US 12
Road Safety Audit

Post-Audit Presentation

August 6, 2015

© 2015 HDR, Inc., all rights reserved.

Agenda

01 Background

02 Short-Medium-Long Term Safety Solutions

03 Comments and Questions

We all have a stake in A B

Goals of a Road Safety Audit (*RSA*)

#1: Eliminate Fatal and Serious Injuries (K's+A's)

- State Performance Measures
- Toward Zero Deaths (TZD)

#2: Reduce Total Crashes

- Number
- Severity

Multi-dimensional Approach to Safety

- Part of TZD
- 4 E's: Engineering, Enforcement, Education, Emergency Medical and Trauma Services

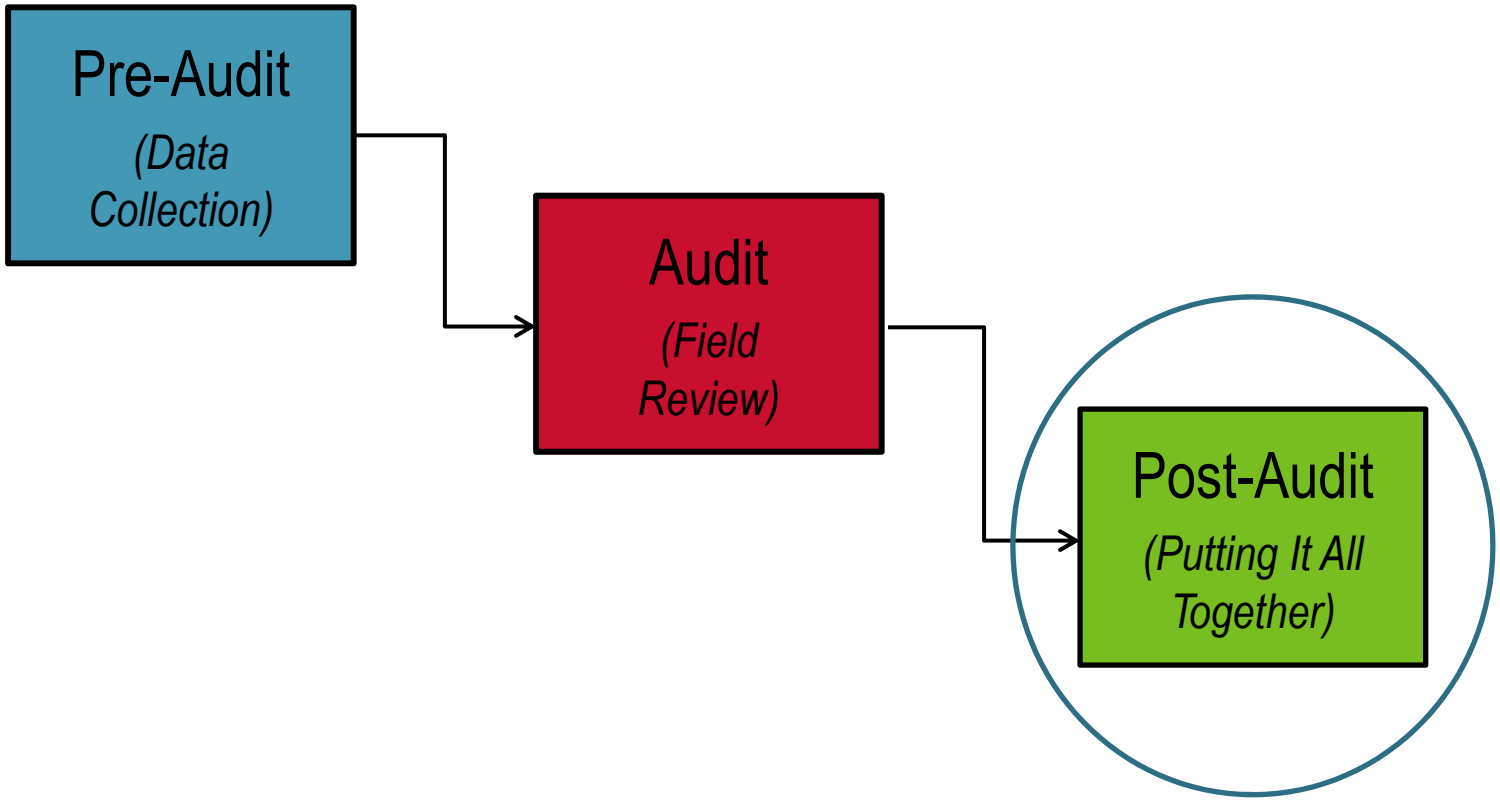
Provide Recommendations

- Short, Medium, and Long-Term Solutions

TOWARD ZERO DEATHS

Photo Source: "Minnesota's Toward Zero Death Program" – RDC Transportation Planners Meeting (May 16, 2011)

RSA Process


Pre-Audit
(Data Collection)
Audit
(Field Review)
Post-Audit
(Putting It All Together)

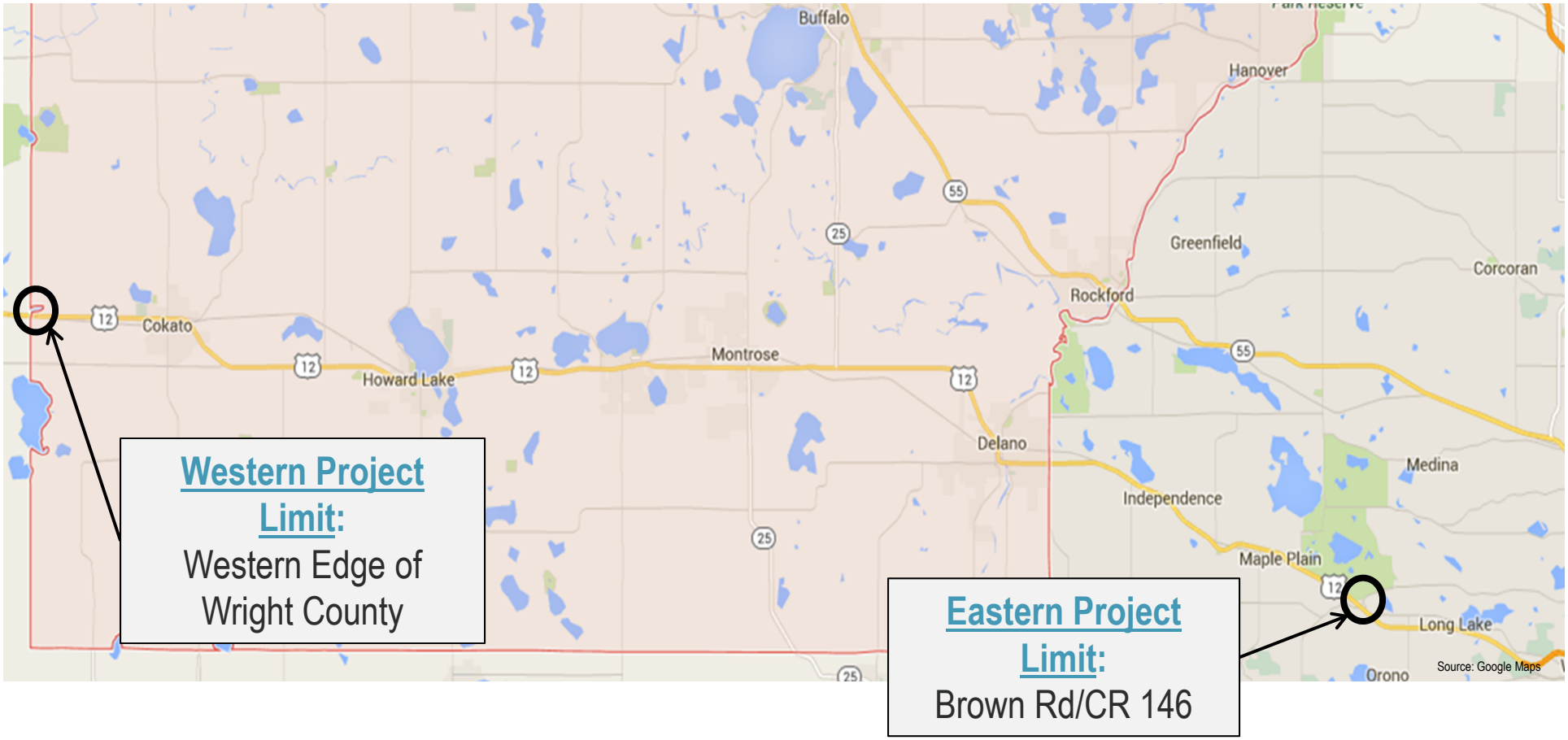
Road Safety Audit Team

Name	Agency and Position
Derek Leuer	MnDOT, Traffic Safety Engineer
Scott Thompson	MnDOT District 7 (Mankato), Traffic Engineer
Jim Rosenow	MnDOT, State Design Flexibility Engineer
Melissa Barnes	MnDOT, Bicycle and Pedestrian Engineer
Brad Estochen	MnDOT, State Traffic Safety Engineer
Will Stein	FHWA Safety Engineer (Minnesota Division)
Gary Kroells	West Hennepin Public Safety Department, Director (Leader of the Highway 12 Coalition)
Sgt. Rick Denneson	West Hennepin Public Safety Department, Sgt.
Brandi Popenhagen	HDR, Project Manager
Natalie Lindsoe	HDR, Project Engineer
Bernie Arseneu	HDR, Global Traffic Director

Advantages of Lower Cost, Higher Benefit Strategies:

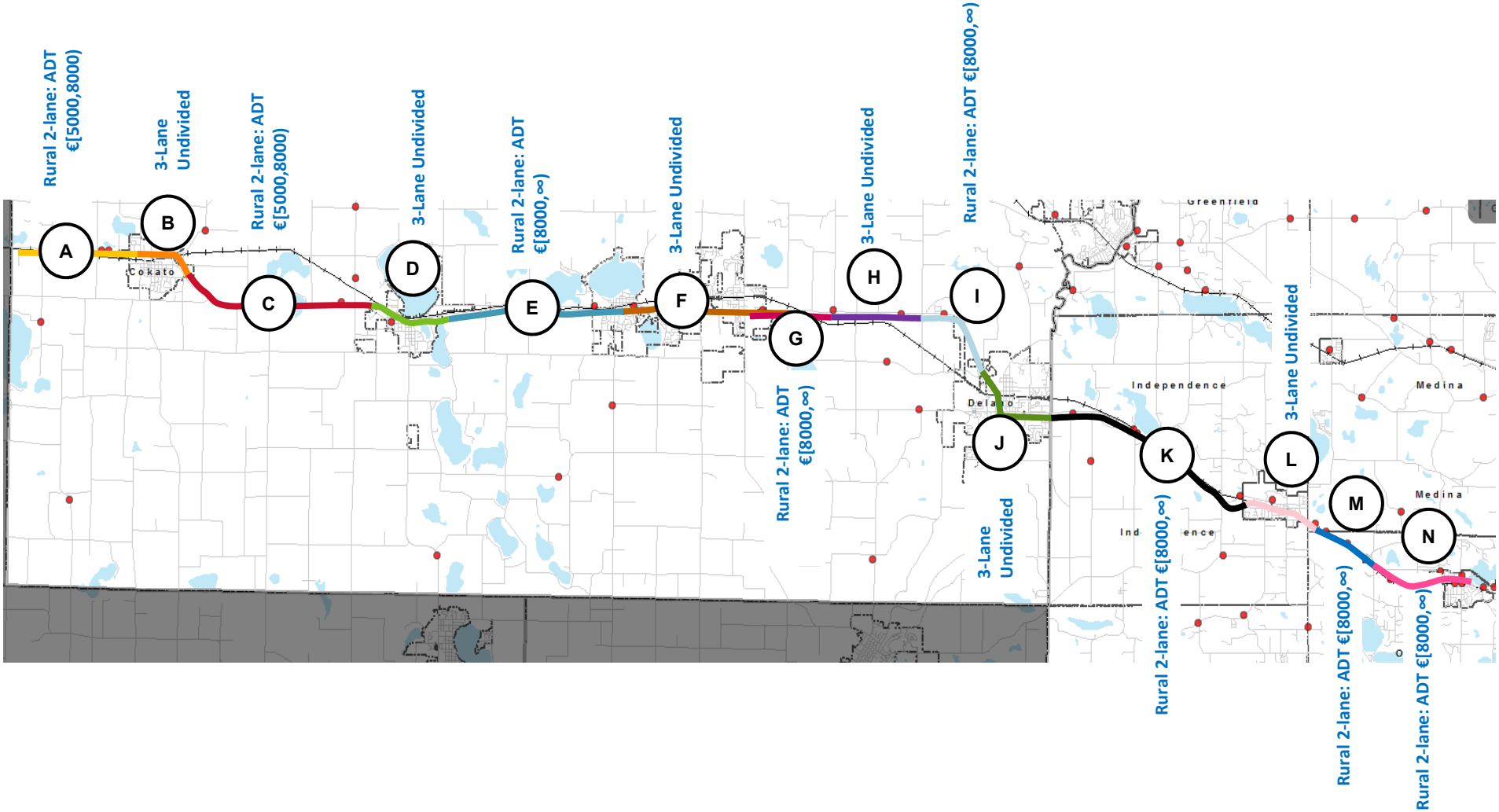
- ✓Install on a faster timeline
- ✓Strategically fix the system
- ✓Address the funding gap and today's funding reality
- ✓Build to a maintainable scale
- ✓Leverage public funds to achieve multiple purposes
- ✓Recognize engineering alone can't address safety issues
  - Enforcement, Education, EMS, Coalitions/Partnerships/Etc., Everyone

Material Source: Minnesota's Toward Zero Death Program – RDC Transportation Planners Meeting (May 16, 2011)



US 12 Road Safety Audit - Study Area Limits

Segments


Rural 2-lane: ADT €[5000,8000)
A
3-Lane Undivided
B
Cokato
Rural 2-lane: ADT €[5000,8000)
C
3-Lane Undivided
D
Rural 2-lane: ADT €[8000,∞)
E
3-Lane Undivided
F
Rural 2-lane: ADT €[8000,∞)
G
3-Lane Undivided
H
Rural 2-lane: ADT €[8000,∞)
I
3-Lane Undivided
J
Rural 2-lane: ADT €[8000,∞)
K
Independence
3-Lane Undivided
L
Rural 2-lane: ADT €[8000,∞)
M
Medina
Rural 2-lane: ADT €[8000,∞)
N
Medina

Trends/Observations

- Most Fatal/Incapacitating crashes were head-on collisions
- Speeding is an issue in most Urban segments
- Congestion-related crashes (i.e. rear end collisions) are an issue in AM and PM peak hours
- Right angle collisions frequently attributed to sightline issues, driver inattention

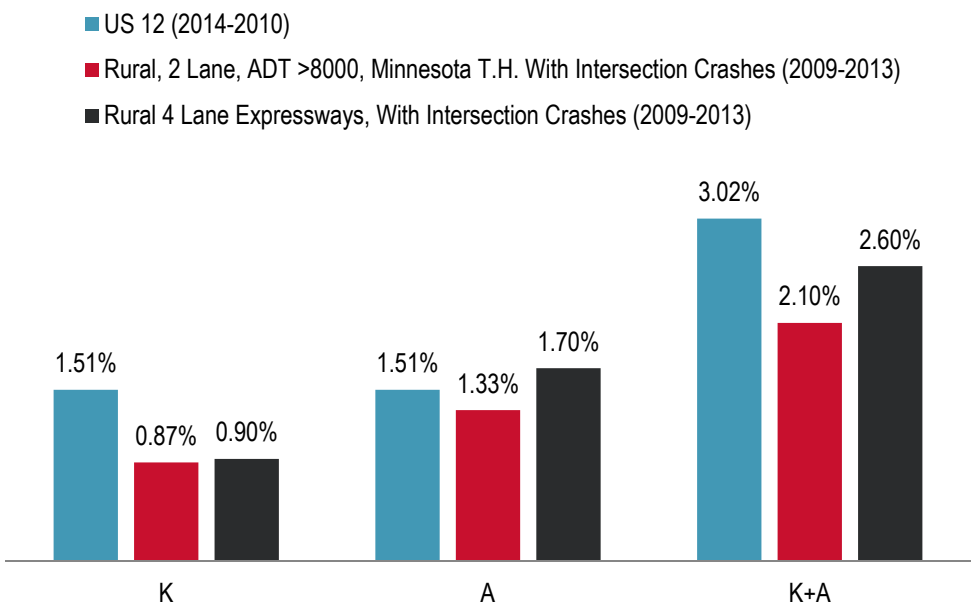
	All Crashes		K+A	
Diagram	**Number**	**[%]**	**Number**	**[%]**
Rear End	**203**	**38%**	2	13%
Sideswipe Passing	20	4%	0	0%
Left Turn into Traffic	25	5%	0	0%
Ran Off Road-Left Side	34	6%	1	6%
Right Angle	**92**	**17%**	0	0%
Right Turn into Traffic	4	1%	0	0%
Ran Off Road-Right Side	47	9%	0	0%
Head On	50	9%	**10**	**63%**
Sideswipe Opposing	13	2%	0	0%
Other	33	6%	3	19%
Not Applicable	6	1%	0	0%
Unknown	3	1%	0	0%

US 12 Crash Data Source: 2010-2014 Minnesota TIS Crash Data

Trends/Observations

- **Crash Severity:** 66% of all crashes were property damage only. Approximately 4% of crashes were fatal or incapacitating (K+A).

Figure 2-4: Percentage of Fatal (K) and Severe (A) Crashes - US 12 vs. Statewide Averages



Trends/Observations

Surface Conditions

- **Dry Condition:** *69% of all crashes, 63% of K+A crashes*
- **Snow/Icy Conditions:** *32% of K+A crashes*

Diagram

- **Rear Ends:** *38% of all crashes, 13% of K+A crashes*
- **Right Angles:** *17% were right angles.*
- **Head On:** *63% of K+A crashes*

Type of Crash

- **Motor Vehicles in Transport:** *71% of all crashes, 69% of K+A crashes*
- **Fixed Objects:** *14% of all crashes*

Relation to Junction

- **Non-Junction:** *46% of all crashes, 69% of K+A crashes*
- **T-intersections:** *25% of K+A crashes*

Location of Crash

- **Independence:** *23% of all crashes, 25% of K+A crashes*
- **Maple Plain:** *18% of all crashes*
- **Delano:** *16% of all crashes*
- **Waverly/Montrose:** *19% of K+A crashes*
- **Cokato:** *13% of K+A crashes*

Time of Crash

- Majority of all crashes occurred during **AM and PM peak hours**.
- No K+A crashes occurred between 11:00 PM and 7:59 AM.

Rural Segments

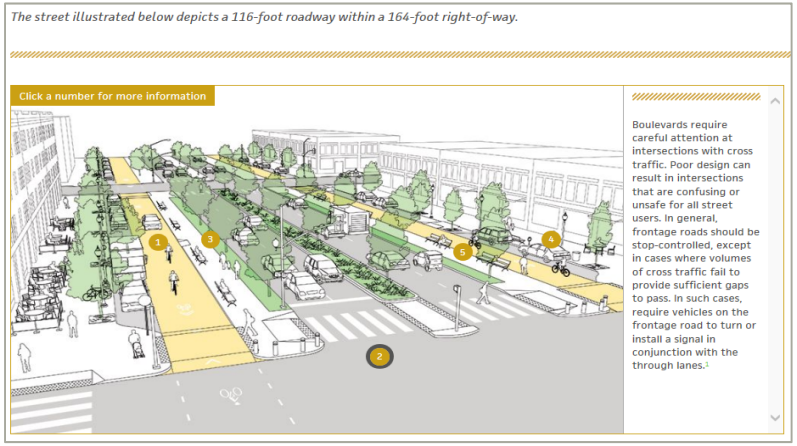
Recommended Solutions

Short (0-5yrs)	Medium (5-10yrs)	Long (10+yrs)
• Centerline Rumble Strips • Edgeline Rumble Strips	• Center Buffer Strips	• 2+1

Urban Segments

Recommended Solutions

Short (0-5yrs)	Medium (5-10yrs)
• Public outreach for Complete Streets solutions (Road Diet) • Pedestrian bump outs/Curb extensions • Sidewalk network plans • Mumble Strips	• Implement Complete Streets Solutions (Road Diet) • Install sidewalks on both sides of the street

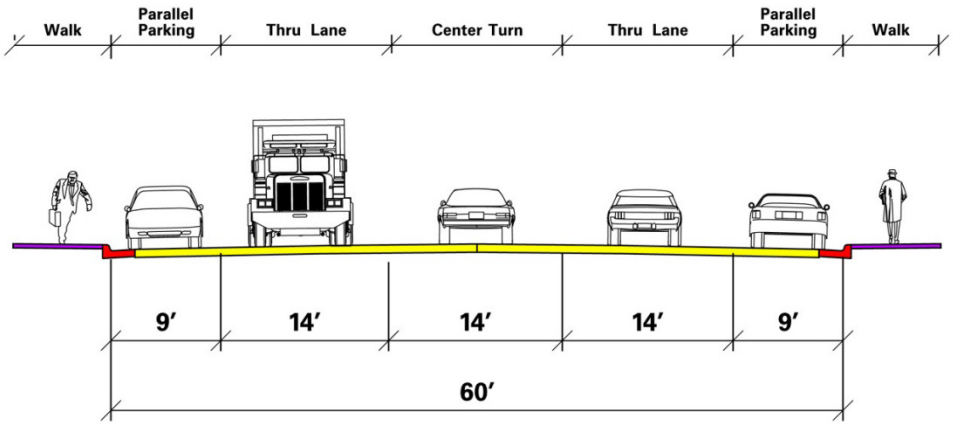


NACTO's Urban Street Design Guide Web Link: http://nacto.org/publication/urban-street-design-guide/

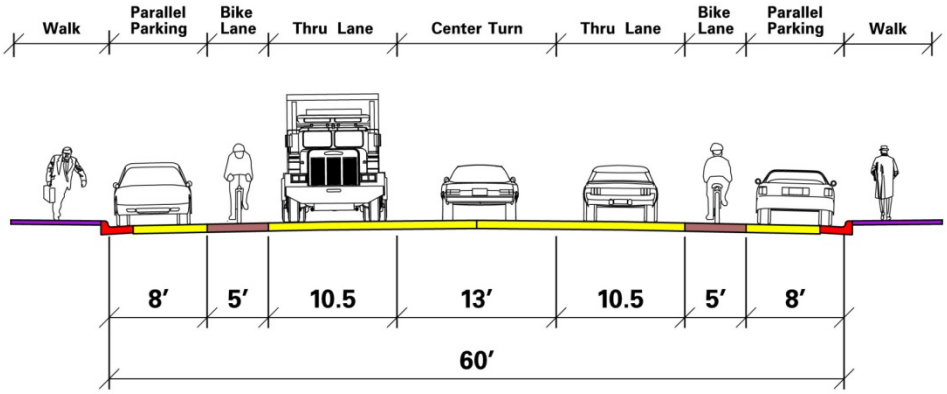
Complete Streets Example #1

Preservation Retrofit in Jordan, MN

Existing Condition

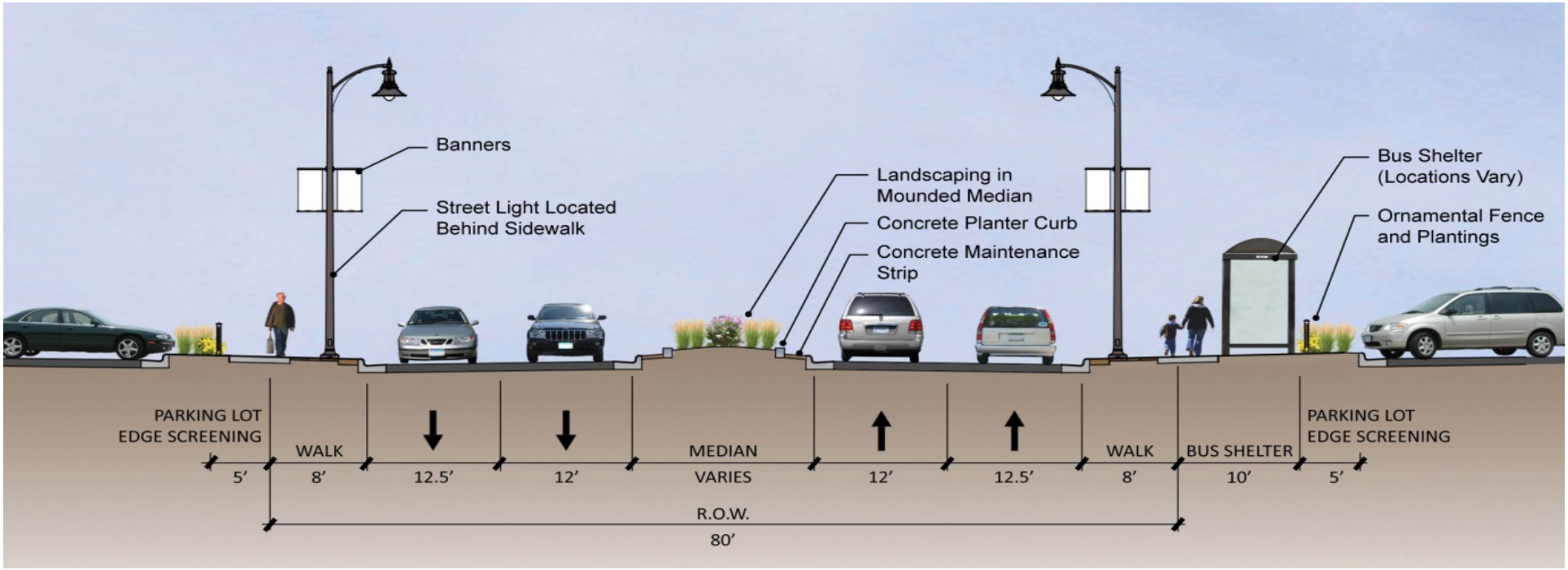


Proposed Condition

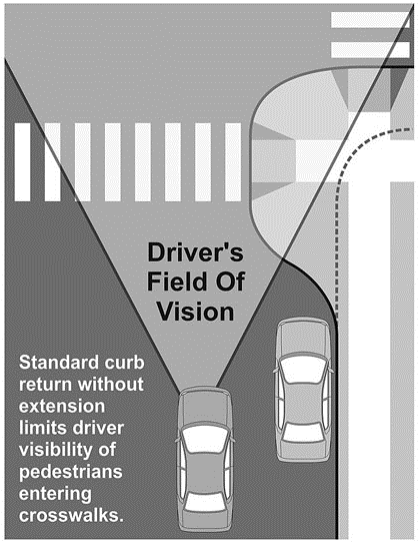


Complete Streets Example #2

Improvements on Robert Street (St. Paul, MN)



Curb Extensions



http://sf.streetsblog.org/category/san-francisco-neighborhoods/district-6/

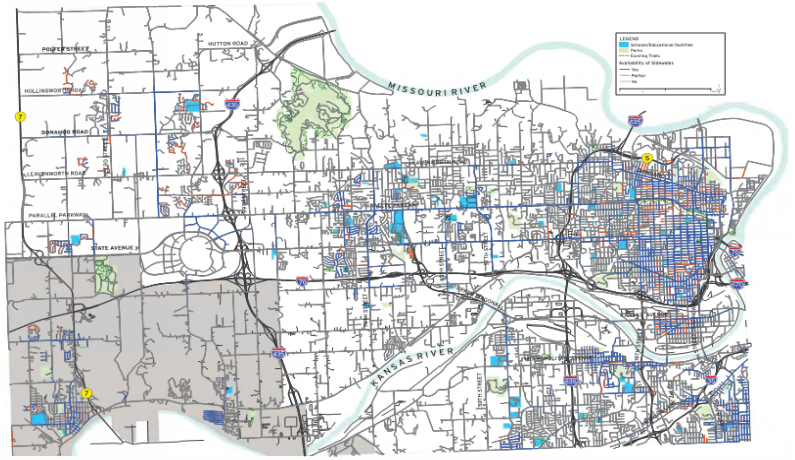
http://www.streetsblog.org/2014/08/01/dot-proposes-road-diet-after-west-end-avenue-deaths/

Sidewalk Network Plans

Existing Sidewalks

The sidewalk field analysis was completed in early December of 2011. Approximately 1,801 miles of public sidewalks were inventoried during the field analysis. The exhibit below shows existing and partial sidewalks.

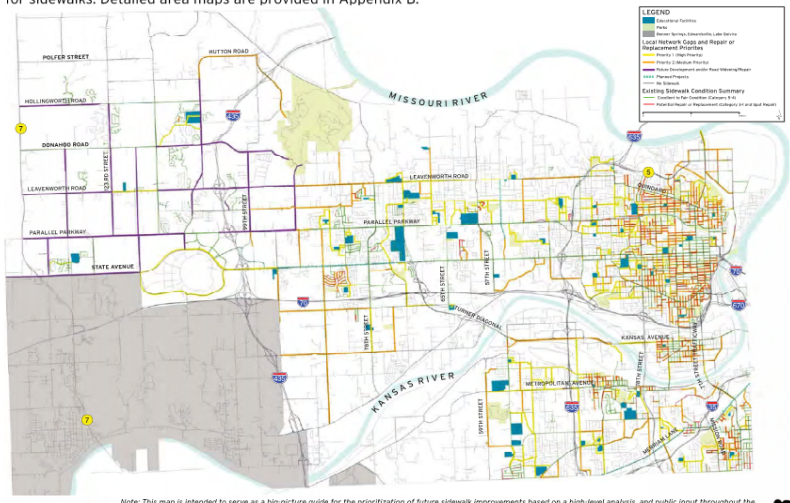
Figure 3.5



Future Sidewalk Network

The Future Sidewalk Network (see below) provides recommended improvements and priorities for sidewalks. Detailed area maps are provided in Appendix B.

Figure 6.1



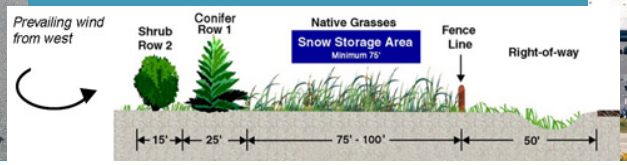
Note: This map is intended to serve as a big-picture guide for the prioritization of future sidewalk improvements based on a high-level analysis, and public input throughout the Plan process. Specific routes and priorities may be modified based on changing conditions, further public input, and a more detailed engineering analysis.

Corridor-Wide

Recommended Solutions

Photo Sources:
TH 14 project corridor, Nicollet, MN
https://www.jupiter.fl.us/index.aspx?NID=586
http://www.iowadot.gov/maintenance/snowfence.html

Short (0-5yrs)	Medium (5-10yrs)	Long (10+yrs)
• Consistent Approach to Speed Limits • Corridor Lighting • Access Management Plan • Active Road Maintenance • Enforcement • Education/ Outreach	• ITS Speed Technologies	• Roundabouts at City Limits



Various Intersections

Recommended Solutions

Short (0-5yrs)	Medium/Long (5+yrs)
• ICE review process • Remove bypass lanes and install left turn lanes • Stop sign improvements	• Install traffic control chosen from ICE review process

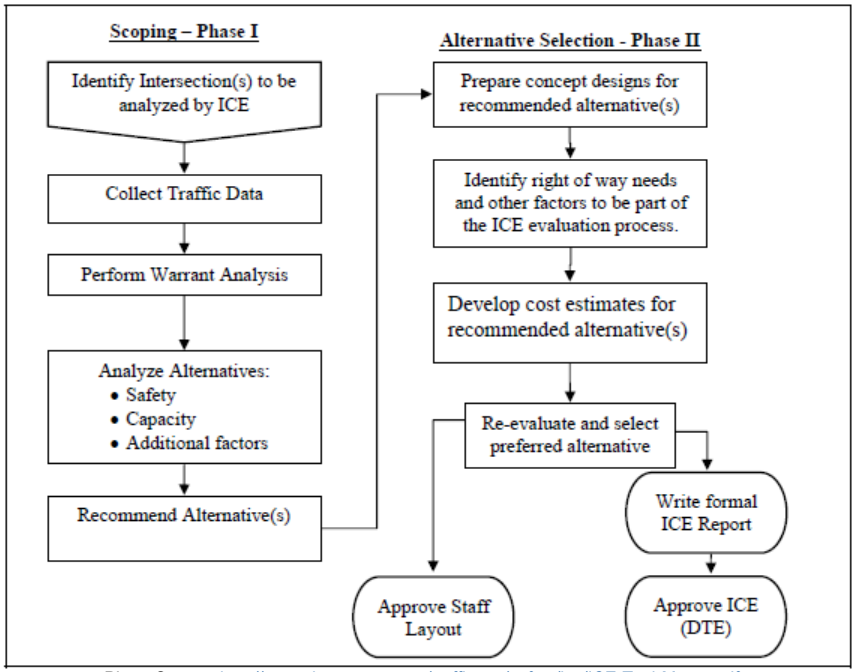
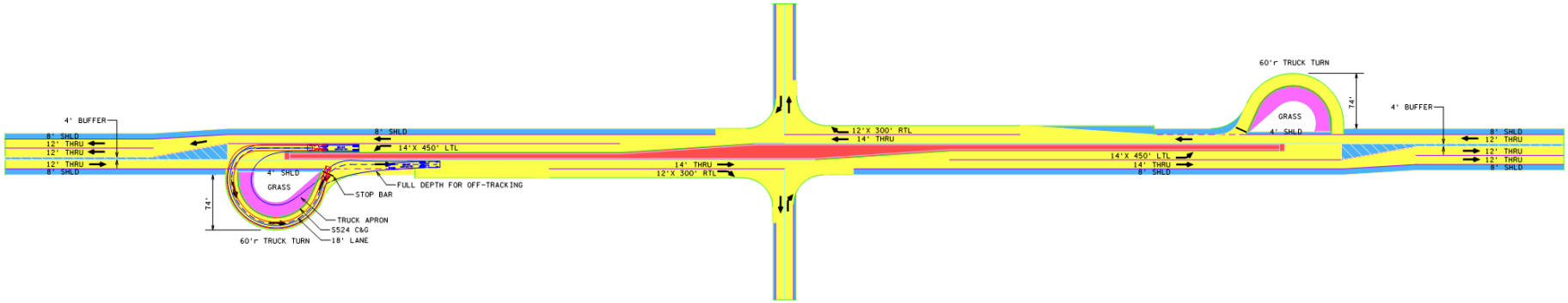
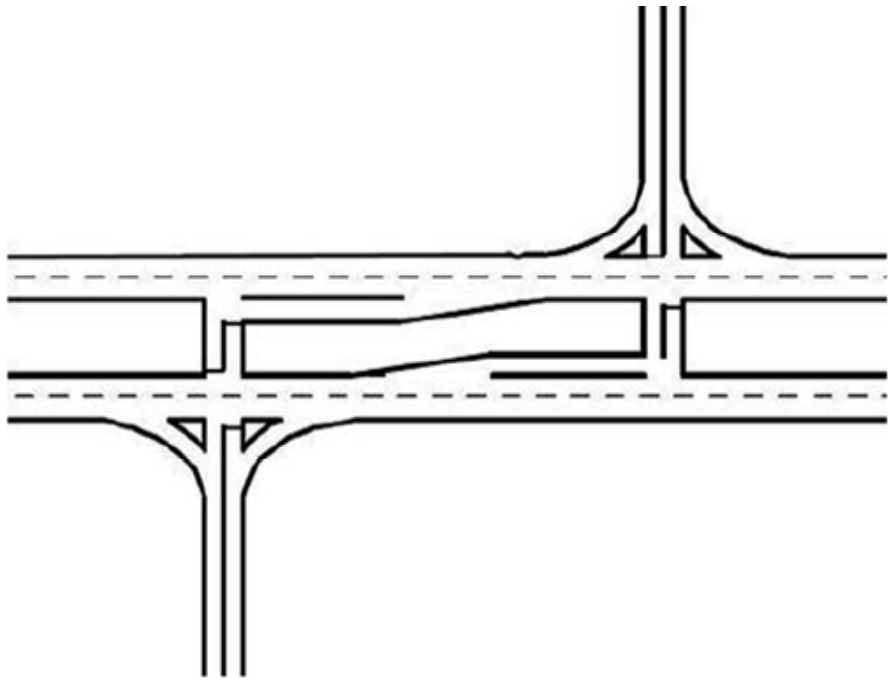


Photo Source: http://www.dot.state.mn.us/trafficeng/safety/ice/ICE-TechMemo.pdf

Hybrid RCUT


4' BUFFER
8' SHLD
12' THRU
12' THRU
12' THRU
8' SHLD
8' SHLD
14'X 450' LTL
4' SHLD
GRASS
74'
60'r TRUCK TURN
STOP BAR
FULL DEPTH FOR OFF-TRACKING
TRUCK APRON
S524 C&G
18' LANE
14' THRU
12'X 300' RTL
12'X 300' RTL
14' THRU
14'X 450' LTL
14' THRU
8' SHLD
60'r TRUCK TURN
74'
GRASS
4' SHLD
4' BUFFER
8' SHLD
12' THRU
12' THRU
12' THRU
8' SHLD

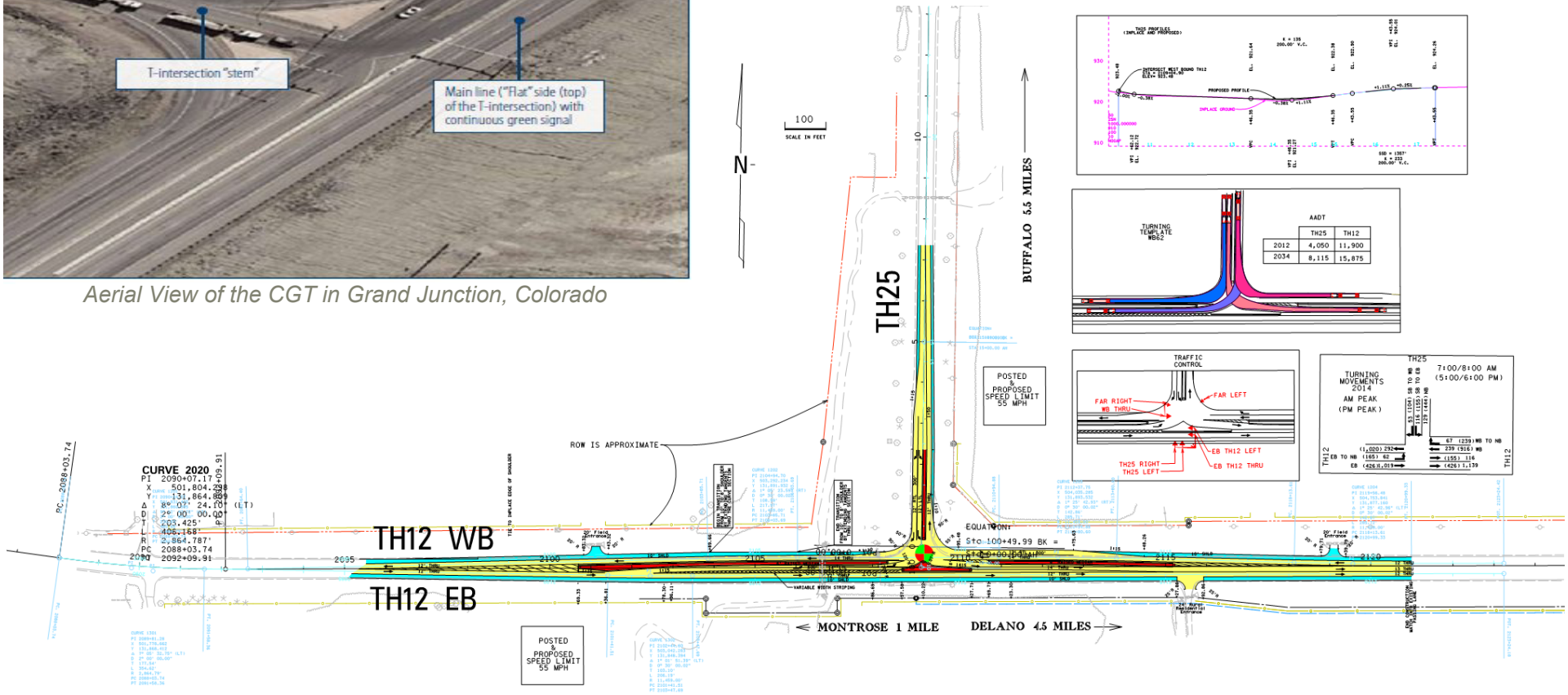
Offset T Intersection



Continuous Green T (CGT)

Aerial View of the CGT in Grand Junction, Colorado

CGT construction at TH 25 (1 mile east of Montrose)

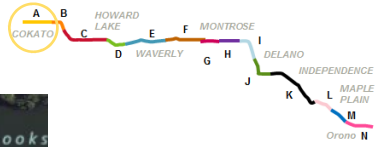


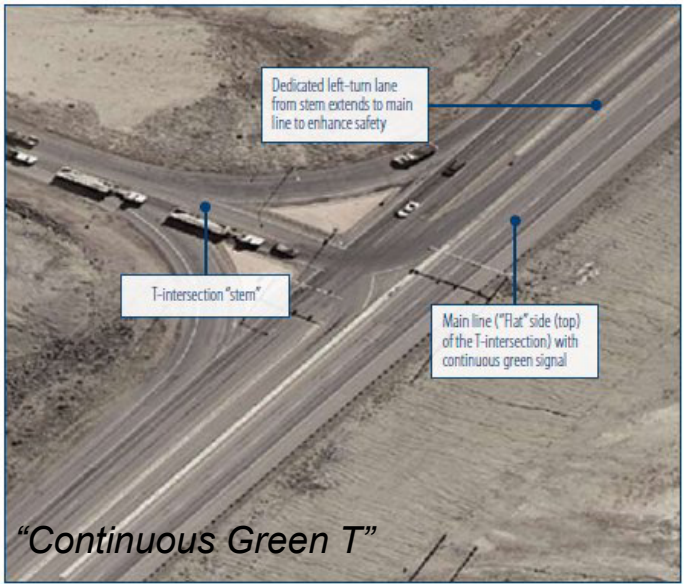
Roundabouts Example

TH 284 in Waconia, MN

https://www.google.com/maps/place/Waconia,+MN/@44.8395532,-93.7843975,3387m/data=!3m1!1e3!4m2!3m1!1s0x87f5fc3665093de3:0x97d7b12f9262a920!6m1!1e1

Segment A [*West of Cokato*]





Short Term:

- Active enforcement near Dassel-Cokato High School
- Evaluate start/end times for schools
- ICE review process at Reardon Avenue intersection
    - Signal with advanced queue detection and warning for mainline traffic
    - Continuous Green T with dedicated left turn lane
    - Roundabout

Segment A [*West of Cokato*]

Segment A Crash Rates

Segment	Roadway Type	Crash Rate			K + A (FAR)		
		US 12	State Average	Critical	US 12	State Average	Critical
A	Rural 2-lane: ADT (5000-8000)	0.61	0.61	0.95	***5.12***	2.41	6.86

Legend:

X.XX	US 12 Exceeds the State Average Rate
X.XX	US 12 Exceeds the Critical Rate and the State Average Rate

Segment A Intersection Crash Rates

Cross Street	Intersection Type	Crash Rate			K + A (FAR)		
		US 12	State Average	Critical	US 12	State Average	Critical
Rhoades Ave SW	Rural Thru/Stop	0.21	0.26	0.64	0.00	1.06	8.11
Reardon Ave SW	Rural Thru/Stop	0.21	0.26	0.64	0.00	1.06	8.11
Quimby Ave SW	Rural Thru/Stop	***0.28***	0.26	0.64	0.00	1.06	8.08

Segment A Intersection Crash Severities

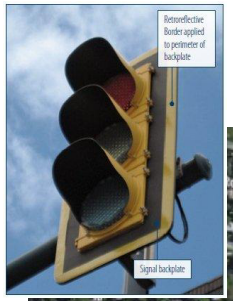
Cross Street	K	A	B	C	N	K+A	Total
Rhoades Ave SW	0	0	0	0	3	0	3
Reardon Ave SW	0	0	1	0	2	0	3
Quimby Ave SW	0	0	1	0	3	0	4

Legend:

A - Incapacitating
B - Non-Incapacitating
C - Possible Injury
K - Fatal
N - Property Damage

X.XX	More than 5 crashes occurred in 2010-2014

Segment B [*Cokato*]



Short Term:

- Striping updates at Broadway Ave (CR 3 - increased width for truck movements)

Medium Term:

- Overhead Pedestrian Indications

Medium to Long Term:

- Access management
- Install pedestrian bump outs at Broadway Ave
- Move north and south stop bars closer to intersection at Broadway Ave

Segment B [*Cokato*]

Segment B Intersection Crash Rates

Cross Street	Intersection Type	Crash Rate			K + A (FAR)		
		US 12	State Average	Critical	US 12	State Average	Critical
Sunset Ave N	Urban Thru/Stop	***0.21***	0.18	0.51	0.00	0.31	5.73
Johnson Ave N	Urban Thru/Stop	***0.28***	0.18	0.47	0.00	0.31	4.78
Jackson Ave NW	Urban Thru/Stop	***0.29***	0.18	0.45	0.00	0.31	4.28
CR 3 / Broadway Ave N	Traffic Signal: Low Volume, Low Speed	0.30	0.55	0.93	0.00	0.54	4.25
Olson Blvd	Urban Thru/Stop	0.06	0.18	0.49	0.00	0.31	5.17
Industrial Park Rd SE	Urban Thru/Stop	0.06	0.18	0.49	0.00	0.31	5.17
CR 4 / 1st St NE	Urban Thru/Stop	0.12	0.18	0.48	0.00	0.31	4.90
53rd St SW / 3rd St E	Urban Thru/Stop	0.06	0.18	0.49	0.00	0.31	5.05

Legend:

X.XX	US 12 Exceeds the State Average Rate
X.XX	US 12 Exceeds the Critical Rate and the State Average Rate

Segment B Intersection Crash Severities

Cross Street	K	A	B	C	N	K+A	Total
Sunset Ave N	0	0	0	2	1	0	3
Johnson Ave N	0	0	0	1	4	0	***5***
Jackson Ave NW	0	0	0	0	6	0	***6***
CR 3 / Broadway Ave N	0	0	0	0	8	0	***8***
Olson Blvd	0	0	0	0	1	0	1
Industrial Park Rd SE	0	0	0	0	1	0	1
CR 4 / 1st St NE	0	0	0	1	1	0	2
53rd St SW / 3rd St E	0	0	0	0	1	0	1

Legend:

A - Incapacitating
B - Non-Incapacitating
C - Possible Injury
K - Fatal
N - Property Damage

X.XX	*More than 5 crashes occurred in 2010-2014*

Segment D [*Howard Lake*]

Short Term:

- Relocate "1005 Sixth Street Burkstrand Building" sign around north leg of 10th Avenue
- Update pedestrian flashers to be Rectangular Rapid Flash Beacons (RRFBs)

Medium to Long Term:

- Install pedestrian bump outs at CR 6/10th Ave

http://www.tapconet.com/solar-led-division/rectangular-rapid-flash-beacons

Segment D [*Howard Lake*]

Segment D Crash Rates

Segment	Roadway Type	Crash Rate			K + A (FAR)		
		US 12	State Average	Critical	US 12	State Average	Critical
D	3-lane Undivided	0.75	2.00	2.67	***3.25***	2.67	3.07

Legend:

X.XX	US 12 Exceeds the State Average Rate
X.XX	US 12 Exceeds the Critical Rate and the State Average Rate

Segment D Intersection Crash Rates

Cross Street	Intersection Type	Crash Rate			K + A (FAR)		
		US 12	State Average	Critical	US 12	State Average	Critical
Keats Ave SW	Urban Thru/Stop	0.14	0.18	0.51	0.00	0.31	5.55
13th Ave	Urban Thru/Stop	0.11	0.18	0.47	0.00	0.31	4.71
CR 6 LT / 10th Ave	Urban Thru/Stop	***0.40***	0.18	0.46	0.00	0.31	4.40
9th Ave	Urban Thru/Stop	0.05	0.18	0.47	0.00	0.31	4.71
8th Ave	Urban Thru/Stop	0.05	0.18	0.47	0.00	0.31	4.71
CR 6 RT / 7th Ave	Urban Thru/Stop	***0.19***	0.18	0.45	0.00	0.31	4.29
6th Ave	Urban Thru/Stop	0.06	0.18	0.47	0.00	0.31	4.75
CR 7 / Shoreline Dr	Urban Thru/Stop	0.05	0.18	0.47	0.00	0.31	4.60

Segment D Intersection Crash Severities

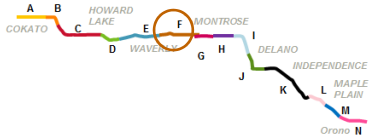
Cross Street	K	A	B	C	N	K+A	Total
Keats Ave SW	0	0	0	0	2	0	2
13th Ave	0	0	0	0	2	0	2
CR 6 LT / 10th Ave	0	0	2	0	6	0	***8***
9th Ave	0	0	0	0	1	0	1
8th Ave	0	0	0	0	1	0	1
CR 6 RT / 7th Ave	0	0	1	2	1	0	4
6th Ave	0	0	0	1	0	0	1
CR 7 / Shoreline Dr	0	0	0	0	1	0	1

Legend:

A - Incapacitating
B - Non-Incapacitating
C - Possible Injury
K - Fatal
N - Property Damage

X.XX	*More than 5 crashes occurred in 2010-2014*

Segment F [*Waverly/Montrose*]

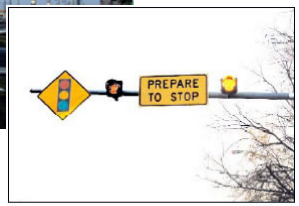


Short Term:

- Add additional street light at Clementa Ave in southwest quadrant
- Install advanced warning signs/flashers to notify eastbound and westbound drivers of signal at Buffalo Avenue/TH 25/CR 12
- Update pedestrian flashers to be RRFB's

Medium to Long Term:

- Install pedestrian bump outs at various crossings
- Install HAWK at or near 4th ST/CR 62



Segment F [*Waverly/Montrose*]

Segment F Intersection Crash Rates

Cross Street	Intersection Type	Crash Rate			K + A (FAR)		
		US 12	State Average	Critical	US 12	State Average	Critical
CR 8 LT/ Emerson Ave SW	Urban Thru/Stop	***0.21***	0.18	0.46	0.00	0.31	4.48
CR 8 RT	Urban Thru/Stop	0.09	0.18	0.44	0.00	0.31	4.05
S 4th St / CR 62	Urban Thru/Stop	***0.20***	0.18	0.46	0.00	0.31	4.45
S 1st St	Urban Thru/Stop	0.06	0.18	0.48	0.00	0.31	4.81
Dempsey Ave SW	Urban Thru/Stop	0.06	0.18	0.47	0.00	0.31	4.78
Clementa Ave SW	Urban Thru/Stop	***0.21***	0.18	0.46	0.00	0.31	4.54
Center Ave S	Urban Thru/Stop	***0.26***	0.18	0.46	0.00	0.31	4.49
T.H. 25 RT / CR 12 / Buffalo Ave S	Traffic Signal: Low Volume, Low Speed	0.37	0.55	0.93	0.00	0.54	4.20
Arizona Ave	Urban Thru/Stop	0.09	0.18	0.45	0.00	0.31	4.15

Legend:

X.XX	US 12 Exceeds the State Average Rate
X.XX	US 12 Exceeds the Critical Rate and the State Average Rate

Segment F Intersection Crash Severities

Cross Street	K	A	B	C	N	K+A	Total
CR 8 LT/ Emerson Ave SW	0	0	1	2	1	0	4
CR 8 RT	0	0	1	1	0	0	2
S 4th St / CR 62	0	0	0	3	1	0	4
S 1st St	0	0	1	0	0	0	1
Dempsey Ave SW	0	0	0	0	1	0	1
Clementa Ave SW	0	0	0	3	1	0	4
Center Ave S	0	0	1	3	1	0	***5***
T.H. 25 RT / CR 12 / Buffalo Ave S	0	0	0	7	3	0	***10***
Arizona Ave	0	0	0	0	2	0	2

Legend:

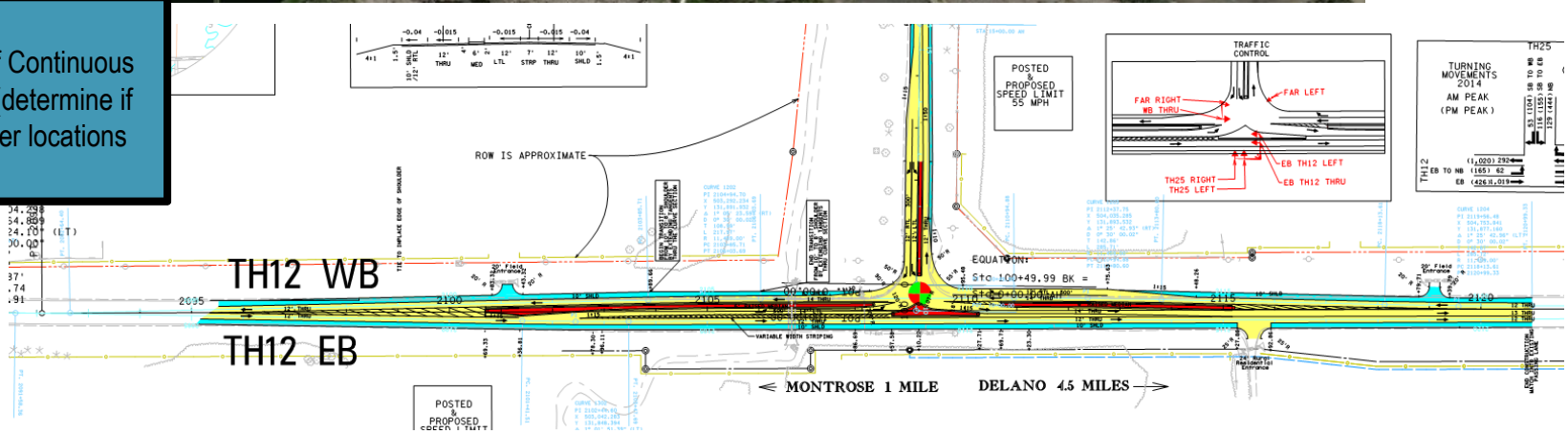
A - Incapacitating
B - Non-Incapacitating
C - Possible Injury
K - Fatal
N - Property Damage

X.XX	*More than 5 crashes occurred in 2010-2014*

Segment G [*Eastern Montrose*]

Short Term:

- Monitor success of Continuous Green T at TH 25 (determine if can be used at other locations along the corridor)



Segment G [*Eastern Montrose*]

Segment G Crash Rates

		Crash Rate			K + A (FAR)		
Segment	Roadway Type	US 12	State Average	Critical	US 12	State Average	Critical
G	Rural 2-lane: ADT >8000	0.61	0.73	1.10	***5.07***	1.57	1.84

Legend:

X.XX	US 12 Exceeds the State Average Rate
X.XX	US 12 Exceeds the Critical Rate and the State Average Rate

Segment G Intersection Crash Rates

		Crash Rate			K + A (FAR)		
Cross Street	Intersection Type	US 12	State Average	Critical	US 12	State Average	Critical
Zephyr Ave	Rural Thru/Stop	0.09	0.26	0.56	***4.62***	1.06	6.22
Meridan Ave S	Rural Thru/Stop	0.14	0.26	0.56	0.00	1.06	6.22
Aetna Ave SE	Rural Thru/Stop	0.09	0.26	0.56	0.00	1.06	6.22
T.H. 25 LT	Rural Thru/Stop	***0.27***	0.26	0.53	0.00	1.06	5.58

Segment G Intersection Crash Severities

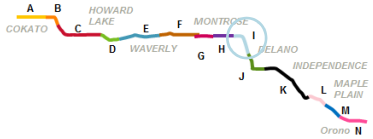
Cross Street	K	A	B	C	N	K+A	Total
Zephyr Ave	1	0	0	0	1	1	2
Meridan Ave S	0	0	0	0	3	0	3
Aetna Ave SE	0	0	1	0	1	0	2
T.H. 25 LT	0	0	0	0	7	0	***7***

Legend:

A - Incapacitating
B - Non-Incapacitating
C - Possible Injury
K – Fatal
N - Property Damage

X.XX	*More than 5 crashes occurred in 2010-2014*

Segment I [*West of Delano*]



Short Term:

- Add more lighting between CR 14 and Delano
- Add "Cross Traffic Does Not Stop" signage at CR 14 north approach and add LED flashers to stop sign perimeter

Figure 1: Example of stop sign with embedded LEDs and solar unit.

Photo Sources:
http://safety.fhwa.dot.gov/intersection/resources/techsum/fhwasa09006/
http://www.southernminn.com/waseca_county_news/news/article_33a7138c-77bc-5304-a48d-f9cfcbd59c1c.html

Segment I [*West of Delano*]

Segment I Crash Rates

Segment	Roadway Type	Crash Rate			K + A (FAR)		
		US 12	State Average	Critical	US 12	State Average	Critical
I	Rural 2-lane: ADT >8000	0.32	0.73	1.06	***2.13***	1.57	1.81

Legend:

X.XX	US 12 Exceeds the State Average Rate
X.XX	US 12 Exceeds the Critical Rate and the State Average Rate

Segment I Intersection Crash Rates

Cross Street	Intersection Type	Crash Rate			K + A (FAR)		
		US 12	State Average	Critical	US 12	State Average	Critical
CR 14	Rural Thru/Stop	***0.29***	0.26	0.54	0.00	1.06	5.78
57th St SE	Rural Thru/Stop	0.05	0.26	0.56	0.00	1.06	6.24
Eaken Ave SE	Rural Thru/Stop	0.05	0.26	0.56	0.00	1.06	6.24

Segment I Intersection Crash Severities

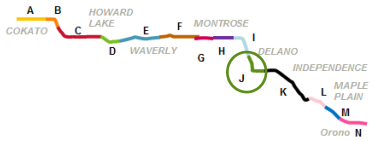
Cross Street	K	A	B	C	N	K+A	Total
CR 14	0	0	1	2	4	0	***7***
57th St SE	0	0	0	0	1	0	1
Eaken Ave SE	0	0	0	0	1	0	1

Legend:

A - Incapacitating
B - Non-Incapacitating
C - Possible Injury
K - Fatal
N - Property Damage

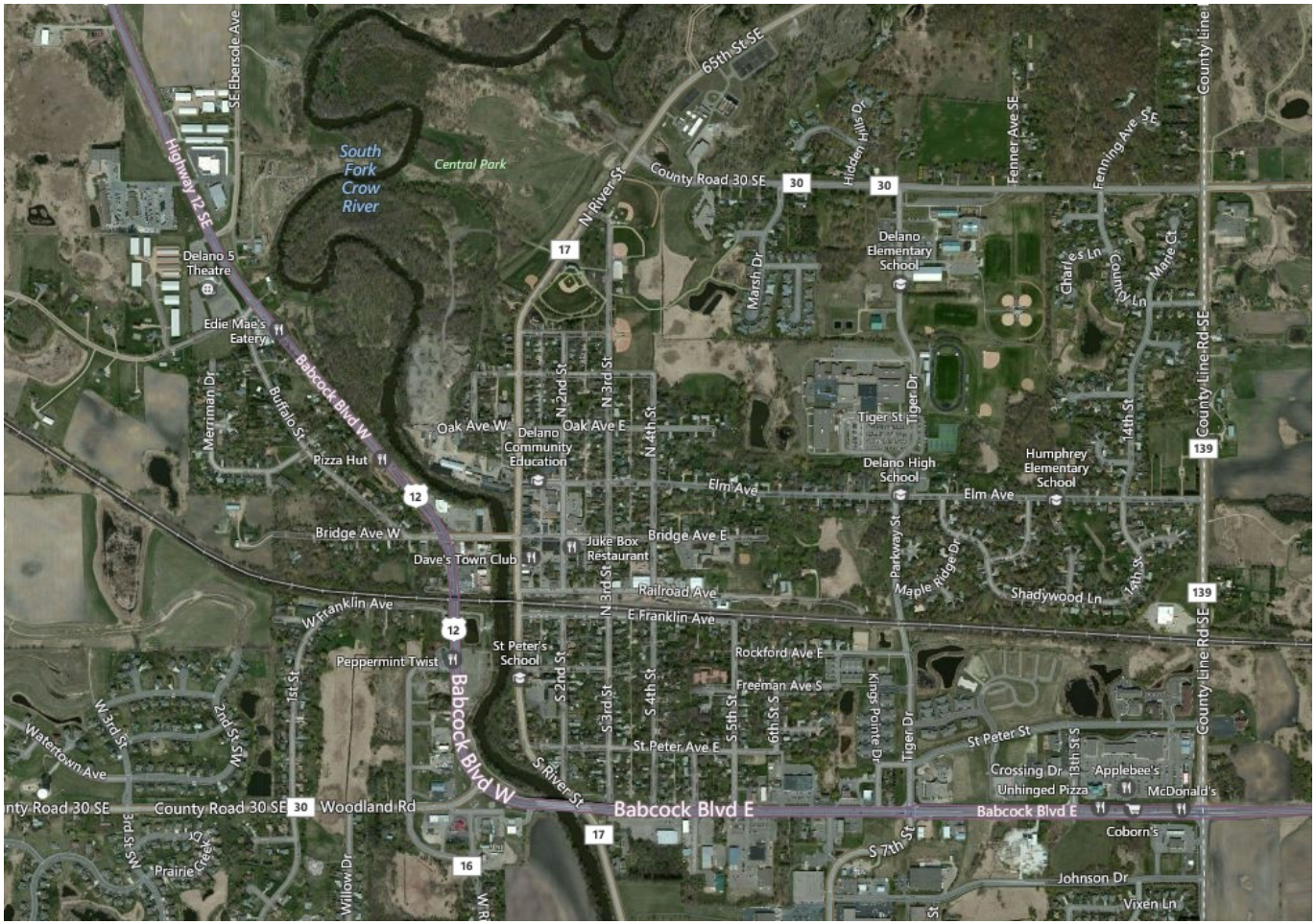
X.XX	*More than 5 crashes occurred in 2010-2014*

Segment J [*Delano*]

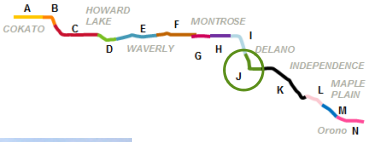


Short Term:

- Add warning flashers and relocate beacon prior to the bridge east of the Bridge Avenue Intersection and prior to the curve west of the intersection
- Add “Signal Ahead” signs for westbound traffic at CR 30
- Add horizontal curvature warning sign for westbound traffic approaching the CR 30 intersection
- Change 4-way stop to be 2-way stop at the intersection north of the US12/Tiger Drive intersection
- Perform an intersection capacity analysis to determine if additional lanes needed at Tiger Drive
- Evaluate system-wide signal coordination through town
- Add flashing yellow arrow for left turns at County Line Road/CR 139
- Add pavement markings for pedestrian crossings at County Line Road/CR 139



Segment J [*Delano*]



Medium-Term:

- Add pedestrian bump outs/curb extensions on US 12 intersections
- Look into closing accesses around Babcock Circle, especially on the north side of US 12.
- Remove left turn lanes onto Crow River Drive
- Extend right turn lanes at County Line Road/CR 139

Long-Term:

- Make segment 4-lanes with center median

Curb extensions
(Credit: Michele Weisbart)

Photo Sources:
http://pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=5
http://www.startribune.com/the-drive-why-we-don-t-have-more-flashing-yellow-arrows/293510151/
http://www.drasla.com/portfolio/parks-public-municipal/

Segment J [*Delano*]

Segment J Intersection Crash Rates

Cross Street	Intersection Type	Crash Rate			K + A (FAR)		
		US 12	State Average	Critical	US 12	State Average	Critical
Ebersole Ave SE	Urban Thru/Stop	0.05	0.18	0.45	0.00	0.31	4.17
72nd St SE	Urban Thru/Stop	0.03	0.18	0.40	0.00	0.31	3.21
Bridge Ave E	Traffic Signal: High Volume, Low Speed	0.62	0.69	1.09	0.00	0.71	4.28
Franklin Ave W	Urban Thru/Stop	0.04	0.18	0.41	0.00	0.31	3.47
CR 30 RT	Traffic Signal: High Volume, Low Speed	0.22	0.69	1.11	0.00	0.71	4.57
Kelsey St	Urban Thru/Stop	0.06	0.18	0.40	0.00	0.31	3.13
5th St S	Urban Thru/Stop	0.15	0.18	0.39	0.00	0.31	3.09
Babcock Cir	Urban Thru/Stop	0.15	0.18	0.39	0.00	0.31	3.09
Tiger Dr	Traffic Signal: High Volume, Low Speed	0.16	0.69	1.08	0.00	0.71	4.17
13th St	Urban Thru/Stop	0.13	0.18	0.40	0.00	0.31	3.13
CR 139 / County Line Rd SE	Traffic Signal: High Volume, Low Speed	***0.84***	0.69	1.07	0.00	0.71	4.00

Legend:

X.XX	US 12 Exceeds the State Average Rate
X.XX	US 12 Exceeds the Critical Rate and the State Average Rate

Segment J Intersection Crash Severities

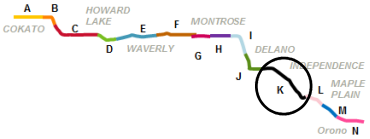
Cross Street	K	A	B	C	N	K+A	Total
Ebersole Ave SE	0	0	0	1	0	0	1
72nd St SE	0	0	0	1	0	0	1
Bridge Ave E	0	0	1	1	17	0	***19***
Franklin Ave W	0	0	0	1	0	0	1
CR 30 RT	0	0	1	1	4	0	***6***
Kelsey St	0	0	0	2	0	0	2
5th St S	0	0	1	1	3	0	***5***
Babcock Cir	0	0	0	1	4	0	***5***
Tiger Dr	0	0	0	0	5	0	***5***
13th St	0	0	0	0	4	0	4
CR 139 / County Line Rd SE	0	0	1	6	22	0	***29***

Legend:

A - Incapacitating
B - Non-Incapacitating
C - Possible Injury
K – Fatal
N - Property Damage

X.XX	*More than 5 crashes occurred in 2010-2014*

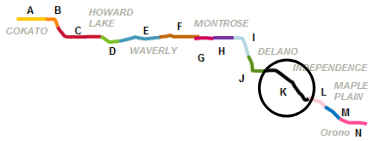
Segment K [*Independence*]



Short-Term:

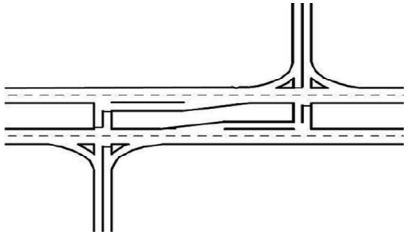
- Add chevrons to horizontal curve around mile marker 144
- Add corridor lighting between CR 92 and CR 90
- Add left turn lanes on CR 92
- ICE review process at CR 92 and CR 90 intersections
    - Roundabout or other reduced conflict intersection at CR 92 south approach
    - Right in-right-out configuration for CR 92 north approach
    - Conjoin both 92 intersections using a roundabout
    - Roundabout at CR 90

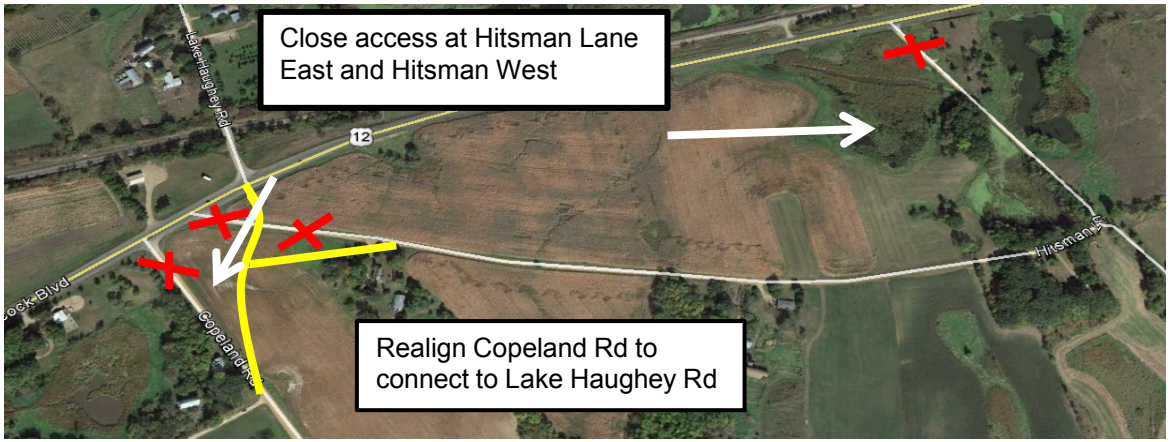
Segment K [*Independence*]

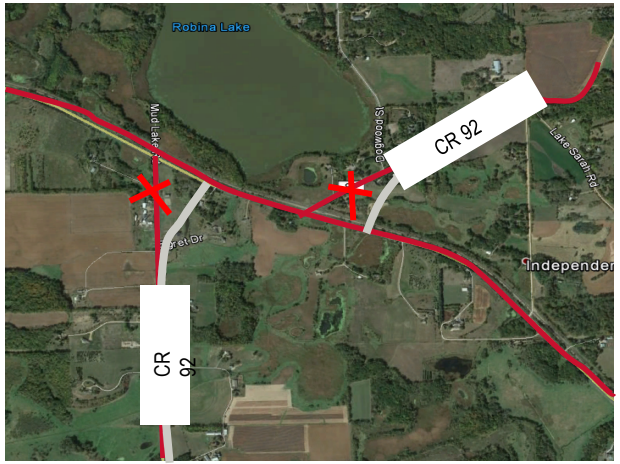


Medium-Term:

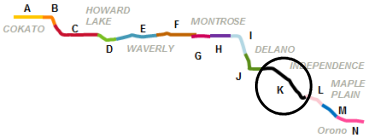
- Add pavement to widen shoulders and Install center buffer strip
- Close western access for Peterson Produce, access to Hitsman Lane East, and access to Valley Road
- Add a left turn lane for Peterson Produce
- Improve clear zone on westbound shoulder between CR 92 and CR 90
- Realign approaches from CR 92 intersections to remove skew and create a positive offset
- Add channelized right turn lane on southern CR 92 approach
- Update lane markings on CR 90 such that mainline right turn lanes become thru lanes and thru lanes become left turn lanes





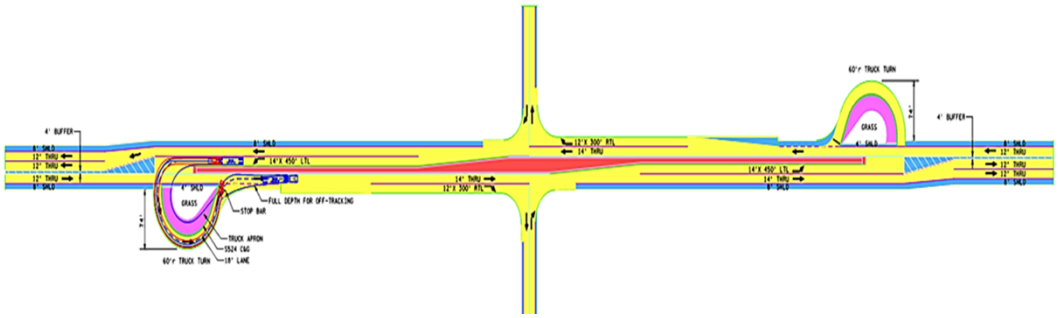


Segment K [*Independence*]



Medium to Long-Term:

- Develop 2+1 passing lane sections
- Install traffic control chosen from ICE process at CR 92 intersections
- Install traffic control chosen from ICE process at CR 90 to alleviate turn movements



Segment K [*Independence*]

Segment K Crash Rates

Segment	Roadway Type	Crash Rate			K + A (FAR)		
		US 12	State Average	Critical	US 12	State Average	Critical
K	Rural 2-lane: ADT >8000	***0.83***	0.73	0.93	***3.00***	1.57	1.71

Segment K Intersection Crash Rates

Cross Street	Intersection Type	Crash Rate			K + A (FAR)		
		US 12	State Average	Critical	US 12	State Average	Critical
Nelson Rd	Rural Thru/Stop	0.19	0.26	0.53	0.00	1.06	5.48
Hitsman Ln West	Rural Thru/Stop	0.11	0.26	0.53	0.00	1.06	5.48
Lake Haughey Rd	Rural Thru/Stop	0.04	0.26	0.53	0.00	1.06	5.48
CR 92 RT / Mud Lake Rd	Rural Thru/Stop	***0.52***	0.26	0.53	0.00	1.06	5.45
CR 92 LT / Lake Sarah Rd	Rural Thru/Stop	0.21	0.26	0.52	0.00	1.06	5.29
Valley Rd	Rural Thru/Stop	0.22	0.26	0.53	0.00	1.06	5.41
CR 90	Rural Thru/Stop	***0.65***	0.26	0.52	0.00	1.06	5.21

Legend:

X.XX	US 12 Exceeds the State Average Rate
X.XX	US 12 Exceeds the Critical Rate and the State Average Rate

Segment K Intersection Crash Severities

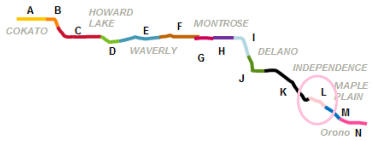
Cross Street	K	A	B	C	N	K+A	Total
Nelson Rd	0	0	1	1	3	0	***5***
Hitsman Ln West	0	0	1	1	1	0	3
Lake Haughey Rd	0	0	0	1	0	0	1
CR 92 RT / Mud Lake Rd	0	0	4	3	7	0	***14***
CR 92 LT / Lake Sarah Rd	0	0	4	0	2	0	***6***
Valley Rd	0	0	0	2	4	0	***6***
CR 90	0	0	1	2	16	0	***19***

Legend:

A - Incapacitating
B - Non-Incapacitating
C - Possible Injury
K - Fatal
N - Property Damage

X.XX	*More than 5 crashes occurred in 2010-2014*

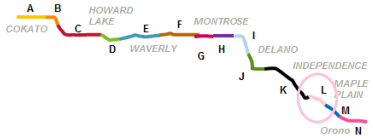
Segment L [*Maple Plain*]

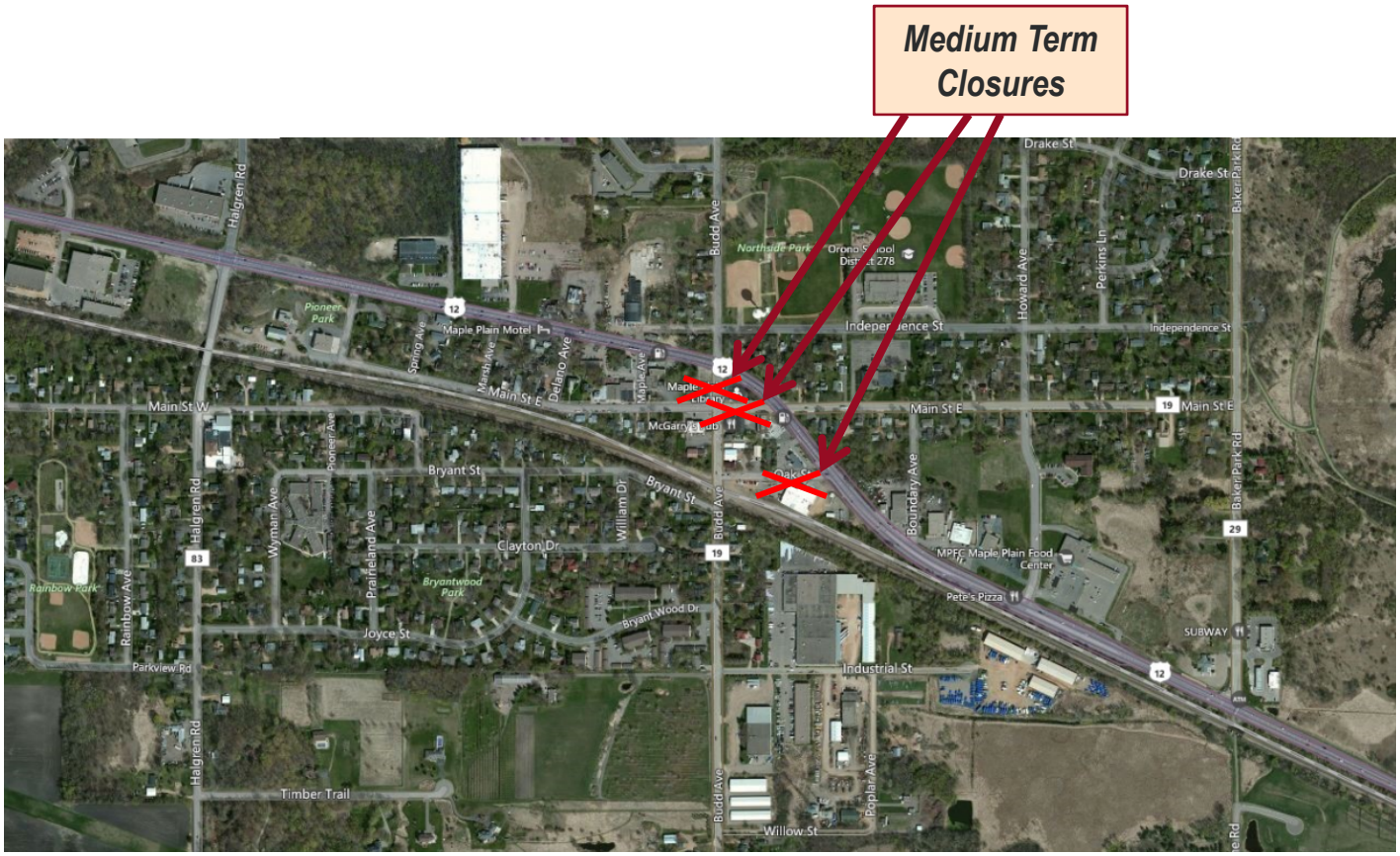


Short-Term:

- Create a continuous left turn lane from CR 83 to the location east of the nearby median barrier
- Add wayfinding signs to direct pedestrians to HAWK signal in town
- Install advanced warning signs to westbound and eastbound traffic approaching the Baker Park Road/CR 29 signal
- ICE review process at Baker Park Road/CR 29
    - Signalized Continuous Green T
    - Reduced Conflict Intersection

Segment L [*Maple Plain*]

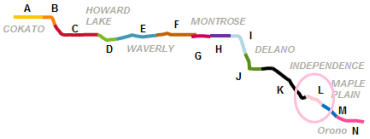


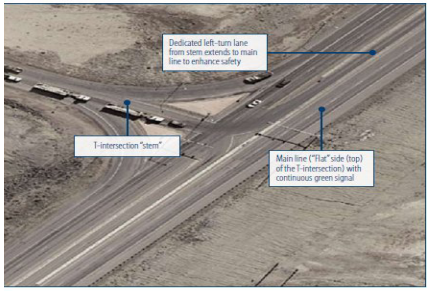


Medium-Term:

- Move left turn loop detectors and re-stripe south approach lanes at CR 83
- Close south access from Budd Avenue and/or CR 19, and close Oak Street access

Segment L [*Maple Plain*]





Medium-Term:

- Move left turn loop detectors and re-stripe south approach lanes at CR 83
- Close south access from Budd Avenue and/or CR 19, and close Oak Street access

Long-Term:

- Install raised median between Maple Avenue and CR 29
- Install roundabouts at Maple Avenue and CR 29
- Install traffic control chosen from ICE process at Baker Park Road/CR 29 intersection

Segment L [*Maple Plain*]

Segment L Intersection Crash Rates

Cross Street	Intersection Type	Crash Rate			K + A (FAR)		
		US 12	State Average	Critical	US 12	State Average	Critical
CR 83 / Halgren Rd	Traffic Signal: High Volume, Low Speed	0.28	0.69	1.08	0.00	0.71	4.21
Pioneer Ave	Urban Thru/Stop	***0.26***	0.18	0.40	***3.27***	0.31	3.23
Delano Ave	Urban Thru/Stop	0.03	0.18	0.40	0.00	0.31	3.23
Maple Ave	Urban Thru/Stop	0.06	0.18	0.40	0.00	0.31	3.19
Budd Ave N	Urban Thru/Stop	***0.48***	0.18	0.40	0.00	0.31	3.19
CR 19 / Main St E	Urban Thru/Stop	***0.26***	0.18	0.39	0.00	0.31	2.99
Howard Ave	Urban Thru/Stop	0.03	0.18	0.40	0.00	0.31	3.23
CR 29 / Baker Park Rd / Townline Rd	Traffic Signal: High Volume, High Speed	0.40	0.41	0.71	0.00	0.51	3.50

Legend:

X.XX	US 12 Exceeds the State Average Rate
X.XX	US 12 Exceeds the Critical Rate and the State Average Rate

Segment L Intersection Crash Severities

Cross Street	K	A	B	C	N	K+A	Total
CR 83 / Halgren Rd	0	0	1	5	3	0	***9***
Pioneer Ave	1	0	1	0	6	1	***8***
Delano Ave	0	0	0	0	1	0	1
Maple Ave	0	0	1	0	1	0	2
Budd Ave N	0	0	3	1	11	0	***15***
CR 19 / Main St E	0	0	0	2	7	0	***9***
Howard Ave	0	0	0	1	0	0	1
CR 29 / Baker Park Rd / Townline Rd	0	0	0	1	13	0	***14***

Legend:

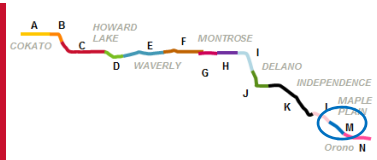
A - Incapacitating
B - Non-Incapacitating
C - Possible Injury
K - Fatal
N - Property Damage

X.XX	*More than 5 crashes occurred in 2010-2014*

Segment M [*Medina*]

Short-Term:
- Buffer lane
- Add CR 6 ramp metering
- ITS solutions

Medium-Term:
- Dynamic shoulder for eastbound traffic between CR 6 and Wayzata
- Moveable Barrier



Segment M [*Medina*]

Segment M Crash Rates

		Crash Rate			K + A (FAR)		
Segment	Roadway Type	US 12	State Average	Critical	US 12	State Average	Critical
M	Rural 2-lane: ADT >8000	0.51	0.73	1.04	***3.66***	1.57	1.80

Legend:

X.XX	US 12 Exceeds the State Average Rate
X.XX	US 12 Exceeds the Critical Rate and the State Average Rate

Segment M Intersection Crash Rates

		Crash Rate			K + A (FAR)		
Cross Street	Intersection Type	US 12	State Average	Critical	US 12	State Average	Critical
CR 6	Other	0.14	0.16	0.34	0.00	0.22	2.64

Segment M Intersection Crash Severities

Cross Street	K	A	B	C	N	K+A	Total
CR 6	0	0	0	1	4	0	***5***

Legend:

A - Incapacitating
B - Non-Incapacitating
C - Possible Injury
K - Fatal
N - Property Damage

X.XX	*More than 5 crashes occurred in 2010-2014*

Next Steps

- Collect comments
- Finalize report
- Districts begin evaluating how short term projects can fit within program
- Locals/coalition to stay involved and continue momentum for pushing safety improvements forward

Source: http://www.european-funding-guide.eu/articles/how-apply/group-discussion

We all have a stake in A 10 B

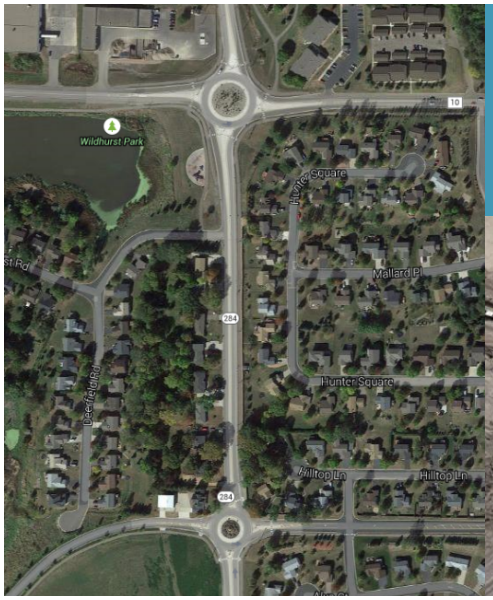
Upcoming Projects

Year Built	Location	Description
District 3 - Programmed		
2015	1 mile east of Montrose	Reconstruction of the TH 25 north leg and US 12 intersection into a Continuous Green T.
FY 2018 (8601-64)	Cokato to Howard Lake	Resurfacing
FY 2019 (8601-61)	Meeker County Line to 7th St E in Cokato	Resurfacing and ADA
District 3 - Planned		
FY 2021	Howard Lake to Delano	Resurfacing - includes ADA in Howard Lake, Waverly and Montrose.

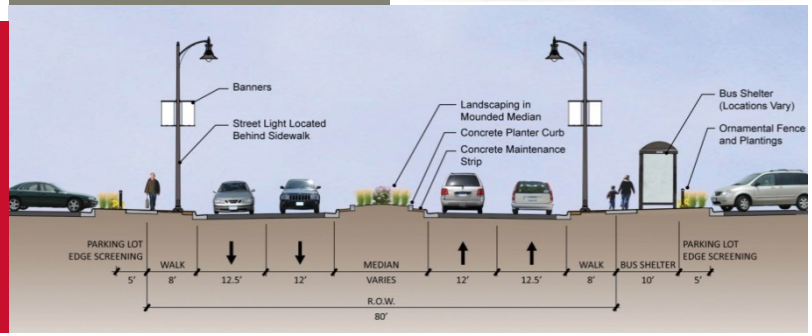
Year Built	Location	Description
Metro District - Programmed		
2015 (2714-124)	CSAH 15/South CSAH 101 to I-494	Add auxiliary lane on EB US 12
Fall 2015 (2713-116)	East of CSAH 90 to County line. Includes 3 County Road intersections and 4 or 5 city roads.	Install intersection lighting.
Metro District - Planned		
FY 2018	CSAH 101 in Wayzata	Re-deck CSAH 101 bridge over US 12
FY 2018	CSAH 90 in Independence	Improvement (left turn lane) was planned at CSAH 90; however, this project was placed on hold pending re-scoping after the RSA is completed.
TBD	CSAH 6 to CSAH 29 and CSAH 90 to County line	Next pavement project - is undetermined at this time.
TBD	EB lanes between the Super 2 and I-494	Interest in adding an extra auxiliary lane

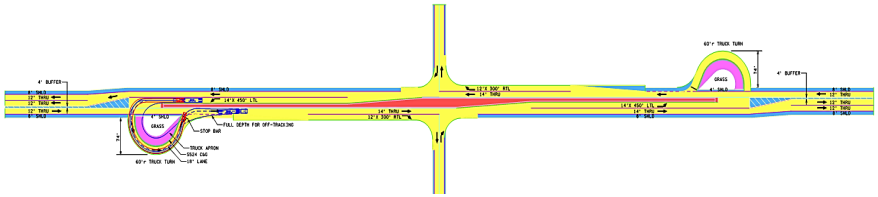
Questions?

FREEWAY TIME TO:
HWY 62 4 MIN
94 13 MIN


Wildhurst Park
Ivy Ne Square
Mallard Pl
Hunter Square
Hilltop Ln
Hilltop Ln
284
284
19

Dedicated left-turn lane from stem extends to main line to enhance safety
T-intersection "stem"
Main line ("Flat" side (top) of the T-intersection) with continuous green signal


Banners
Street Light Located Behind Sidewalk
Landscaping in Mounded Median
Concrete Planter Curb
Concrete Maintenance Strip
Bus Shelter (Locations Vary)
Ornamental Fence and Plantings
PARKING LOT EDGE SCREENING
WALK
MEDIAN VARIES
WALK
BUS SHELTER
PARKING LOT EDGE SCREENING
5'
8'
12.5'
12'
12'
12.5'
8'
10'
5'
R.O.W.
80'



Thank You!

- Derek Leuer, Traffic Safety Engineer

  Minnesota Department of Transportation
  Office of Traffic, Safety and Technology
  Phone: 651-234-7372
  Email: derek.leuer@state.mn.us

- Brandi Popenhagen, Consultant PM

  HDR
  Phone: 763-591-5384
  Email: brandi.popenhagen@hdrinc.com