

CH 21 Downtown Reconstruction Project County Board Workshop



Tuesday, October 24, 2017

CH 21 Downtown Prior Lake Reconstruction





Agenda

- 1) Review remaining Project Alternatives**
- 2) Public Engagement Summary**
 - a. Prior Lake Student Council Input
 - b. Speak Up Online Forum
 - c. Stakeholder Engagement Activities
 - d. Local Roadway Assessment
- 3) Multilane Roundabout Lessons Learned**
- 4) Next Steps / Decision-making process**

CH 21 Downtown Prior Lake Reconstruction





2019 Project Alternatives

TH 13/CH 21
Intersection as...



Primary
Intersection at...



Arcadia Ave.



Main Ave.



Arcadia Ave.



Main Ave.

Potential
Project
Alternatives...

A-1

B-1

A-2

B-2



A-1 Arcadia w/ Traffic Signal at TH 13

Intersection Controls

- Duluth: Right-in/-out
- Arcadia: Signal
- Main: Right-in/-out
- TH 13: Signal



A-1 *Modified* Arcadia w/ Traffic Signal at TH 13

Intersection Controls

- Duluth: Right-in/-out
- Arcadia: Signal
- Main: Right-in/-out
- TH 13: Signal



A-1 *Modified* Arcadia w/ Traffic Signal at TH 13

Intersection Controls

- Duluth: Right-in/-out
- Arcadia: Signal
- Main: Right-in/-out
- TH 13: Signal



A-1 *Modified* Arcadia w/ Traffic Signal at TH 13

Key Benefits

- Fewest property impacts
- Best pedestrian crossing performance
- Lowest crash potential

Key Challenges

- Fewer downtown access points
- Less efficient traffic operations
- ~~Highest project costs~~

You can expect:

- Stop & Go Traffic - *speeds at or near posted when green, queued up when red*
- 35-50% reduction in delay at TH 13/CH 21
 - 2-3 hours of congestion
- Pedestrian-Focused Main Avenue
- Vehicle-Oriented Perimeter of Downtown

Approximately same cost as other alternatives with variations that remove the Pleasant St. and Arcadia St. extensions



A-2 Arcadia w/ Roundabout at TH 13

Intersection Controls

- Duluth: $\frac{3}{4}$ Access
- Arcadia: Roundabout
- Main: $\frac{1}{2}$ $\frac{3}{4}$ Access
- TH 13: Roundabout



A-2 Arcadia w/ Roundabout at TH 13

Key Benefits

- Low property impacts
- Most efficient traffic operations
- Best accommodates local and regional trips

Key Challenges

- High number of crashes
- Risk in funding eligibility
- Pedestrian safety

You can expect:

- Lower and more consistent speeds on CH 21
- 85% reduction in delay at TH 13/CH 21
- More crashes at TH 13/21
 - Fewer injury crashes
- Pedestrian-Vehicle balance on Main Avenue
- Less burden on the city street system
 - **35% reduction** in delay for Main Avenue



Alternative A *HYBRID*

Intersection Controls

- Duluth: $\frac{3}{4}$ Access
- Arcadia: Roundabout
- Main: Right-in/-out
- TH 13: Signal



B-1 Main w/ Traffic Signal at TH 13

Intersection Controls

- Duluth: Roundabout
- Arcadia: $\frac{3}{4}$ Access
- Main: Signal
- TH 13: Signal



B-1 Main w/ Traffic Signal at TH 13

Key Benefits

- Most downtown access points
- Managed traffic movements
- Lowest cost

Key Challenges

- Least efficient traffic operations
- Longest Main Avenue delay
- Highest crash severity

You can expect:

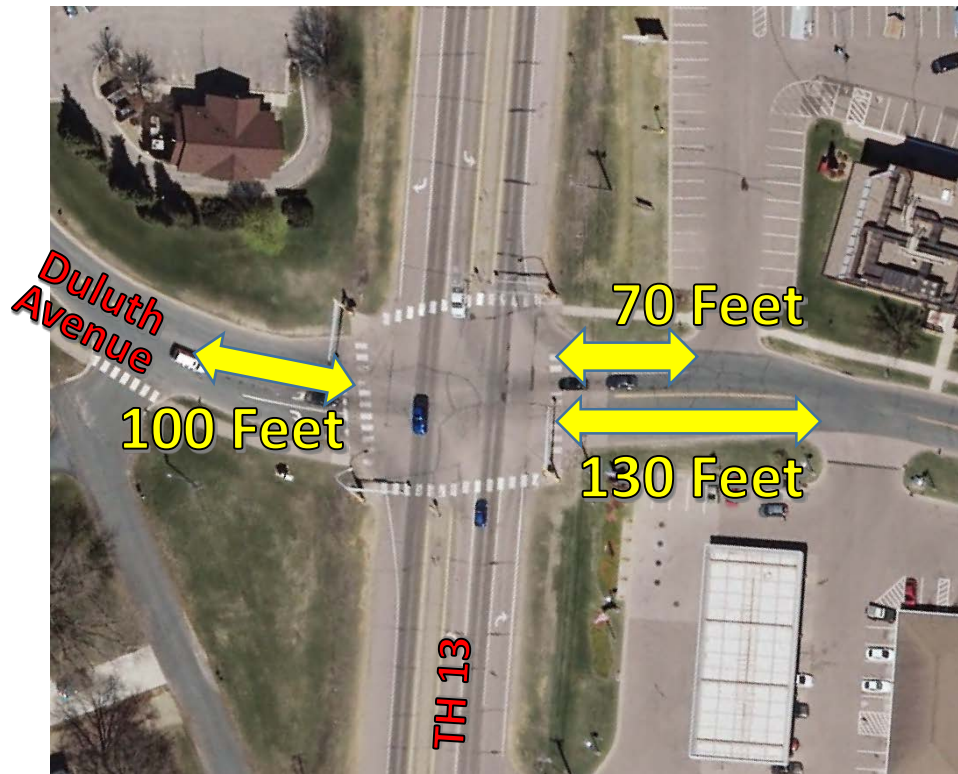
- Stop & Go Traffic - *speeds at or near posted when green, queued up when red*
- 35-50% reduction in delay at TH 13/CH 21
 - 2-3 hours of congestion
- Vehicle-Oriented Main Avenue
- Main Ave Signal subordinate To TH 13
 - **60% increase** in delay for Main Avenue
 - **Stacked vehicles** on Main Avenue
 - 4-6 times longer pedestrian crossing



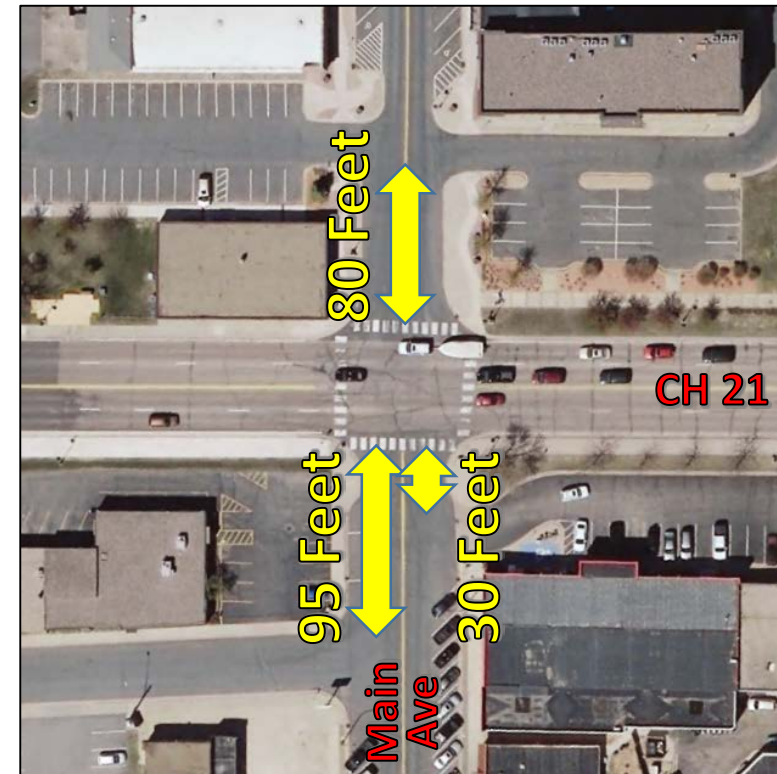
B-1 Main w/ Traffic Signal at TH 13

You can expect: **Stacked vehicles** on Main Avenue

TH 13 at Duluth Avenue



CH 21 at Main Avenue





B-2 Main w/ Roundabout at TH 13

Intersection Controls

- Duluth: Roundabout
- Arcadia: $\frac{3}{4}$ Access
- Main: Roundabout
- TH 13: Roundabout



B-2 Main w/ Roundabout at TH 13



Intersection Controls

- Duluth: Roundabout
- Arcadia: $\frac{3}{4}$ Access
- **Main: Roundabout**
- TH 13: Roundabout



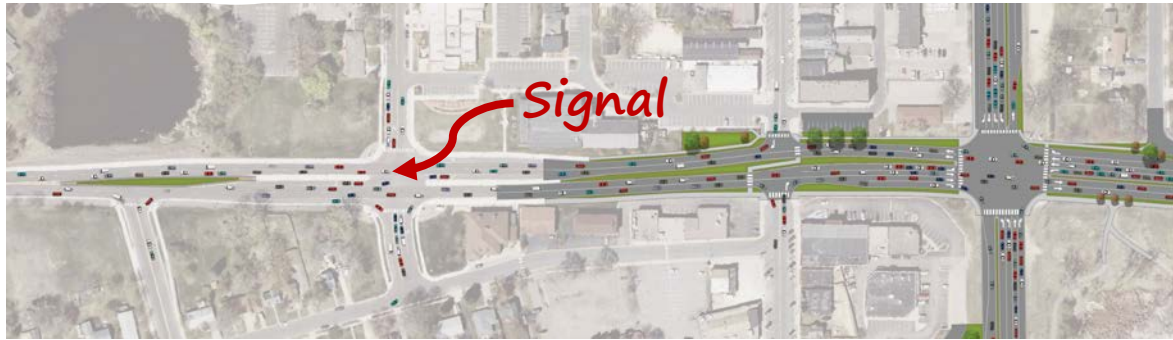
Alternative B *HYBRID*

Intersection Controls

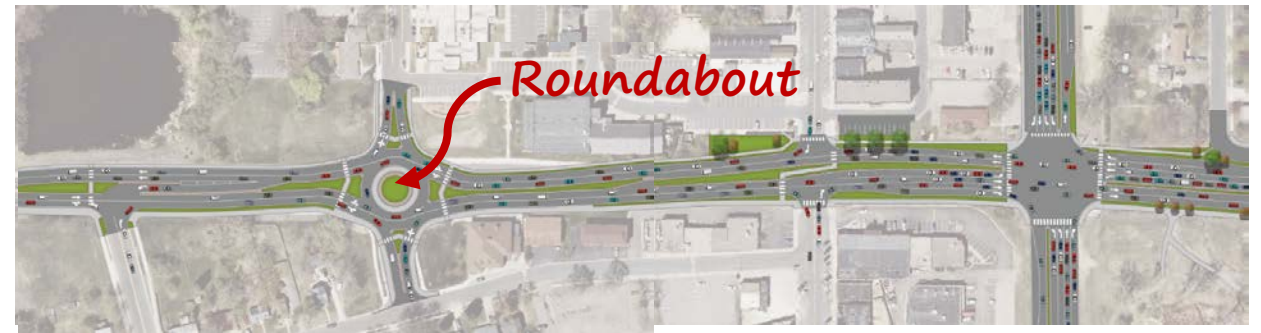
- Duluth: Roundabout
- Arcadia: $\frac{3}{4}$ Access
- **Main: Partial $\frac{3}{4}$ Access**
- TH 13: Roundabout



Project Alternatives Under Consideration



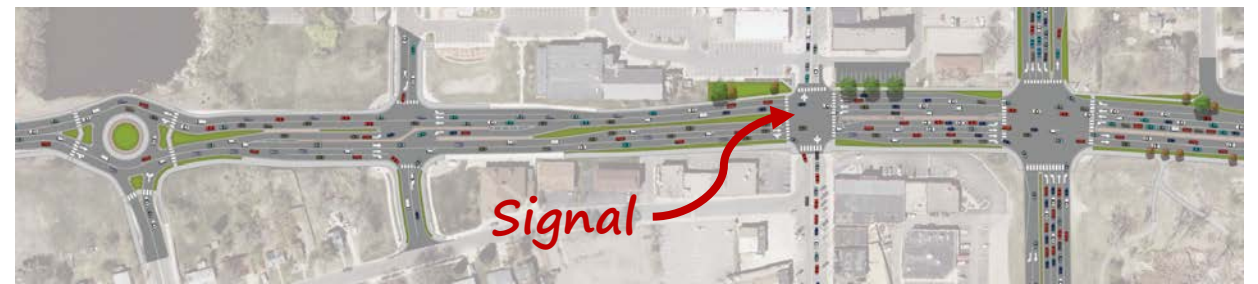
A-1 **Modified** Arcadia with Traffic Signal



A-HYBRID Arcadia with Traffic Signal at TH 13



A-2 Arcadia with Roundabout at TH 13



B-1 Main with Traffic Signal at TH 13



Public Engagement Summary

Key Channels

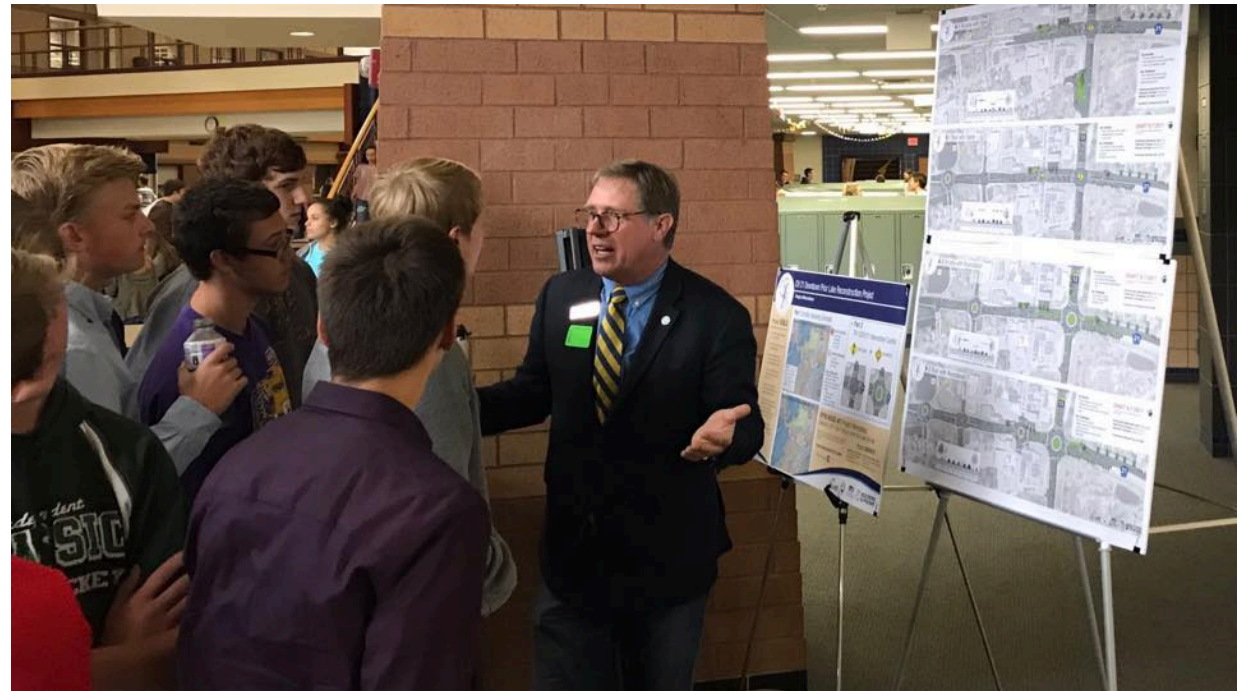
- Prior Lake High School Student Council Input
- SpeakUp Scott County Forum
- Stakeholder Engagement
 - Corridor Visioning Workshops
 - Community Organizations
 - Public Open Houses
- Local Roadway Assessment
- Individual Conversations



Prior Lake High School Student Council



- 2 Meetings with Executive Board
- Thursday, October 12th Event
 - Newsletter
 - Video
 - Pop-Up over lunch
 - Survey – 83 responses

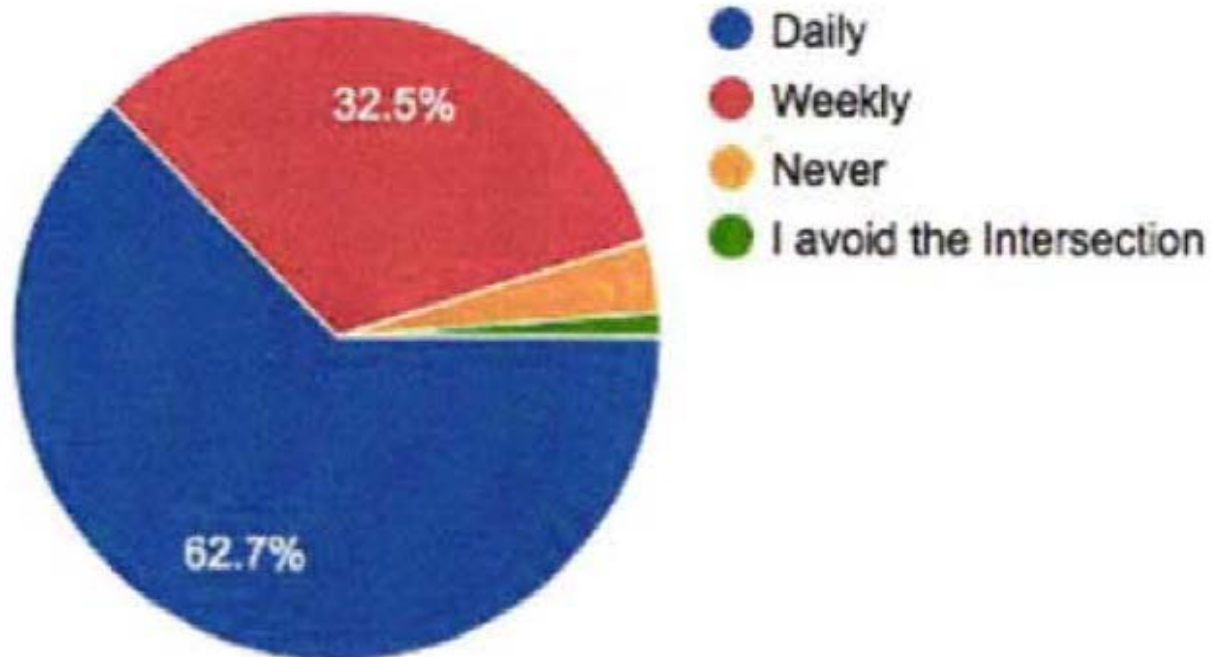




Prior Lake High School Student Council

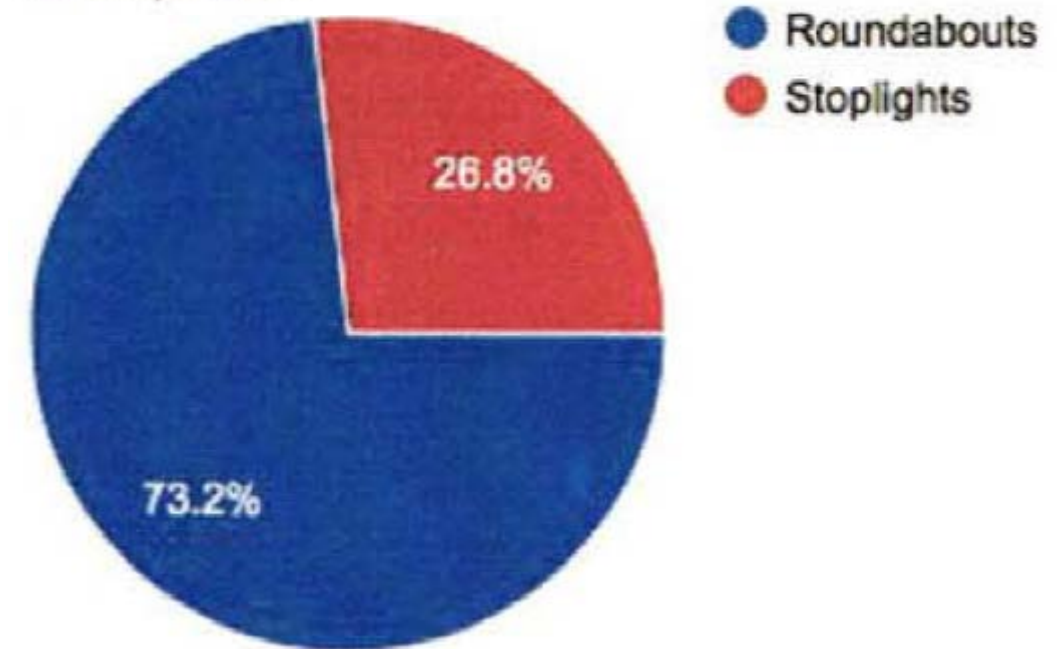
I drive through TH 13/CH 21...

83 responses



As a general opinion, I prefer

82 responses

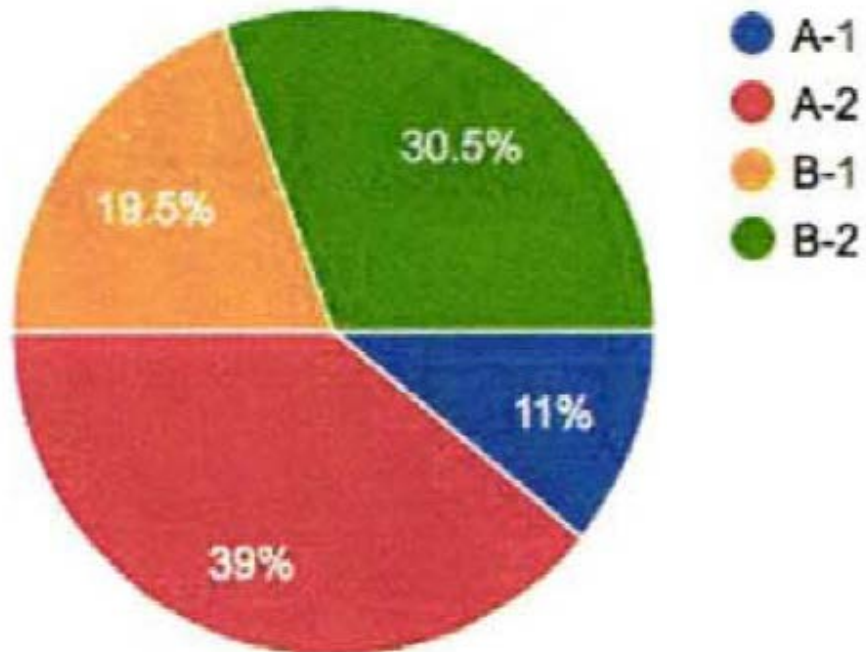




Prior Lake High School Student Council

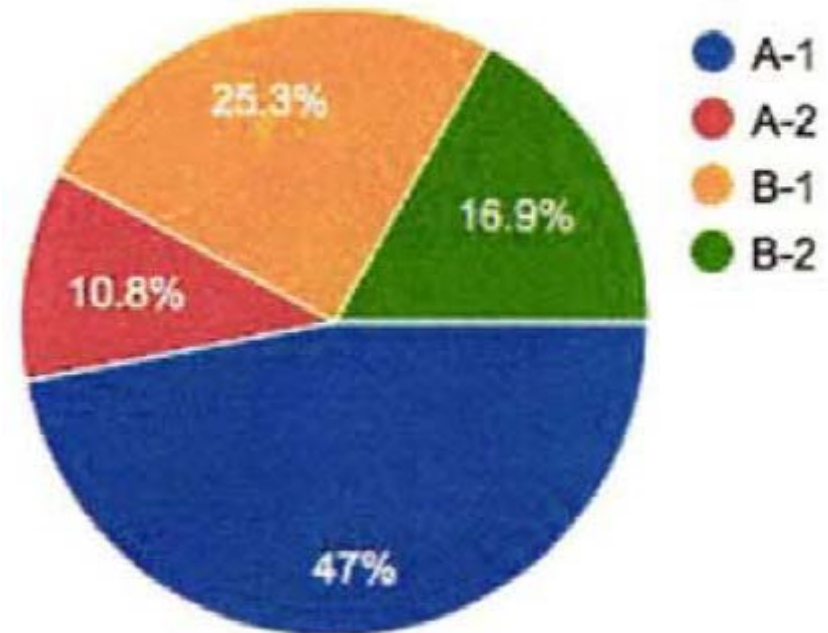
My favorite alternative is....

82 responses



My least favorite alternative is...

83 responses





Speak Up Scott County



- **3 Surveys:** Goals, Use, Alternatives
- **566 responses;** 1,152 Visitors

“Not sure if there is a "perfect" solution...How to keep traffic flowing, how to keep easy access to downtown, pedestrian and driver safety. Thank you for hearing us, this is a big decision on a tough project that will affect our community as we grow.”



If you were able to choose only one, which of the following should be the top priority for improvements to the 13-21 intersection?



Moving vehicles through the intersection more quickly and efficiently.

53.6% (126)

Creating a safe and comfortable environment for walkers and bikers.

7.2% (17)

Providing convenient access to local businesses and other local destinations.

17.4% (41)

Developing a cost effective infrastructure improvement plan.

11.1% (26)

Reflecting the character of Prior Lake with attractive landscaping, signage, et cetera.

3.8% (9)

Other

6.8% (16)

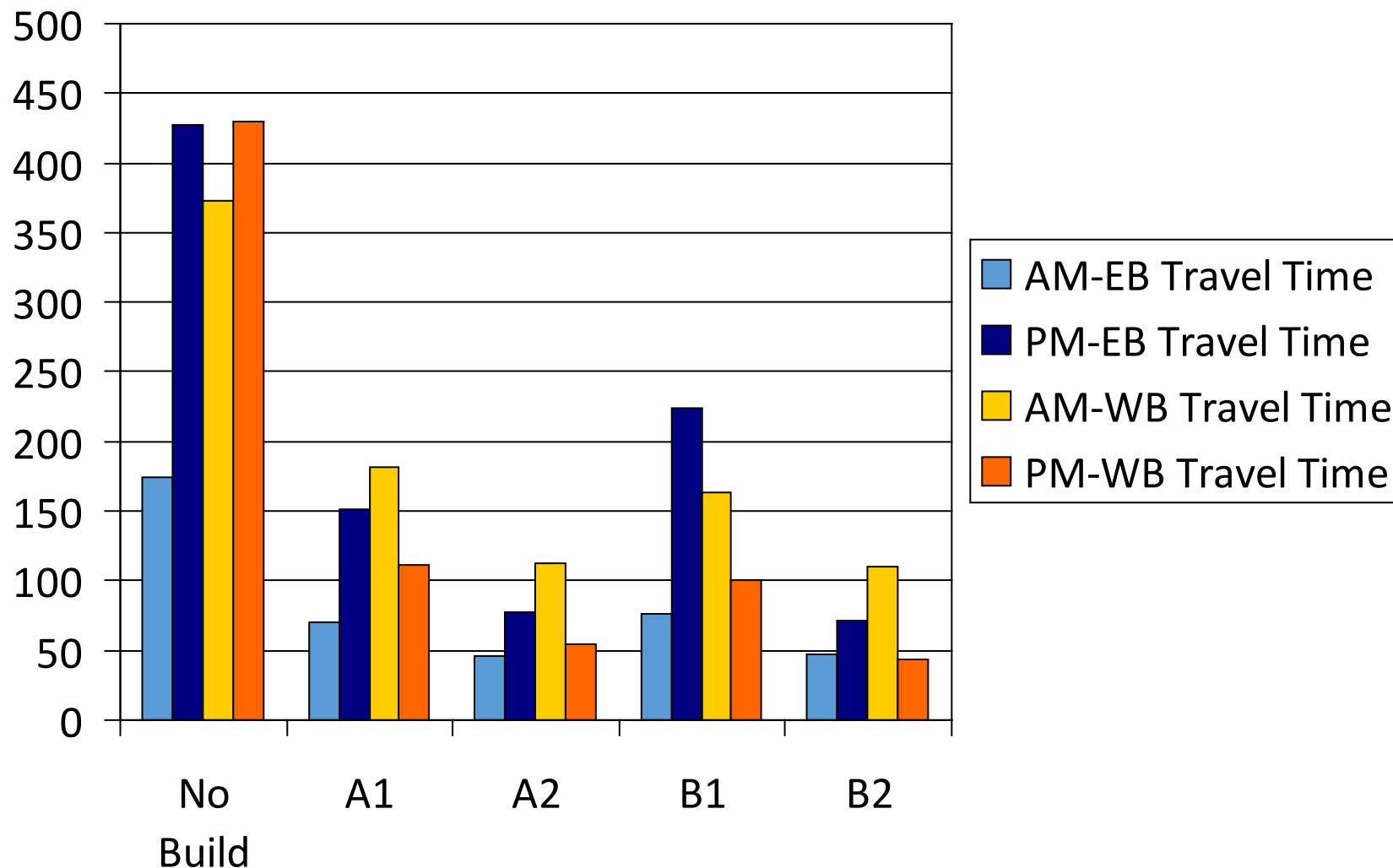
(235 total)



Estimated CH 21 2040 Travel Times

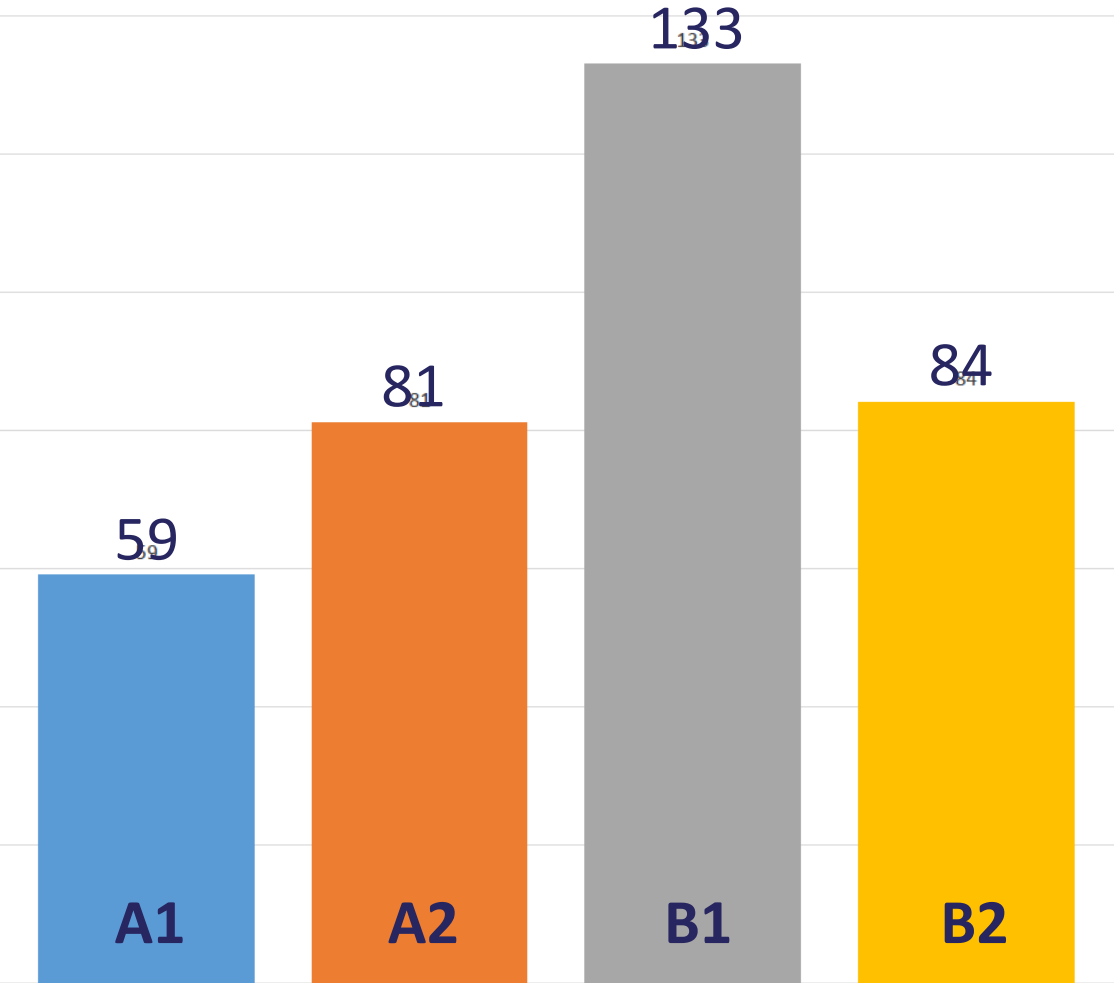
Duluth Ave through TH 13

Top Priority: Moving vehicles through the intersection more quickly and efficiently.





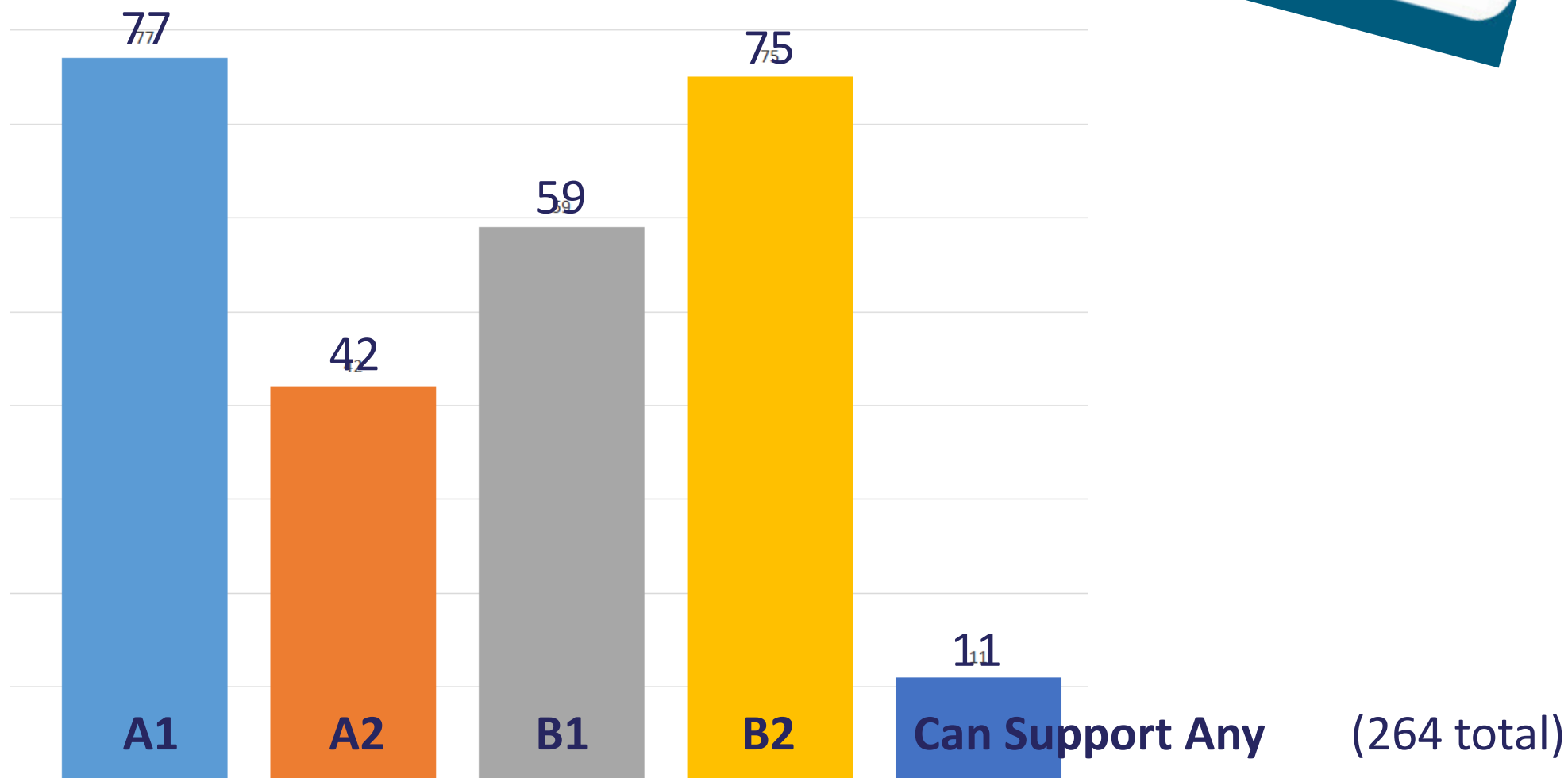
Which, if any, of the potential alternatives could you support?



(357 total)



Which of the potential alternatives could you not support?





Project Stakeholder Engagement

- 3 Corridor Visioning Workshops
 - Vision for Corridor
 - Roadway Considerations, Downtown Access, Opportunities
 - Alternatives SWOT Analysis
- Small Group Meetings
 - Prior Lake EDA/EDAC Workshop
 - Prior Lake Rotary Presentation
 - Talk of the Town Event





Individual Conversations



- Open House #2 – October 10, 2017
 - 60 people signed in
- 6 Pop-Up Meetings
- Individual Business Owners

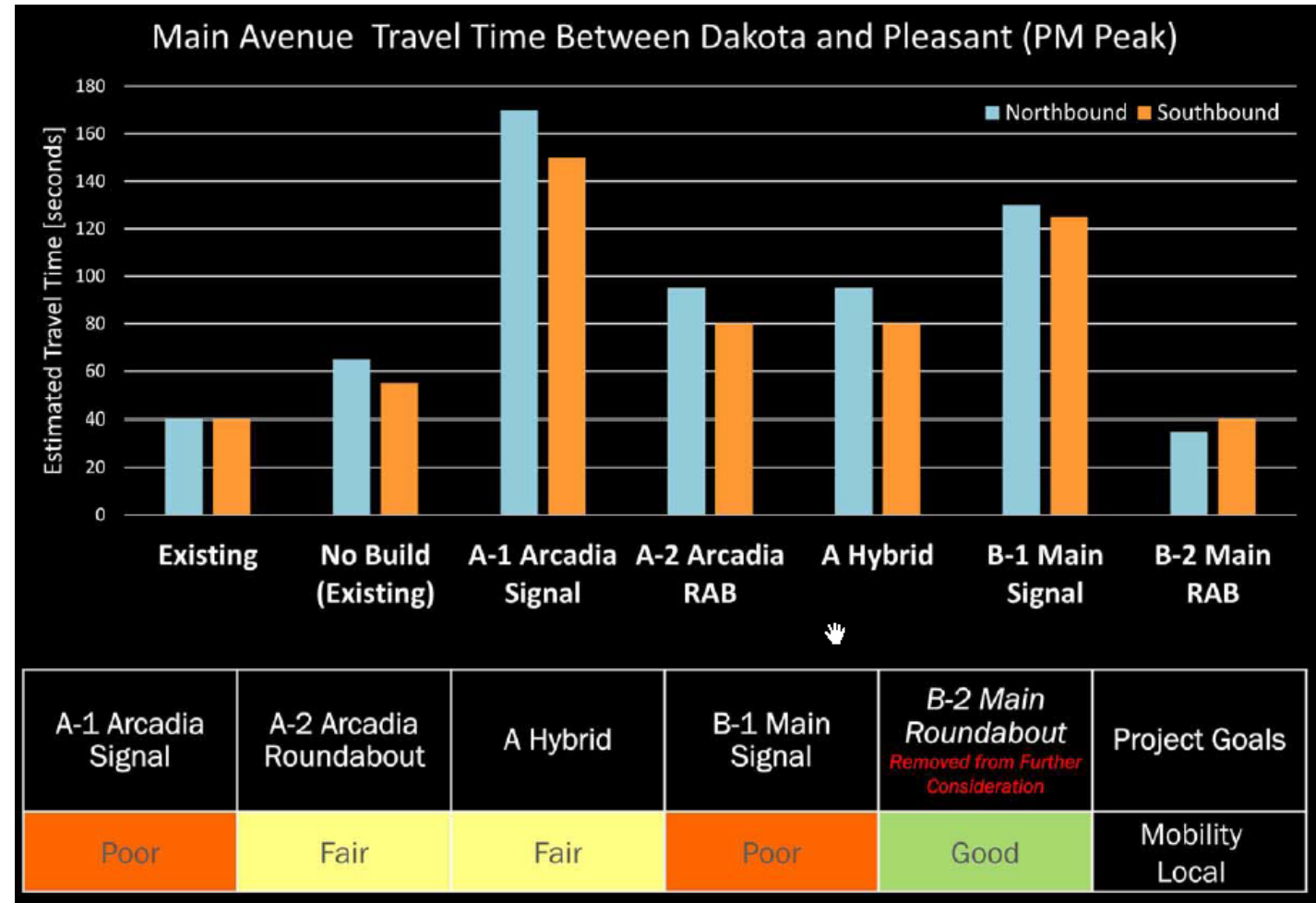




Local Roadway Assessment

SRF/City Council – October 16, 2017

- Travel Patterns
- Daily Traffic Volumes
- Local Roadway Crashes
- Pedestrian Network, Safety, & Delay
- Parking Access & Utilization
- Land Use & Growth
- Travel Time across Downtown
- Project Phasing
- Streetscape Opportunities
- Property Impacts





Local Roadway Assessment

SRF/City Council – October 16, 2017

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- Land Use & Growth
- Travel Time across Downtown
- Project Phasing
- Streetscape Opportunities
- Property Impacts

<div>SRF</div> <div>Alternative Evaluation Summary Matrix</div>						
Evaluation Criteria	A-1 Arcadia Signal	A-2 Arcadia Roundabout	A Hybrid	B-1 Main Signal	B-2 Main Roundabout <i>Removed</i>	Project Goals
Travel Pattern Changes	Good	Good	Good	Good	Good	Mobility Local
Driveway Impacts	Good	Good	Good	Poor	Poor	Character Mobility Local
Roadway Cross-Section/ Parking Impacts	Fair	Fair	Fair	Poor	Poor	Character Local
Corridor Travel Times	Fair	Good	Good	Fair	Good	Character Mobility Local
Main Ave Travel Times	Poor	Fair	Fair	Poor	Good	Mobility Local
Local Roadway Traffic Volumes	Fair	Fair	Fair	Fair	Fair	Mobility Local
Year 2040 Delays and Queues	Good	Good	Good	Poor	Fair	Mobility Local
Vehicular Safety	Fair	Fair	Fair	Fair	Fair	Safety Local
Pedestrian Safety	Good	Good	Good	Good	Fair	Non-Motorized) Safety Local
Land Use/ Downtown Growth	Good	Good	Good	Good	Fair	Feasibility Local
Planned Transportation Improvements	Good	Good	Good	Fair	Fair	Feasibility Local
Streetscape Opportunities	Good	Good	Good	Fair	Good	Character Local
Compatibility - Property Impacts	Fair	Fair	Fair	Poor	Poor	Feasibility Cost Local



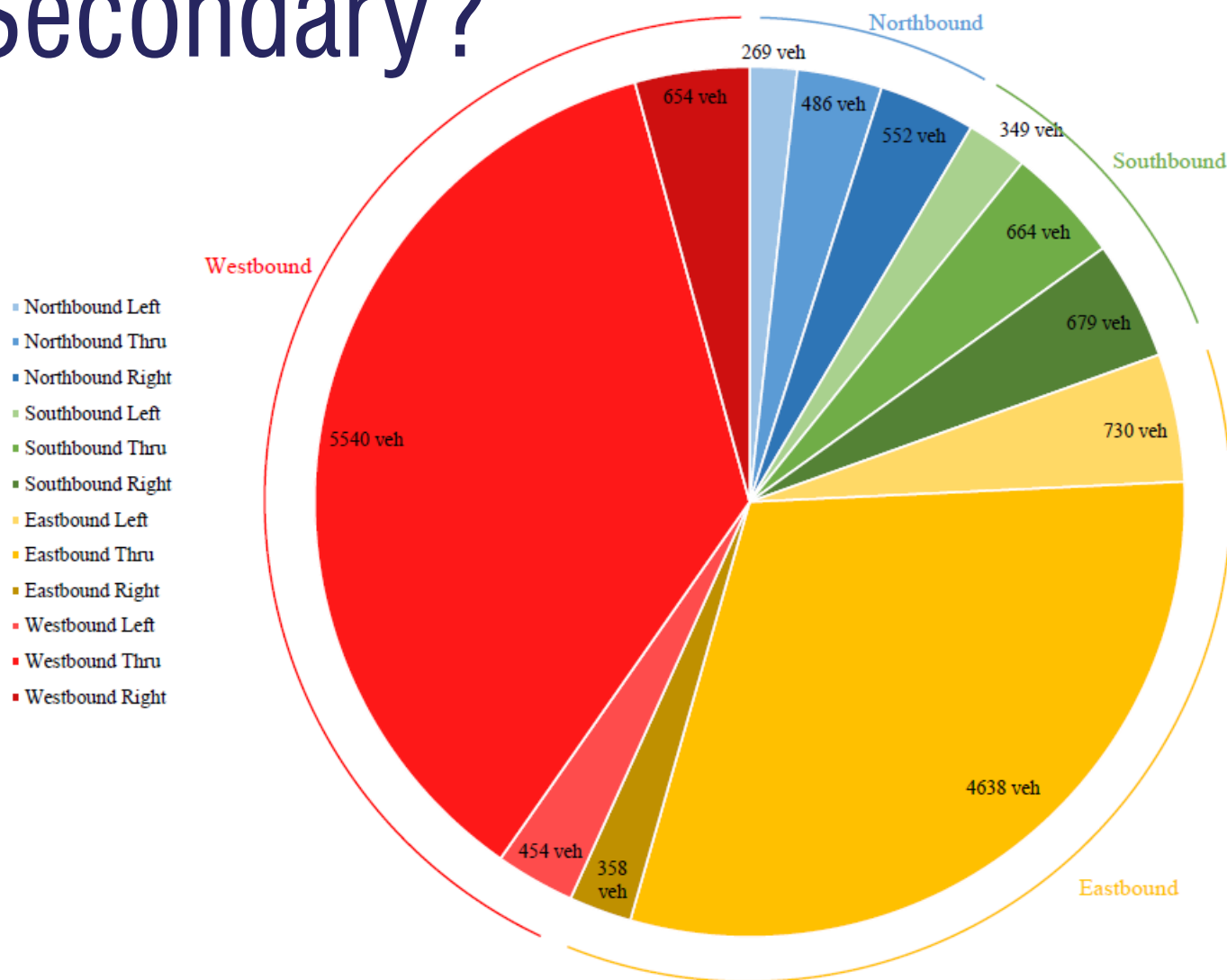
Main Avenue Primary or Secondary?

Alternative A-1 (Secondary -Right-in/Right-out)
19.2% of movements will be displaced at
 Main/CH21 (2,952 of 15,373).

Alternative A-2 (Secondary - Half $\frac{3}{4}$)
14.5% of movements will be displaced at
 Main/CH21 (2,222 of 15,373).

Alternative B-1 (Primary – Signal)
60% increase in delay for Main Avenue

CH 21 at Main Ave - 13 Hour Volumes





Main Avenue Primary or Secondary?



“In the interest of preserving the character of the town, it does not make sense to have one of the main roads in Prior Lake completely pass a road called "Main Street." It is important for local businesses that there continues to be easy access to Main Street.”

“I also believe that the Main St negativity is being driven by emotion of several downtown business people. If you ask privately, many business owners do not agree with the few emotional "leaders". Please make a decision that is good for the entire community...current and future!”

“The median will kill all business downtown.”

“Not super concerned with traffic controls (i.e. right-in-right-out) limiting my business. If people want to get to me, they will. Biggest concern is pedestrian travel functioning to allow as much foot travel as possible between downtown businesses.”



TH 13/CH 21 Operations

Signal or Roundabout?

Traffic Signal

Traffic Operations (2017)

- Intersection LOS D (40-54 sec/veh.)

Traffic Operations (2040)

- Intersection LOS E (55-79 sec/veh.)
- 2-3 hours of overall intersection operating at LOS E or worse

Roundabout

Traffic Operations (2017)

- Intersection LOS A (0-10 sec/veh.)

Traffic Operations (2040)

- Intersection LOS D (25-34 sec/veh.) – AM
- Intersection LOS B (10-14 sec/veh.) – PM
- 0 hours of overall intersection operating at LOS E or worse

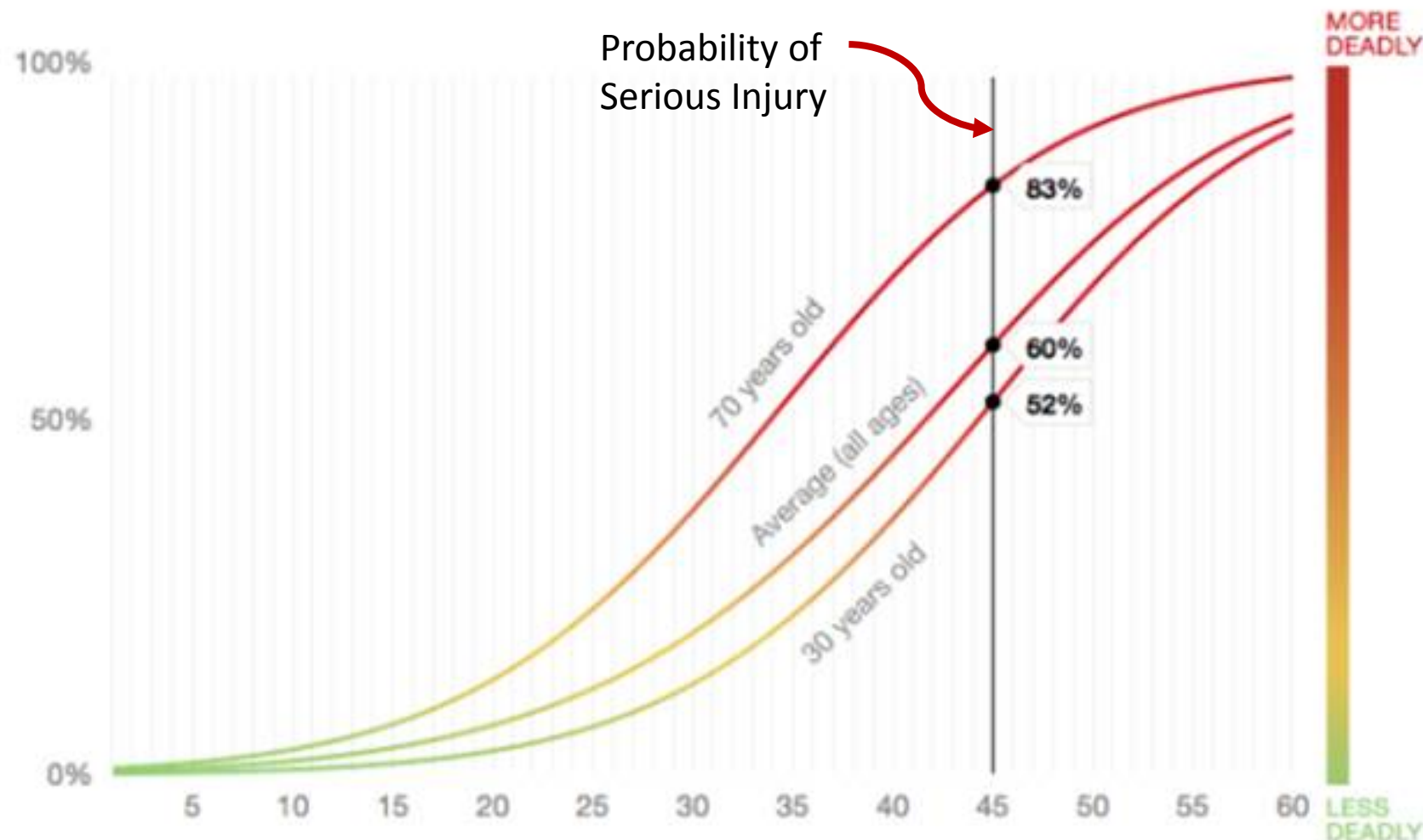
The roundabout alternative is expected to better accommodate both local and regional trips at the CH 21 at TH 13 intersection.



TH 13/CH 21 Pedestrian Safety Signal or Roundabout?

Vehicles traveling
at **45 mph**, our
design speed on
TH 13.

Source: AAA Foundation for Traffic
Safety (2011)

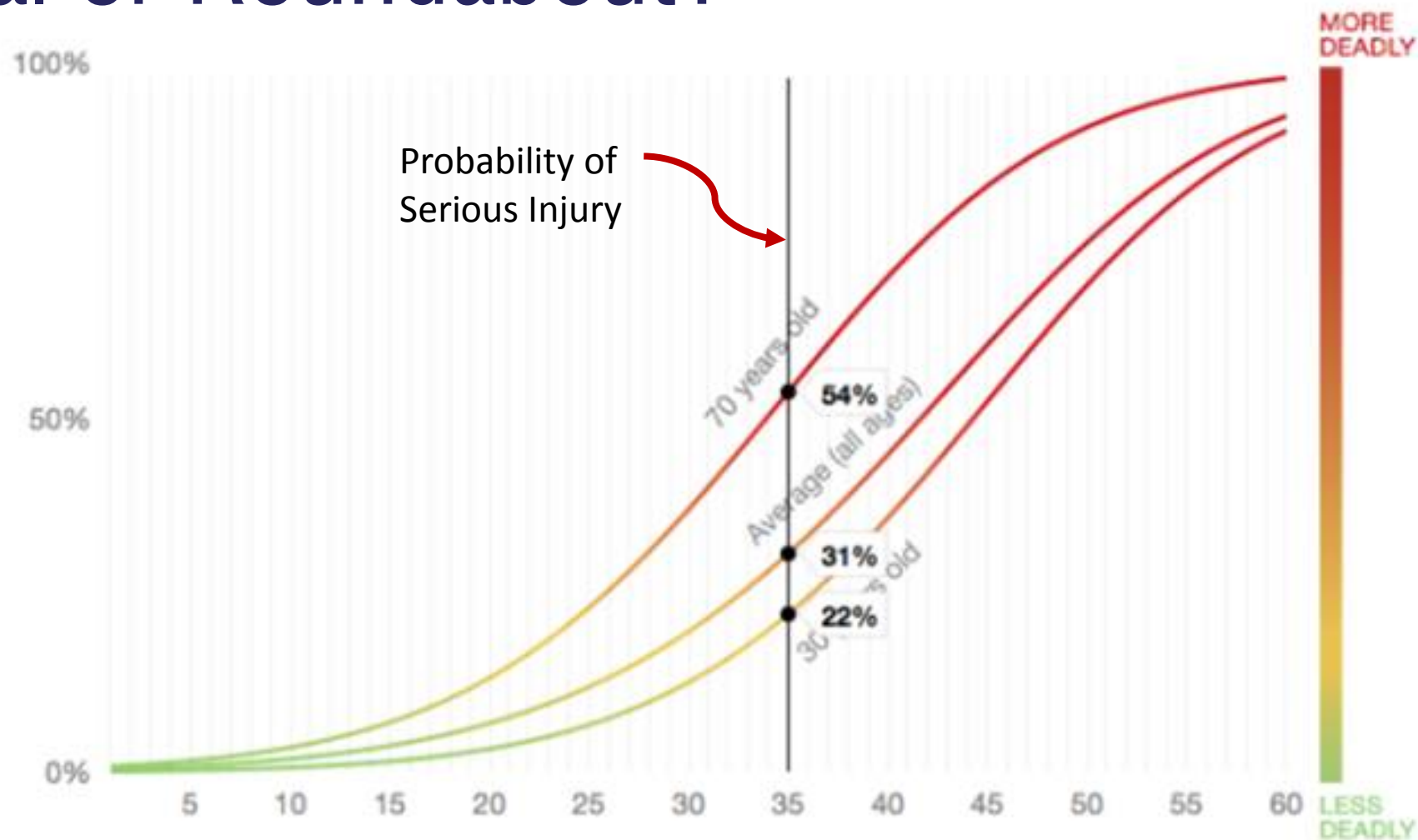




TH 13/CH 21 Pedestrian Safety Signal or Roundabout?

Vehicles traveling
at **35 mph**, our
design speed on
CH 21.

Source: AAA Foundation for Traffic
Safety (2011)

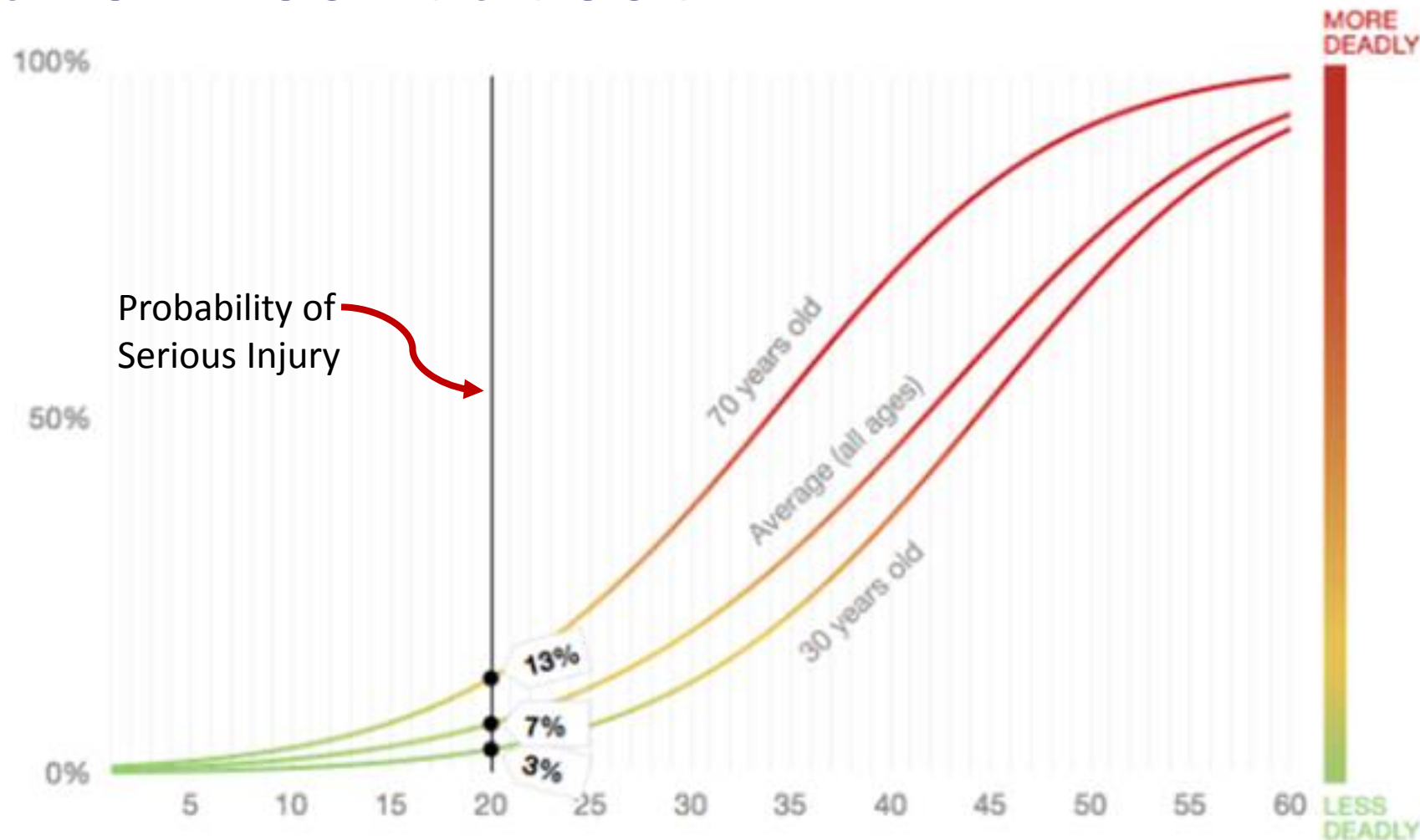




TH 13/CH 21 Pedestrian Safety Signal or Roundabout?

Vehicles traveling
at **20 mph**,
entrance and exit
design speed for
a roundabout
intersection.

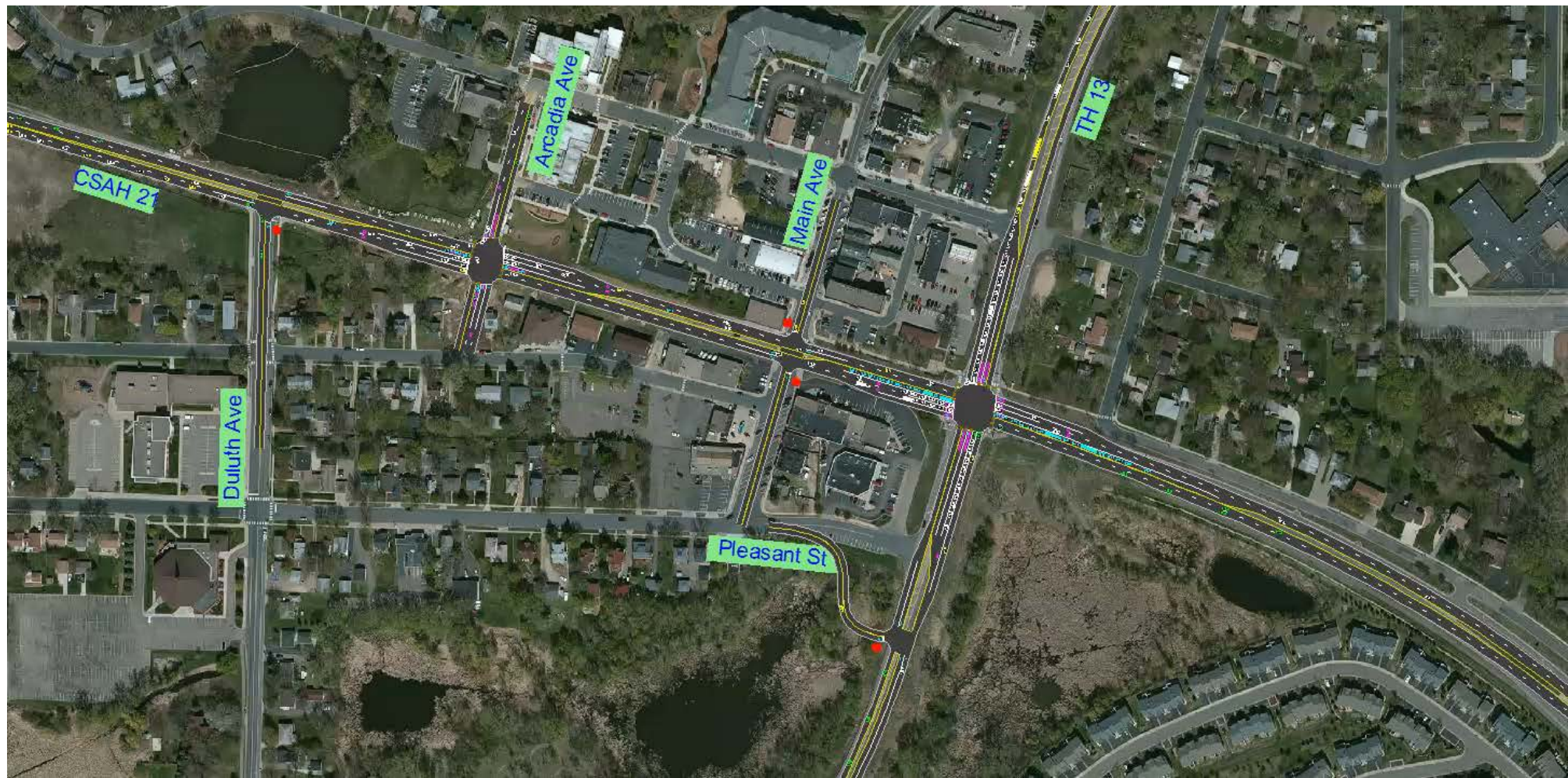
Source: AAA Foundation for Traffic
Safety (2011)





TH 13/CH 21 **A-1** Operations

Signal or Roundabout?



2040 PM Peak



TH 13/CH 21 **A-2** Operations

Signal or Roundabout?

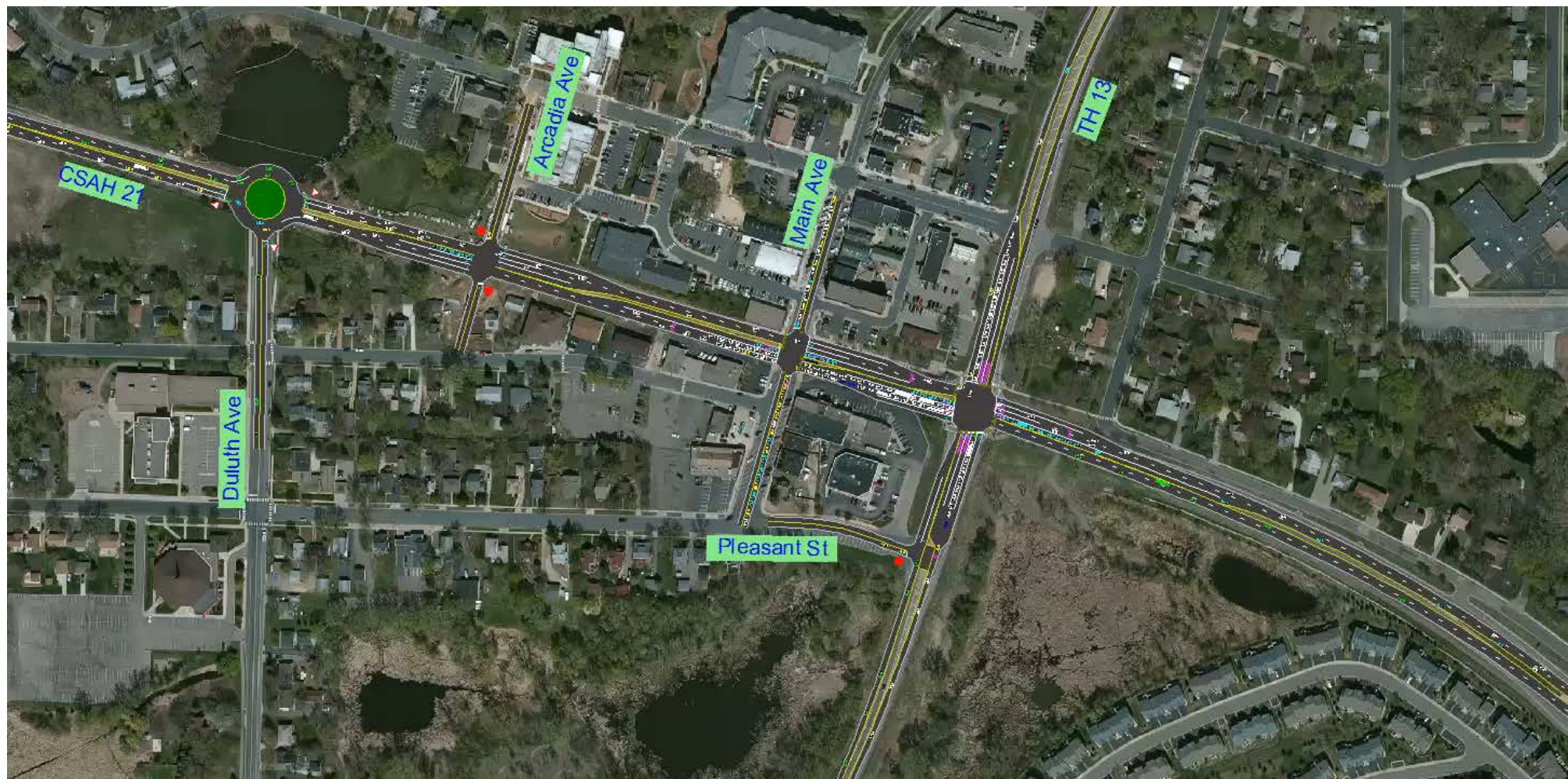


2040 PM Peak



TH 13/CH 21 **B-1** Operations

Signal or Roundabout?



2040 PM Peak



TH 13/CH 21

Signal or Roundabout?



At 13/21 the traffic is just too heavy to be handled by a roundabout.

“I believe a stoplight at 13 will not work. The state cares only about 13 traffic and will time the light for 13 and 21 will suffer.”

“A roundabout for 13 and 21 would have way too much traffic for that to safely work and the drivers (or at least I) am watching the traffic so much it is hard to see pedestrians.”

“A roundabout is the most efficient way to move traffic through the 13/21 intersection. A traffic light is not. However, it's also the most dangerous for walkers, joggers and cyclists to navigate - even if there are marked crosswalks...”



Multilane Roundabout Lessons Learned Mankato

Case Study 1 – TH 22 at Madison Avenue in Mankato

**Daily Traffic
Volumes**



*TH 13/CH 21 currently serves 27,500 VPD and is expected to serve 37,250 VPD in 20 years.

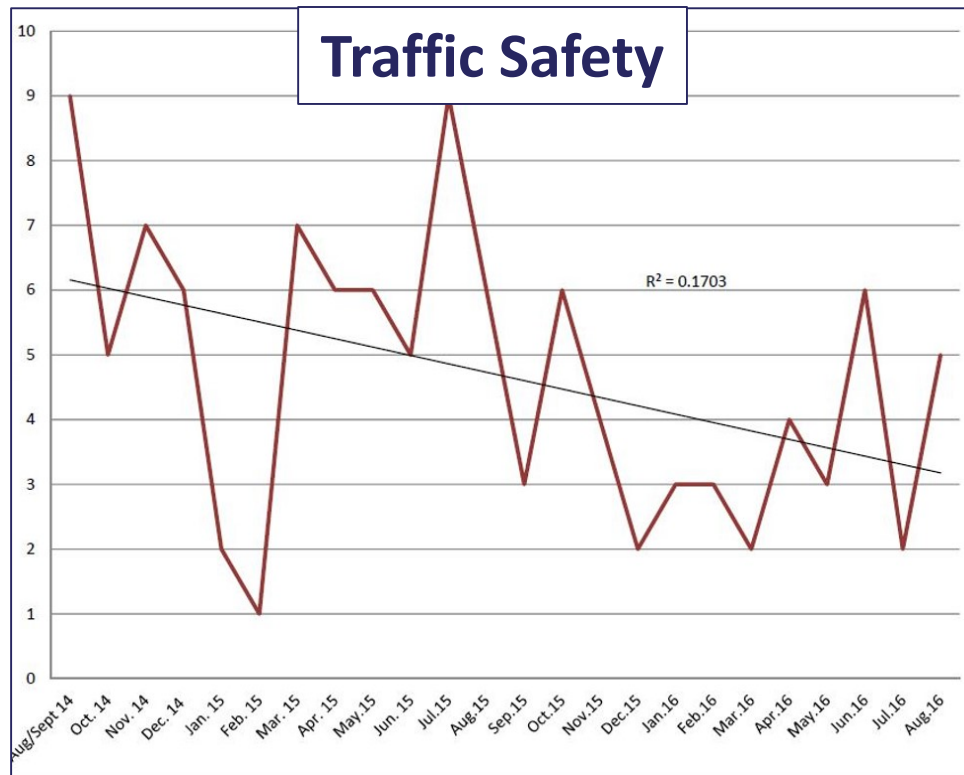


Image obtained from Google Maps



Multilane Roundabout Lessons Learned Mankato

Case Study 1 – TH 22 at Madison Avenue in Mankato



CRASHES PER MONTH →

Traffic Operations

“The roundabout has exceeded everyone’s expectations for delay reduction. For those that still don’t believe roundabouts are a good solution (anywhere) the one thing they can agree on is that they do get (traffic) through the intersections much more quickly than before with the signals.”

“From my observations pre and post construction, we’ve created a much more friendly crossing environment for pedestrians.”

- MnDOT District Traffic Engineer

*Vehicle crashes have been trending downward in the two years since the opening of the roundabout. No serious injury crashes occurred at the intersection during this time period.



Multilane Roundabout Lessons Learned Lakeville

Case Study 2 – CH 50 (Kenwood Tr) and CH 60 (185th St) in Lakeville

Daily Traffic Volumes



*TH 13/CH 21 currently serves 27,500 VPD and is expected to serve 37,250 VPD in 20 years.

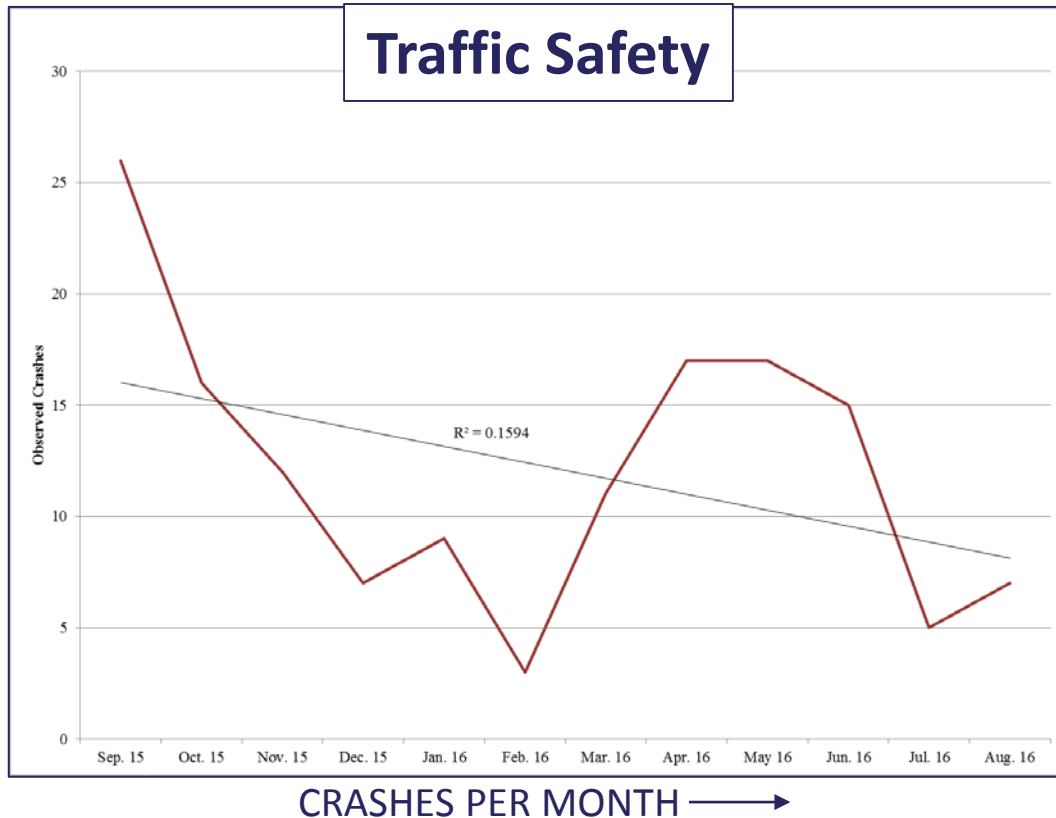




Multilane Roundabout Lessons Learned Lakeville

Case Study 2 – CH 50 (Kenwood Tr) and CH 60 (185th St) in Lakeville

Traffic Safety



Traffic Operations

Traffic Modeling (Opening Day):

- 4-5 seconds of delay per vehicle expected during peak conditions

Field Observations (October 2017)

- 8-13 seconds of delay per vehicle observed during peak conditions for southbound movement
- 7-21 seconds of delay per vehicle observed during peak conditions for westbound movement

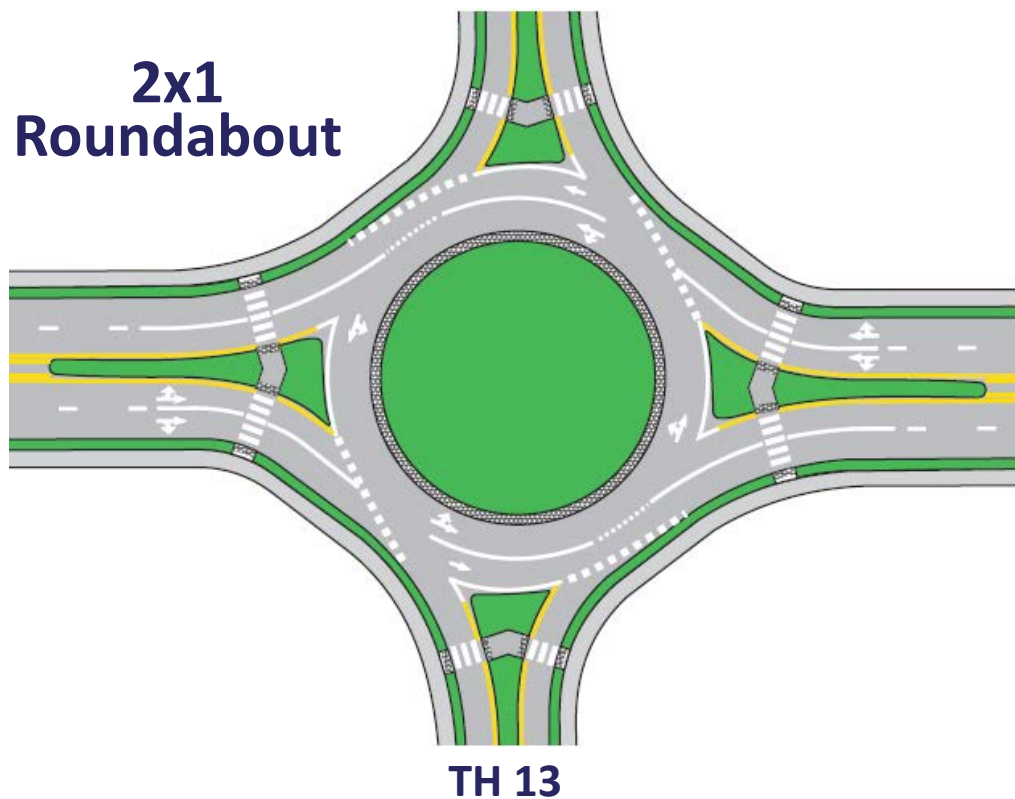
*Vehicle crashes have been trending downward since the opening of the roundabout. While 145 crashes occurred in the first year, no serious injuries were observed.



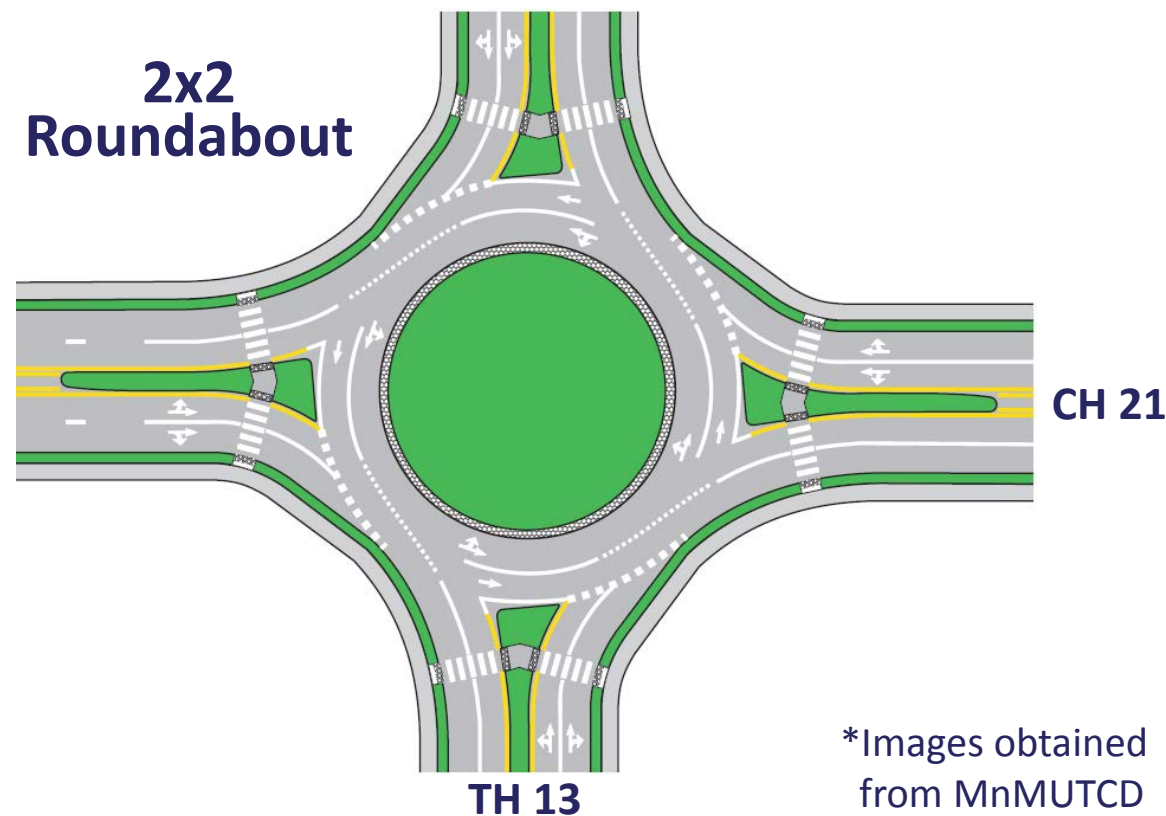
Multilane Roundabout Lessons Learned

MnDOT Metro Traffic and Central Office

**2x1
Roundabout**



**2x2
Roundabout**



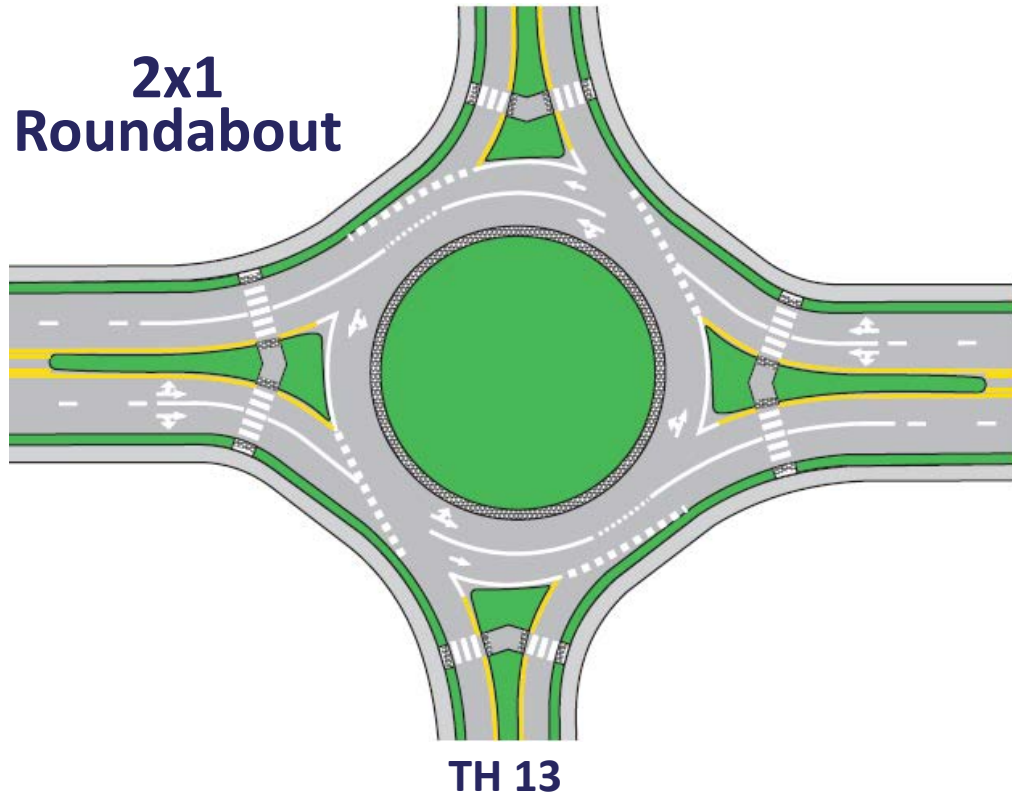
*Images obtained
from MnMUTCD



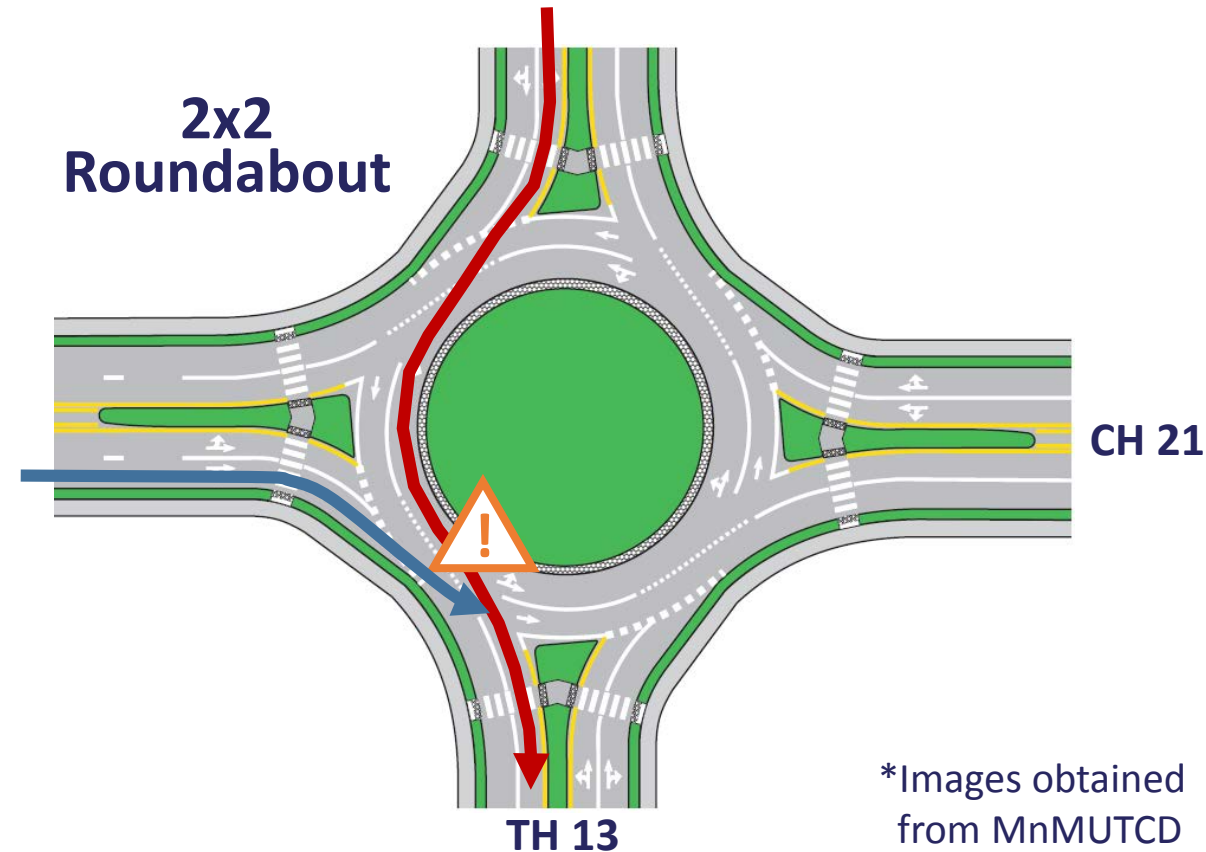
Multilane Roundabout Lessons Learned

MnDOT Metro Traffic and Central Office

**2x1
Roundabout**



**2x2
Roundabout**



*Images obtained
from MnMUTCD



Multilane Roundabout Lessons Learned

Construction Staging Alternatives

Roundabout

Under Traffic - \approx 15-18 weeks

Full Closure - \approx 6-8 weeks

Signal

Under Traffic – \approx 18-20 weeks

Full Closure - \approx 8-10 weeks

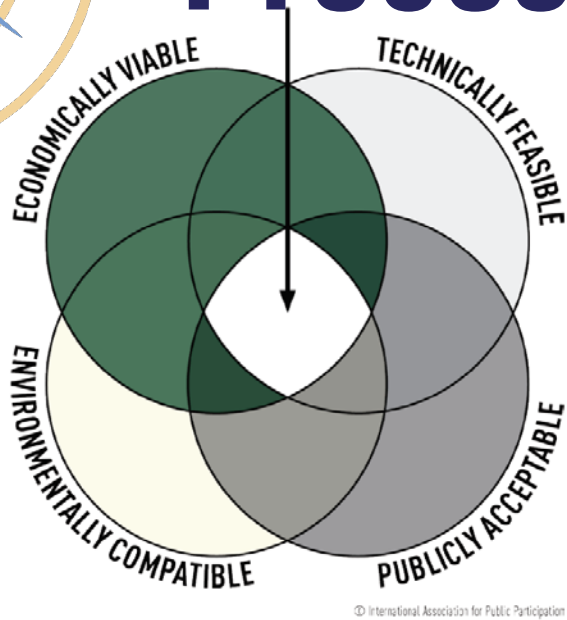


TIME-LAPSE CONSTRUCTION VIDEO

<https://www.youtube.com/watch?v=oa-u85iYyoc>



Next Steps / Decision-Making Process



- Continue MnDOT Coordination on TH 13 Intersection Control Alternatives
- Project Management Team Recommendation – October 31, 2017
- City Council Work Session / Regular Meeting – November 6, 2017
 - Request resolution of support for PMT Recommendation
- Begin Design and Property Acquisition

Define **WHAT** to Build

Preliminary Design

May - December 2017



Define **HOW** to Build

Final Design

January - December 2018



Build

Construction

May - October 2019