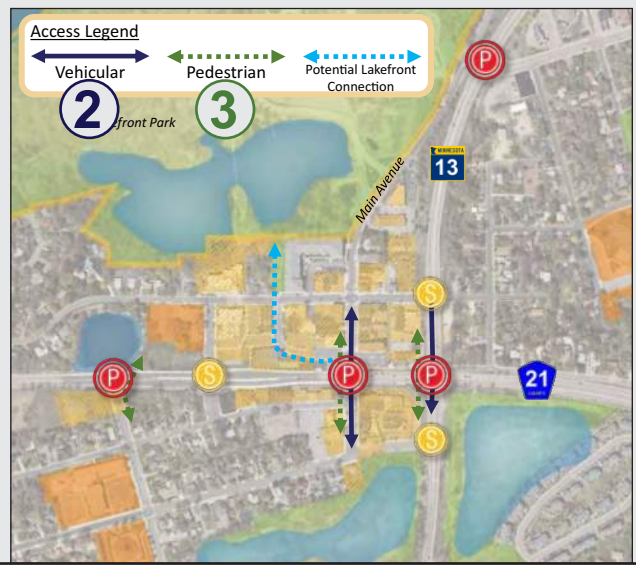
From the West





Across CH 21





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Route Options to Access Downtown

CH 21 Downtown Prior Lake Reconstruction – Local Transportation Assessment
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Figure 6

Table 2. Route Options to Access Downtown

Arriving From	Number of Route Options by Direction of Travel					
	Existing		Alternative A-1/A-2 (Primary at Arcadia)		Alternative B-1/B-2 (Primary at Main/Duluth)	
	Downtown North of CH 21	Downtown South of CH 21	Downtown North of CH 21	Downtown South of CH 21	Downtown North of CH 21	Downtown South of CH 21
North	4	3	4	3	4	3
South	2	4	2	4	2	3
East	2	4	2	4	2	3
West	2	4	2	4	2	4
Across CH 21	3 (Veh.) and 4 (Ped.)		2 (Veh.) and 3-4 (Ped.)		2 (Veh.) and 3 (Ped.)	

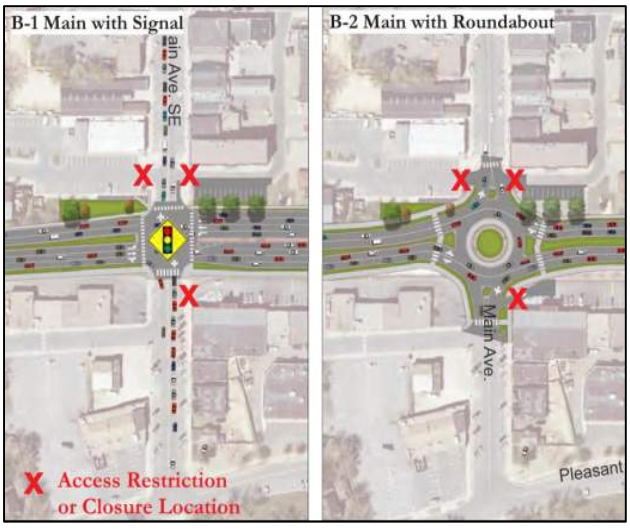
Physical - Driveway Impacts

With access modifications along CH 21, several of the alternatives impact access to adjacent driveways, particularly the alternatives where full-access (either a signal or roundabout) at Main Avenue is provided. The following information describes and illustrates how each alternative may be impacted:

1) Existing and Alternatives A-1 and A-2: No physical driveway impacts are expected

2) Alternative B-1: Driveway impacts along Main Avenue are primarily related to intersection operations, where northbound and southbound vehicular queues from the CH 21/Main Avenue intersection will regularly block driveways on Main Avenue, as well as access to Colorado Street and Erie Avenue. From a transportation system perspective, **Alternative B-1 would negatively impact access, mobility, and circulation within the downtown. When queuing of this magnitude occurs, business driveway closures and/or access restrictions (RIRO) would typically be recommended to address these concerns.**

3) Alternative B-2: Driveway impacts along Main Avenue are primarily related to the proximity and physical property needs of the CH 21/Main Avenue roundabout. The proximity of existing access (i.e. the hardware store, Colorado Street, and Erie Street) is located within the decision distance of CH 21 and has the potential to create safety issues along both Main Avenue, as well as CH 21. From a transportation system perspective, **Alternative B-2 would negatively impact access, mobility, and circulation within the downtown. When access is located within this type of proximity, business driveway closures and/or access restrictions (RIRO) would typically be recommended to address these concerns.**



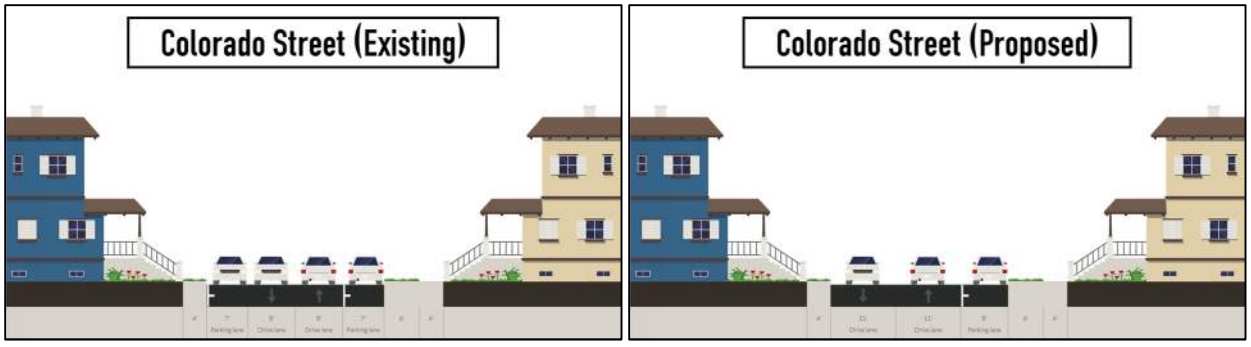
Physical – Roadway Cross-Sections and Parking Impacts

The alternatives were reviewed with respect to potential parking impacts due to traffic volume increases, expected traffic queues, and/or physical right-of-way needs for the CH 21 improvements. A portion of the on-street angled parking along Main Avenue may need to be removed under Alternatives B-1 and B-2. A parking impact summary for Alternatives B-1 and B-2 are as follows:

1) Alternative B-1: Parking impacts along Main Avenue are primarily due to intersection queues at the CH 21/Main Avenue intersection, which are expected to regularly block access to parking spaces within one-block north and south of CH 21. These queues create conflicts and potential safety concerns. Additional review/consideration is needed to determine how many on-street parking spaces would need to be removed to safely accommodate vehicular operations.

2) Alternative B-2: Parking impacts along Main Avenue south of CH 21 are related to the proximity and physical property needs of the CH 21/Main Avenue roundabout. To accommodate the roundabout, at a minimum, parking spaces between CH 21 and Colorado Street would likely need to be removed.

Parking is currently permitted on both sides of Colorado Street and Pleasant Street between Duluth Avenue and Main Avenue. However, the widths of these roadways are approximately 30 feet and 34 feet, respectively. To allow for adequate space for two travel lanes in each direction, the City may want to **consider restricting parking to one-side of the roadway along Colorado Street and Pleasant Street**. While this is an existing need, the need to restrict parking is more prevalent under Alternatives A-1 and A-2 and along Colorado Street. Traffic volumes along Colorado Street, between Duluth Avenue and Main Avenue, are anticipated to increase as a result of motorists rerouting from restricted movements at Duluth Avenue and Main Avenue. An illustration of the existing and proposed Colorado Street cross-sections are shown below. These **cross-section/parking modifications along Colorado Street and Pleasant Street are not expected to significantly impact parking within downtown given the utilization data collected as part of the downtown parking study in 2014.**



Operational – CH 21 Corridor Travel Times

All four alternatives are expected to improve corridor travel times during peak conditions in both directions along CH 21 compared to the existing roadway configuration. A summary of the estimated eastbound and westbound corridor travel times under year 2040 conditions for each alternative are summarized in Table 3. The results indicate that **the two roundabout alternatives (A-2 and B-2) provide the shortest corridor travel times**.

Table 3. Estimated Year 2040 CH 21 Travel Times

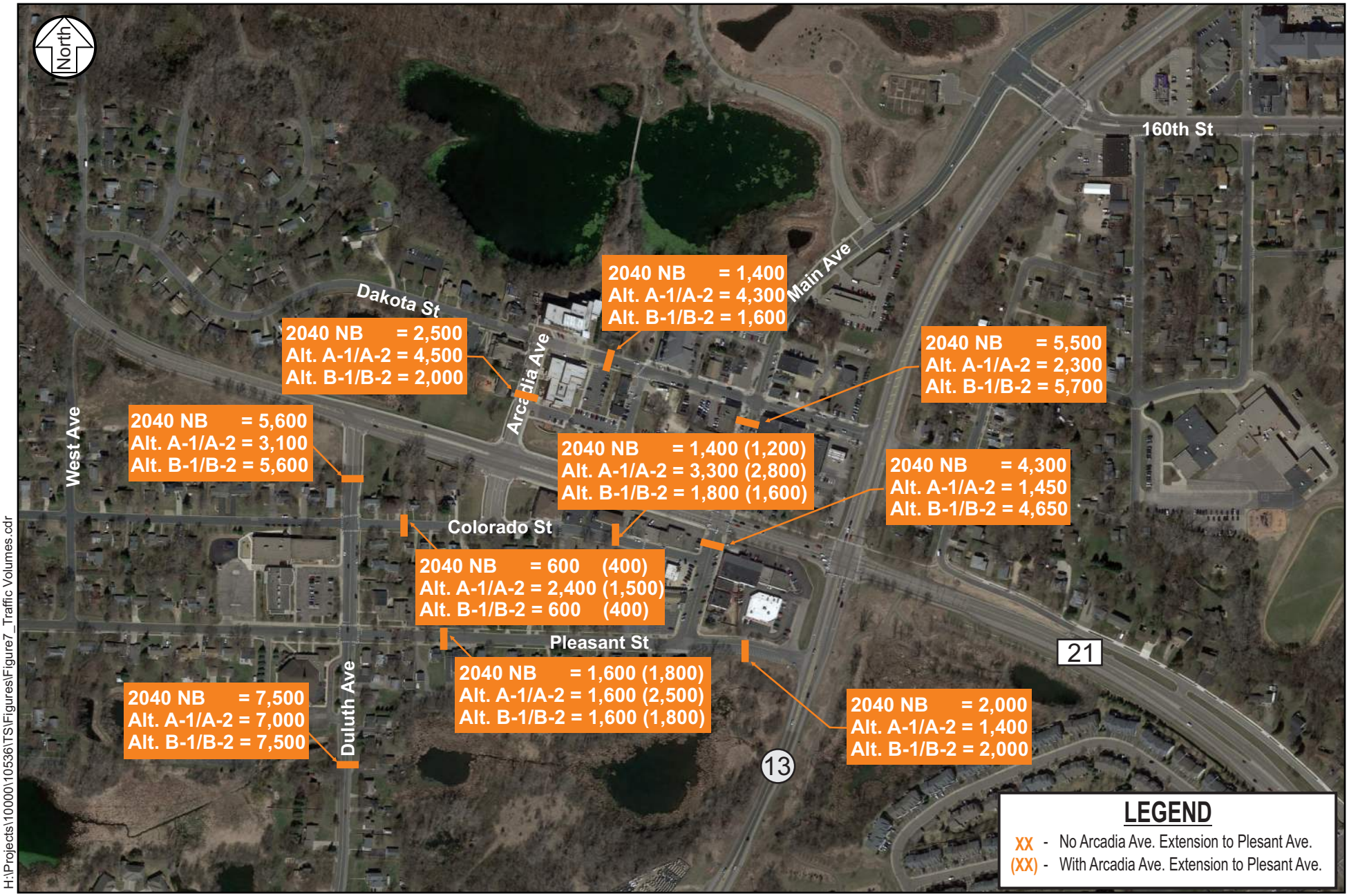
Year 2040	Peak Hour	Alternative Travel Time (Percent Improvement from Existing)				
		Existing	A-1	A-2	B-1	B-2
EB Travel Time (s) Duluth Ave to MN 13	AM	175 (0%)	70 (60%)	45 (75%)	75 (55%)	45 (75%)
	PM	420 (0%)	150 (65%)	80 (80%)	225 (50%)	70 (85%)
WB Travel Time (s) Duluth Ave to MN 13	AM	375 (0%)	180 (50%)	110 (70%)	165 (55%)	110 (70%)
	PM	430 (0%)	110 (75%)	55 (85%)	100 (75%)	45 (90%)

It should be noted that **the roundabout alternatives have less intersection delay and generally slower corridor speeds in between intersections whereas the signal alternatives have higher intersection delay and higher speed in between intersections.**

Operational - Local Roadway Traffic Volumes

Changes in the local roadway traffic volumes were estimated based on the proposed access restrictions for each alternative. **From a capacity perspective, the local roadway system can accommodate the change in year 2040 traffic volumes that are expected based on each alternative.** The expected traffic volume changes to the local roadway network are illustrated in Figure 7. Note that if no improvements were made, more motorists using downtown as an alternative route due to increased CH 21/MN Highway 13 congestion are expected.

1) Alternatives A-1 and A-2
   a) Due to northbound/southbound access restrictions along CH 21 at Main Avenue and Duluth Avenue, motorists are expected to reroute to Arcadia Avenue or MN Highway 13.
   b) Improved operations along CH 21 at the Main Avenue and MN Highway 13 intersections are expected to reduce the number of motorists using the downtown local roadway network as an alternative route during the peak periods.
2) Alternatives B-1 and B-2
   a) Due to northbound/southbound access restrictions along CH 21 at Arcadia Avenue, motorists are expected to reroute to Main Avenue or Duluth Avenue.
   b) Improved operations along CH 21 at the Main Avenue and MN Highway 13 intersections are expected to reduce the number of motorists using the downtown local roadway network as an alternative route during the peak periods.



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CH 21 Downtown Prior Lake Improvment Project Alternatives - Traffic Volumes

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Figure 7

Since the access restrictions are generally the same, the volume impacts to the local roadway network are expected to be similar for Alternatives A-1/A-2 versus Alternatives B-1/B-2. However, it should be noted that **the roundabout alternatives are expected to better facilitate U-turns along CH 21 as compared to the signal alternatives**. While it is difficult to quantity how many motorists will chose to make a U-turn rather than use the local system to divert to their desired location, **facilitating the U-turn movement at the roundabouts provide additional route options for motorists.**

Quantifying the current level of motorists diverting through downtown or via other local roadways during the peak periods is difficult. However, we understand that **each of the alternatives will improve CH 21 corridor operations and would result in less motorists diverting through the downtown than currently occurs.** Gaining a better understanding how each alternative will impact local roadway peak hour and daily traffic volumes could provide the City with an improved decision. To achieve this, **for all alternatives, there is the option to construct the project in phases**. This would entail reconstructing the CH 21/MN Highway 13, CH 21/Main Avenue, and TH 13/Pleasant Street intersections as part of Phase 1, while the remaining CH 21 corridor (i.e. Duluth Avenue to Arcadia Avenue) could be reconstructed as part of Phase 2. **By phasing the improvements/ construction, this would allow time to observe/analyze how Phase 1 improvements impact area traffic volumes/travel patterns and allow stakeholders time to make a more informed decision regarding the remaining infrastructure needs.**

Operational - Year 2040 Delay and Queues

While it is good practice to evaluate future traffic operations under a long-term scenario (i.e. year 2040 traffic forecasts), the transportation industry is undergoing rapid change. How/when implementation of connective and autonomous vehicles will significantly impact traffic operations and safety. The **evolving vehicle technology should also be taken into consideration when reviewing the following key findings of the intersection capacity analysis (i.e. level of service and queues) for each alternative**.

1) Alternative A-1
    a) The CH 21/MN Highway 13 intersection operates at an overall LOS E during the a.m. and p.m. peak hours. All other study intersections operate acceptably (LOS C or better).
    b) Westbound queues from the CH 21/MN Highway 13 intersection extend 1,350 feet during the a.m. peak; southbound queues extend 1,425 feet during the p.m. peak.
2) Alternative A-2
    a) The CH 21/MN Highway 13 intersection operates at an overall LOS E during the a.m. peak hour. All other study intersections operate acceptably (LOS C or better).
    b) Westbound queues from the CH 21/MN Highway 13 intersection extend 2,000 feet during the a.m. peak; southbound queues extend 1,400 feet during the p.m. peak.
    c) Westbound left-turn queues at the CH 21/Duluth Avenue intersection extend 650 feet during the p.m. peak, which extends through the Arcadia Avenue intersection.

3) Alternative B-1
   a) The CH 21/MN Highway 13 intersection operates at an overall LOS E during the a.m. and p.m. peak hours. All other study intersections operate acceptably (LOS D or better).
   b) Westbound queues from the CH 21/MN Highway 13 intersection extend 1,150 feet during the a.m. peak; southbound queues extend 975 feet during the p.m. peak.
   c) Southbound queues at CH 21/Main Avenue extend 350 to 400 feet during the a.m. and p.m. peak hours; Southbound queues extend 200 to 350 feet during the p.m. peak. These queues will significantly inhibit downtown access, mobility, circulation, and parking.
4) Alternative B-2
   a) The CH 21/MN Highway 13 intersection operates at an overall LOS E during the a.m. peak hours. All other study intersections/time periods operate acceptably (LOS D or better).
   b) Westbound queues from the CH 21/MN Highway 13 intersection extend 2,125 feet during the a.m. peak; southbound queues extend 1,325 feet during the p.m. peak.
   c) Eastbound queues at the CH 21/Main Avenue intersection extend approximately 750 feet and westbound queues extend approximately 300 feet during the p.m. peak hour. These westbound queues have the potential to impact traffic operations at the CH 21/MN Highway 13 intersection.

Based on the capacity analysis, **Alternatives A-2 and B-2 (roundabouts) provide the best operations at the CH 21/MN Highway 13 intersection and less potential for impacts to the local transportation system as compared to the signal alternatives. However, northbound/ southbound queues at the CH 21/Main Avenue intersection under Alternative B-1 will significantly inhibit downtown access, mobility, circulation, and parking.** In addition, **the proximity of the two roundabouts on CH 21 at MN Highway 13 and Main Avenue (i.e. Alternative B-2) provides more risk of queues impacting CH 21/MN Highway 13 operations than the other alternatives.**

Operational - Vehicular Safety

MnDOT estimated the crash rate (i.e. number of crashes per million entering vehicles) and severity rate (weighted crash rate based on the number of injury-related or fatal type crashes per million entering vehicles) for high volume/low speed signals and multi-lane roundabouts. For comparison purposes the average crash rates and severity rates for each traffic control are summarized below.

1) Signal Crash Rate: 0.7 crashes per MEV and Severity Rate: 0.97 injury crashes per MEV
2) Roundabout Crash Rate: 1.4 crashes per MEV and Severity Rate: 0.39 injury crashes per MEV

In addition, MnDOT publishes crash values based on the severity of the crash. These crash values are published to assist with benefit-cost studies. The assumed crash costs include, Fatal ($11,000,000), Injury A ($590,000), Injury B ($170,000), Injury C ($87,000), and Property Damage ($7,800).

The main differentiator between Alternatives A-1/B-1 and Alternatives A-2/B-2 is signalized versus multi-lane roundabout traffic controls. Using this information, Alternatives A-1 and B-1 are expected to result in a lower crash frequency, but higher severity type crashes, while Alternatives A-2 and B-2 are expected to result in a higher crash frequency, but fewer severe crashes. **If the weighted crash costs are the same between the alternatives, the less severe type crash alternatives should be favored.**

Operational - Pedestrian Safety

Research indicates the following average driver yield rates for pedestrians at various crossing types and traffic controls:

1) Marked crosswalk/pedestrian crossing warning signage: 7 percent
2) Marked crosswalk with center island pedestrian refuge area: 34 percent
3) Marked crosswalk with RRFB: 84 percent
4) Marked crosswalk with HAWK: 97 percent
5) Marked crosswalk at a multi-lane roundabout: 41 percent
6) Signalized intersections: 99 percent
7) All-Way Stopped Control intersections: 99 percent

Based on this research, the proposed pedestrian crossing treatments for each alternative were reviewed and compared, particularly with respect to crossing CH 21:

1) Alternative A-1:
   a) Pedestrian crossings are provided at three (3) locations along CH 21 at MN Highway 13 (signal), Main Avenue (unsignalized with a RRFB or HAWK), and Arcadia Avenue (signal).
   b) Signals provide the highest driver yield rates for pedestrians.
   c) Two-stage pedestrian crossings at Main Avenue with a RRFB or HAWK is expected to provide safe operations with relatively low crossing delay (approximately 15 seconds or less).
   d) No marked pedestrian crossings are indicated at the Duluth Avenue intersection, but there is room to provide a pedestrian refuge island if a crossing is desired at this location. There would also be the opportunity to enhance this crossing with a RRFB or HAWK.
2) Alternative A-2:
   a) Pedestrian crossings are provided at four (4) locations along CH 21 at MN Highway 13 (multi-lane roundabout), Main Avenue (unsignalized with a RRFB or HAWK), Arcadia Avenue (multi-lane roundabout), and Duluth Avenue (unsignalized).
   b) Pedestrians crossing at roundabouts have lower driver yield rates than at a signal. However, pedestrians can cross the roadway in two-stages, one direction of travel at a time. There are opportunities to improve driver yield rates by installing an RRFB and/or moving the crosswalk location farther away from the roundabout to allow for better visibility of pedestrians.

c) A two-stage pedestrian crossing at Main Avenue (with a RRFB or HAWK) is expected to provide safe operations with relatively low crossing delay (approximately 15 seconds or less).

3) Alternative B-1:

a) Pedestrian crossings are provided at three (3) locations along CH 21 at MN Highway 13 (signal), Main Avenue (signal), and Duluth Avenue (multi-lane roundabout).

b) Signals provide the highest driver yield rates for pedestrians.

c) No marked pedestrian crossings are indicated at the Arcadia Avenue intersection as there is not sufficient space to provide a safe pedestrian crossing or refuge island.

d) Marked pedestrian crossings are provided at the Duluth Avenue multi-lane roundabout intersection. There are opportunities to improve driver yield rates by installing an RRFB if the volume of pedestrian activity is warranted.

4) Alternative B-2:

a) Pedestrian crossings are provided at three (3) locations along CH 21 at MN Highway 13 (multi-lane roundabout), Main Avenue (multi-lane roundabout), and Arcadia Avenue (multi-lane roundabout).

b) Pedestrians crossing at roundabouts have lower driver yield rates than at a signal. However, pedestrians can cross the roadway in two-stages, one direction of travel at a time. There are opportunities to improve the driver yield rate by installing RRFBs and/or moving the crosswalk location farther away from the roundabout to allow for better visibility of pedestrians.

Average vehicles speeds through the intersections should also be considered when evaluating the alternatives from a pedestrian safety perspective. For instance, motorists traveling through the CH 21/MN Highway 13 intersection are expected to pass through at a range between 15 and 50 mph under the signal alternatives, whereas motorists are expected to travel at a range between 15 and 20 mph under the roundabout alternatives. In terms of pedestrian safety, the risk of severe injury of a pedestrian struck by a vehicle increases from 25 percent at 25 mph to 90 percent at 45 mph, indicating that **fewer severe pedestrian-related incidents would be expected under the roundabout alternatives.**

From a pedestrian access perspective, **all alternatives provide at least three (3) north/south crossings of CH 21. Alternative A-2 is the only option that provides four (4) north/south pedestrian crossings.** From a pedestrian safety perspective, **signals have higher driver yield rates to pedestrians than at roundabouts. However, there are opportunities to enhance pedestrian crossings to enhance driver yield rates.** Caution should be used to avoid enhanced crossing proliferation (i.e. avoid too many enhanced crossings) to ensure higher driver compliance.

Compatibility – Land Use/Downtown Growth

The City's vision for the downtown area is to continue to grow west, towards Duluth Avenue, particularly south of CH 21. The current and planned land use zoning is consistent with this vision, although this transformation is expected to occur over several years, if at all. Market forces are expected to drive any change in future land use in the downtown area.

For purposes of the local transportation system review associated with the CH 21/MN Highway 13 reconstruction, the primary question relates to full-access at Arcadia Avenue (Alternatives A-1 and A-2) or Duluth Avenue (Alternatives B-1 and B-2). **Full-access at either Arcadia Avenue or Duluth Avenue will help facilitate downtown growth. A full-access at Arcadia Avenue would provide direct north/south vehicular connectivity in downtown, which is particularly important under Alternatives A-1 and A-2, which restrict access at Main Avenue.** However, this would likely result in more motorists along Colorado Avenue, particularly west of Arcadia Avenue, which is currently single-family residential.

Compatibility – Planned Transportation Improvements

The *2012 Downtown South Study* recommended that Arcadia Avenue be extended to the south providing a connection between CH 21 and Pleasant Street. A future southern extension that connects to the MN Highway 13/Duluth Avenue intersection was also identified.

Based on the current options, Alternatives A-1 and A-2 support the previous planning efforts. However, given recent soil condition data, the extension of Arcadia Avenue south of Pleasant Avenue may be cost-prohibitive. From a traffic operations perspective, the extension of Arcadia Avenue to the MN Highway 13/Duluth Avenue intersection would essentially shift a portion of motorists from Duluth Avenue to Arcadia Avenue. **The benefit of the Arcadia Avenue extension to MN Highway 13/Duluth Avenue intersection is expected to be minimal.**

The extension of Arcadia Avenue to Pleasant Street continues to have merit, particularly from a downtown circulation perspective. **The Arcadia Avenue extension to Pleasant Street would help balance vehicular activity between Colorado Street and Pleasant Street, and provide motorists with additional options to access/circulate downtown.** However, the Arcadia Avenue extension is expected to cost approximately $1.0M and may not provide the benefit relative to the cost. **The need for the Arcadia Avenue extension should be driven by market forces as future downtown redevelopment occurs within this area and does not need to be directly associated with the CH 21/MN Highway 13 reconstruction project.** The Arcadia Avenue extension could still be implemented if Alternatives B-1 or B-2 were implemented, but would provide less benefit under these scenarios.

Compatibility - Streetscape Opportunities

There are opportunities to incorporate streetscaping elements with all four alternatives. A score was generated for each alternative based on the amount of green space that each alternative has available for streetscaping elements. Streetscape elements could include items such as trees, planters, benches, lighting, decorative pavement, bike racks, monuments, and/or wayfinding signage. Streetscaping elements can change the corridor context and have the potential to reduce vehicular speeds and increase awareness of pedestrian activity. **Alternatives A-2 and B-2 provide the best opportunity to incorporate streetscaping elements. Alternative A-1 provides a good streetscaping opportunity, while Alternative B-1 provides the lease amount of opportunities.**

Compatibility - Property Impacts

All alternatives impact parcels and require full acquisition of at least one parcel. The number of impacted and full-acquisition parcels are summarized in Table 4. **Alternatives B-1 and B-2 have the highest number of impacted parcels, but require only one full-acquisition. Alternatives A-1 and A-2, require two full-acquisition parcels.**

Table 4. Alternative Access/Traffic Control

Intersection	Number of Impacted Parcels	Number of Full Acquisition Parcels
No Build (Existing)	0	0
Alternative A-1	10	2
Alternative A-2	14	2
Alternative B-1	19	1
Alternative B-2	23	1

Standalone Downtown Issues

Based on feedback received throughout the public involvement process associated with the CH 21/ MN Highway 13 reconstruction project, there were a few issue areas that were identified. **A preliminary review of these areas indicates that these are existing issues and are not expected to be significantly impacted (either positively or negatively) by the CH 21/MN Highway 13 improvements.** Therefore, these areas were reviewed independently to determine potential mitigation to address the existing issues, which could be incorporated regardless of the CH 21/MN Highway 13 reconstruction.

Dance Studio/Pedestrian Crossing

Current pedestrian crossing concerns at the existing Premiere Dance Academy, located north of Colorado Street and east of Arcadia Avenue, were reviewed. Parking for the dance studio is located off-street in a surface parking lot south of Colorado Street. The following key characteristics/issues have been identified based on current conditions and feedback:

1) Unsafe pedestrian crossing conditions on Colorado Street, between the Premiere Dance Academy and the parking lot to the south (western marked crossing).
2) Dance classes are from 2:30 p.m. to 10:00 p.m.
3) The roadway is dark and has limited lighting.
4) Vehicles travel at high speeds and use Colorado Street as a cut-through to avoid the all-way stop at the CH 21/Main Avenue intersection.
5) There are two marked pedestrian crossing locations on this segment of Colorado Street, both of which have advanced pedestrian crossing warning signage.
6) The roadway width is approximately 30 feet.
7) On-street parking is permitted on both sides of the road.

Based on a review of the current crossing, a range of potential modifications that could be made to improve pedestrian crossing in this location are summarized as follows. Note that once an alternative is selected, these options may need to be further refined/evaluated.

1) Construct curb bump outs/extensions at the marked pedestrian crossing locations to improve the pedestrian crossing visibility and reduce vehicle speed by narrowing the travel lane width.
    a) This could be for both the north and south sides of Colorado Street (or just the south side) to reduce potential conflicts with the existing drop-off lane for the dance studio.
2) Improve lighting along Colorado Street and/or install pedestrian scale lighting at the marked crosswalk locations.
3) Install a rectangular rapid flashing beacon at the marked crosswalk to improve driver yield rates.
4) Install in-road lighting, which would enhance the pedestrian crossing visibility, particularly at night.
5) Provide crossing guards during peak crossing and/or peak vehicle traffic time periods.
6) Convert Colorado Street to a one-way westbound roadway to reduce cut-through traffic from eastbound vehicles on CH 21, as well as reduce the pedestrian crossing distance.

All reconstruction alternatives improve traffic operations on CH 21 at MN Highway 13 and Main Avenue, which should reduce the number of vehicles using Colorado Street as an alternative route. However, **if access is restricted at the CH 21/Main Avenue intersection (i.e. Alternatives A1 and A2) traffic volumes on Colorado Street are expected to increase compared to Alternatives B1 and B2 due to motorists rerouting to Arcadia Avenue to access south downtown. The construction of the Arcadia Avenue extension between Colorado Street and Pleasant Street would provide an alternative route for motorists and would reduce traffic volumes on Colorado Street. Regardless of the alternatives, the pedestrian crossing improvement tactics listed above would provide benefit to pedestrian crossing safety.**

School Safety/Crossing

St. Michael's Catholic School is located west of Duluth Avenue and north of Pleasant Street. Pedestrians were observed crossing Duluth Avenue at Pleasant Street during the a.m. and p.m. peak hours. The Duluth Avenue/Pleasant Street intersection is unsignalized with all-way stop control and no turn lanes. **Under all alternatives, regardless if Duluth Avenue is RIRO, three-quarter, or full access, the total volume at the Duluth Avenue/Pleasant Street intersection is expected to remain relatively similar.** If Duluth Avenue is full-access, vehicles will continue through on Duluth Avenue. However, if access is restricted at Duluth Avenue, a portion of motorists would be expected to reroute to Arcadia Avenue at Colorado Street or change their route and use MN Highway 13. **The pedestrian facilities adjacent to the St Michael's Catholic School could be reviewed separate of the CH 21/MN Highway 13 reconstruction.**

Arcadia Avenue/Dakota Street

The Arcadia Avenue/Dakota Street intersection is currently unsignalized with free-flow conditions on Dakota Street and stop control for Arcadia Avenue. The pictures below illustrate a northbound motorist's perspective waiting at the stop sign on Arcadia Avenue. As shown, when looking to the west, the view of oncoming vehicles can be challenging due to the roadway grade, tree, utilities, and parked vehicles. **To address this concern, modifying the intersection to all-way-stop control could be considered.** Addressing these sight distance concerns is expected to become more critical under Alternatives A-1 and A-2, where traffic volumes at the Arcadia Avenue/Dakota Street intersection are anticipated to increase due to the access restriction at Main Avenue.

Alternative A Hybrid

Recently, a new altenrative has been identified by the PMT that combines Alternatives A-1 and A-2 and is being referred to as "Alternative A Hybrid." While this alternative has not been fully vetted, it was reviewed from a high-level persepective. Similar to Alternative A-1, this alternative includes the following:

1) Full Access at MN Highway 13 (Signal) and Arcadia Avenue (Roundabout)
2) Three-Quarter Access along CH 21 at Duluth Avenue and MN Highway 13 at Pleasant Street
    a. The northbound left-turn storage has been modified to accommodate both the dual northbound left-turns at the CH 21/MN Highway 13 intersection, as well as a northbound left-turn lane at Pleasant Street.
3) Right-In/Right-Out (RIRO) Access along CH 21 at Main Avenue
4) CH 21 Pedestrian Crossings at MN Highway 13, Main Avenue, Arcadia Avenue and Duluth Avenue.

a. The MN Highway 13 crossing are controlled (signal) and while the other crossings are designed as a two-stage crossing with the opportunity to install a rectangular rapid flashing beacon (RRFB) or a hybrid pedestrian crosswalk (HAWK).

As previously mentioned, there is the option to option to construct the project in phases. This would entail reconstructing the CH 21/MN Highway 13, CH 21/Main Avenue, and MN Highway 13/ Pleasant Street intersections as part of Phase 1, while the remaining CH 21 corridor (i.e. Duluth Avenue to Arcadia Avenue) could be reconstructed as part of Phase 2. By phasing the improvements/ construction, this would allow time to observe/analyze how Phase 1 improvements impact area traffic volumes/travel patterns and allow stakeholders time to make a more informed decision regarding the remaining infrastructure needs.

A high-level evaluation of the hybrid option was reviewed and is summarized below based on the same criteria used to evaluate the other alternatives.

1) **Physical - Travel Pattern Changes:** Motorists and pedestrians traveling to downtown from any direction will have a minimum of two options to access downtown (consistent with the Alternatives A-1/A-2 evaluation).

2) **Physical - Driveway Impacts:** No physical driveway impacts are expected (consistent with the Alternatives A-1/A-2 evaluation).

3) **Physical - Roadway Cross-Sections/Parking Impacts:** Parking restrictions along Colorado Street and Pleasant Street (between Duluth Avenue and Main Avenue) may need to be considered to provide adequate space for two lanes of travel in each direction (consistent with the Alternatives A-1/A-2 evaluation).

4) **Operational - CH 21 Corridor Travel Times:** The corridor travel time is expected to be between Alternatives A-1 and A-2. As previously noted, roundabouts have less intersection delay and generally slower corridor speeds in between intersections, whereas signals generally have higher intersection delay and higher speed in between intersections.

5) **Operational - Local Roadway Traffic Volumes:** Traffic volume impacts to the local roadway network are expected to be similar to Alternatives A-1 and A-2. However, roundabouts better facilitate U-turns along CH 21 as compared to the signal alternatives.

6) **Operational - Year 2040 Delay and Queues:** All intersections are expected to operate acceptably under year 2040 conditions. Traffic operations at the MN Highway 13 and Main Avenue intersections are expected to operate similar to Alternative A-1 and the Arcadia Avenue and Duluth Avenue intersections are expected to operate similar to Alternative A-2.

7) **Operational - Pedestrian Safety:** Provides (4) north/south crossings of CH 21. From a pedestrian safety perspective, signals have higher driver yield rates to pedestrians than roundabouts. However, there are opportunities to enhance pedestrian crossings to improve driver yield rates.

8) **Compatibility - Land Use/Downtown Growth:** Full access is provided at Arcadia Avenue provides a direct route north/south route to access land uses on both sides of downtown (consistent with the Alternatives A-1/A-2 evaluation).

9) **Compatibility - Planned Transportation Improvements:** The hybrid option supports previous planning efforts to extend Arcadia Avenue to the south. (consistent with the Alternatives A-1/ A-2 evaluation).

10) **Compatibility - Streetscape Opportunities:** The hybrid option provides a good streetscaping opportunity (i.e. less opportunity than Alternative A-2, but more opportunity than A-1).

11) **Compatibility - Property Impacts:** The property impacts have not been fully vetted, but the number of impacted parcels would likely be between Alternatives A-1 and A-2 and the number of full acquisition parcels is expected to be two.

Summary of Findings

A summary of the local transportation assessment evaluation is summarized on the next page. This table summarizes the key findings from the physical, operational, and compatibility review. Based on a review of the driveway impacts and expected traffic operations, the PMT eliminated Alternative B-2 from further consideration. Therefore, the evaluation matrix includes a summary of key differentiators for Alternatives A-1, A-2, and B-2.

It is important to note that when considering the alternatives and the potential impacts to both the regional and local system, the transportation industry is undergoing rapid change. Therefore, while it is good practice to evaluate future traffic operations under a long-term scenario (i.e. year 2040 traffic forecasts), how/when implementation of connected and autonomous vehicles are likely to impact traffic operations and safety.

Evaluation Criteria	Key Local Transportation System Take Away	A-1 Arcadia Signal	A-2 Arcadia Roundabout	B-1 Main Signal	*B-2 Main Roundabout* *Removed from Further Consideration*	Project Goals
Physical - Travel Pattern Changes	Motorists and pedestrians traveling to downtown from any direction will have a minimum of two options to access downtown. Although each alternative provides less access than currently exists, maintaining two options to access downtown from each direction is considered reasonable from a transportation system perspective.	Good	Good	Good	*Good*	Mobility Local
Physical - Driveway Impacts	Alternative B-1 would negatively impact access, mobility, and circulation within the downtown.	Good	Good	Poor	*Poor*	Character Mobility Local
Physical – Roadway Cross-Section and Parking Impacts	Alternative B-1 would likely impact on-street angled parking along Main Avenue south of CH 21. On-street spaces near the CH 21/Main Avenue intersection may need to be removed. Due to the increase in traffic volumes along Colorado Street between Duluth Avenue and Main Avenue under Alternatives A-1 and A-2, on-street parking may need to be limited to one side of the roadway along Colorado Street and Pleasant Street.	Fair	Fair	Poor	*Poor*	Character Local
Operational - Corridor Travel Times	All alternatives are expected to improve corridor travel times. Alternative A-2 (roundabout) provides the shortest corridor travel time. The roundabout alternative (A-1) has less intersection delay and generally slower corridor speeds between intersections whereas the signal alternatives (A-1 and B-1) have higher intersection delay and higher speeds between intersections.	Fair	Good	Fair	*Good*	Character Mobility Local
Operational - Local Roadway Traffic Volumes	From a capacity perspective, the local roadway system can accommodate the change in year 2040 traffic volumes that are expected based on each alternative. Each of the alternatives will improve CH 21 corridor operations and would result in less motorists diverting through the downtown than currently occurs. For all alternatives, there is the option to construct the project in phases. By phasing the improvements/construction, this would allow time to observe/analyze how Phase 1 improvements impact area traffic volumes/travel patterns and allow stakeholders time to make a more informed decision regarding the remaining infrastructure needs.	Fair	Fair	Fair	*Fair*	Mobility Local
Operational - Year 2040 Delays and Queues	All alternatives provide overall acceptable levels of service at the study intersections. However, northbound/southbound queues at the CH 21/Main Avenue intersection under Alternative B-1 will significantly inhibit downtown access, mobility, circulation, and parking.	Good	Good	Poor	*Fair*	Mobility Local
Operational – Vehicular Safety	Multi-lane roundabouts (Alternative A-2) statistically have a higher frequency of crashes, but fewer high severity (fatal/injury related type crashes) compared to signalized intersections (Alternatives A-1/B-1). If the weighted crash costs are the same between the alternatives, the less severe type crash alternatives should be favored.	Fair	Fair	Fair	*Fair*	Safety Local
Operational – Pedestrian Safety	All alternatives provide at least three (3) north/south crossings of CH 21. Alternative A-2 is the only option that provides four (4) north/south pedestrian crossings. From a pedestrian safety perspective, signals have higher driver yield rates to pedestrians than roundabouts. However, there are opportunities to enhance pedestrian crossings to improve driver yield rates.	Good	Good	Good	*Fair*	Non-Motorized) Safety Local
Compatibility - Land Use and Downtown Growth	Improved access (i.e. full-access with a signal or roundabout) at either Arcadia Avenue or Duluth Avenue will help facilitate downtown growth. The downtown area is expected to continue to grow west, towards Duluth Avenue, particularly south of CH 21. A full-access at Arcadia Avenue would provide direct north/south vehicular connectivity in downtown, which is particularly important under Alternatives A-1 and A-2, which restrict access at Main Avenue.	Good	Good	Good	*Fair*	Feasibility Local
Compatibility – Planned Transportation Improvements	While Alternatives A-1 and A-2 support the previous planning efforts, the benefit of the Arcadia Avenue extension to the MN Highway 13/Duluth Avenue intersection is expected to be minimal. The Arcadia Avenue extension to Pleasant Street would help balance vehicular activity between Colorado Street and Pleasant Street, and provide motorists with additional options to access/circulate downtown. The need for the Arcadia Avenue extension should be driven by market forces as future downtown redevelopment occurs within this area and does not need to be directly associated with the CH 21/MN Highway 13 reconstruction project.	Good	Good	Fair	*Fair*	Feasibility Local
Compatibility - Streetscape Opportunities	Alternative A-2 provides the best opportunity to incorporate streetscaping elements. Alternative A-1 provides a good streetscaping opportunity, while Alternative B-1 provides the lease amount of opportunities.	Good	Good	Fair	*Good*	Character Local
Compatibility - Property Impacts	Alternative B-1 has the highest number of impacted parcels (19 and 23 impacted parcels, respectively), but requires only one full-acquisition. Alternatives A-1 and A-2 have few impacted parcels (10 and 14, respectively), but requires two full-acquisition parcels.	Fair	Fair	Poor	*Poor*	Feasibility Cost Local