CITY OF JANESVILLE

Wisconsin's Park Place:

Discover the community of choice to realize life's opportunities

W. Court St. Traffic & Safety Studies

CEF Presentation
November 18, 2020

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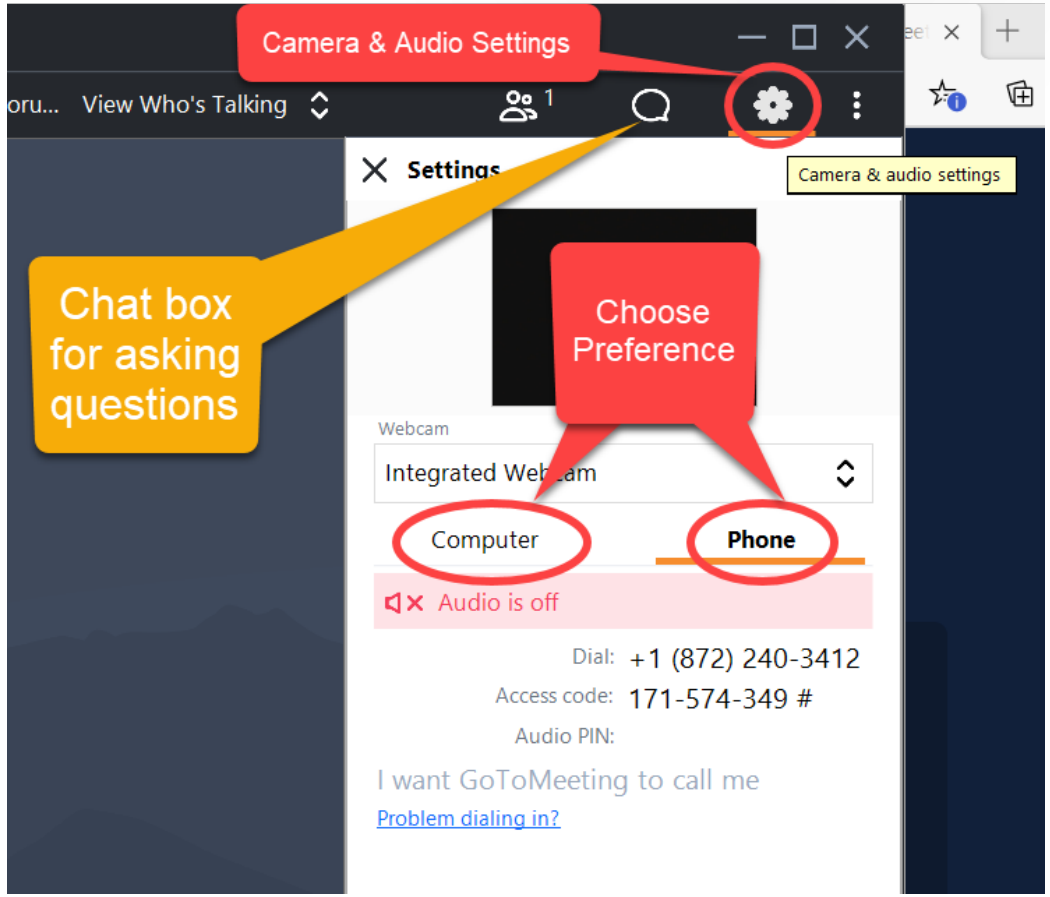
  - Inge Adams (TADI)
  - iadams@tadi-us.com
  - 262-247-5421

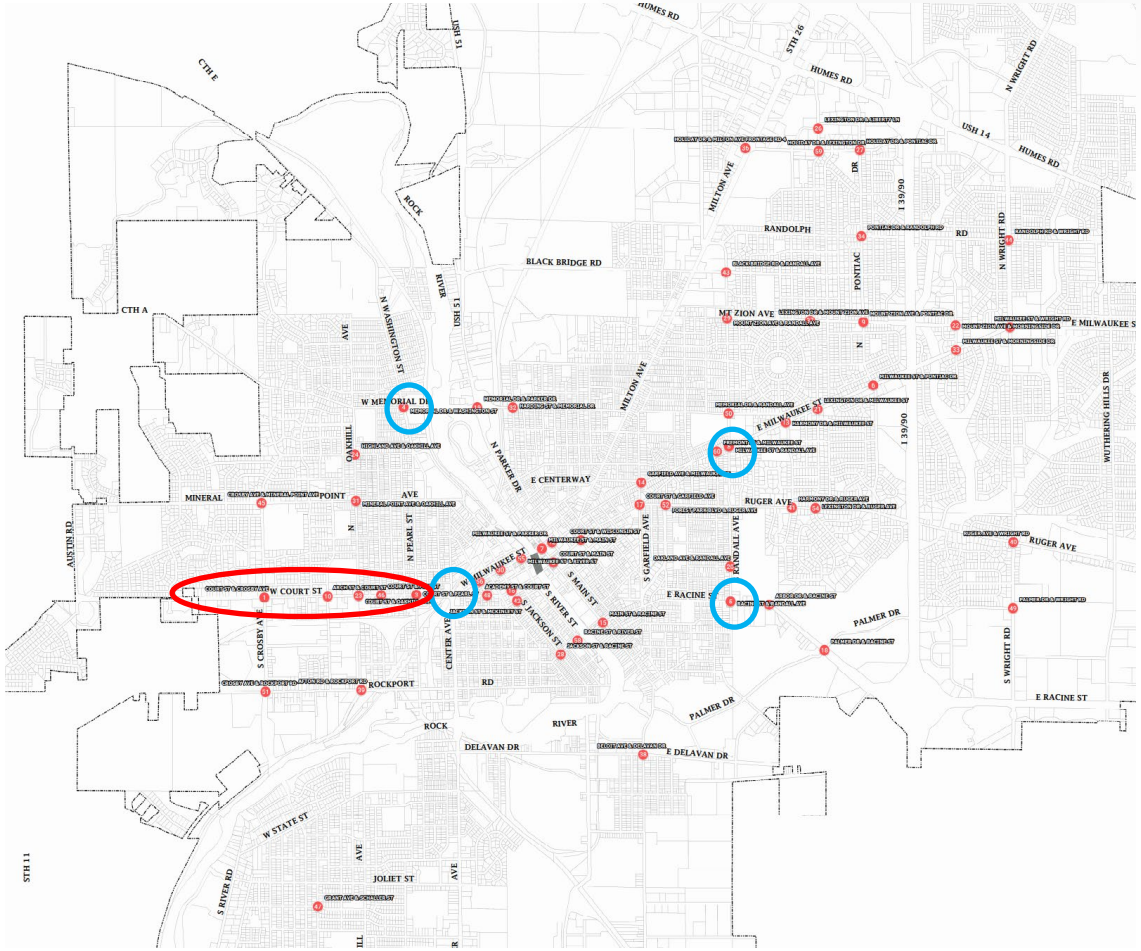


Agenda

- Background
- 2018 Safety and Traffic Study
- Benefits of Safety Conversions
- Traffic Modeling & Federal Aid Safety Applications
- Project Schedule
- Community Engagement
- Contact Information

2018 Safety Screening Analysis

- Identified Top 60 local intersections with highest crash frequency and severity
- Evaluating crash trends and safety improvements
- Applying for Federal Aid to implement safety improvements



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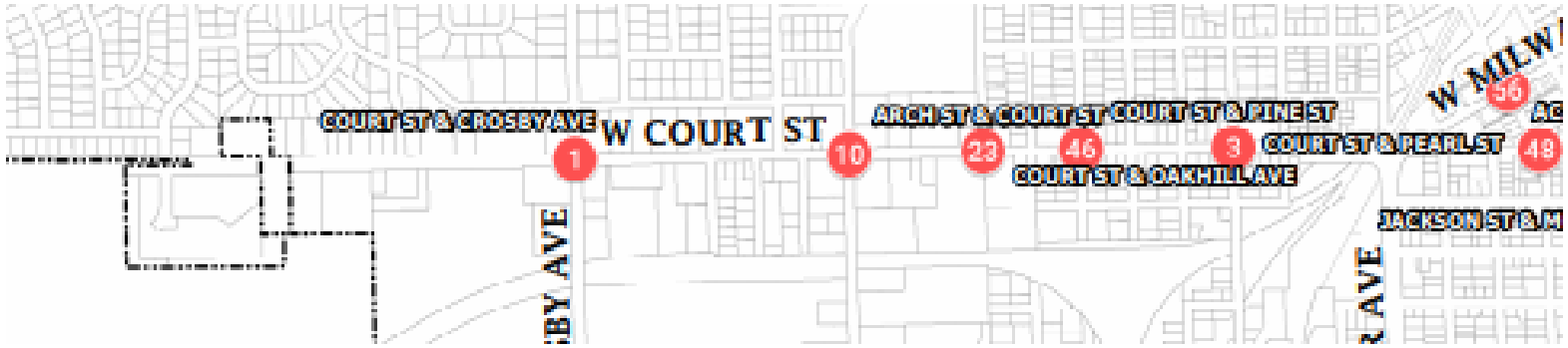
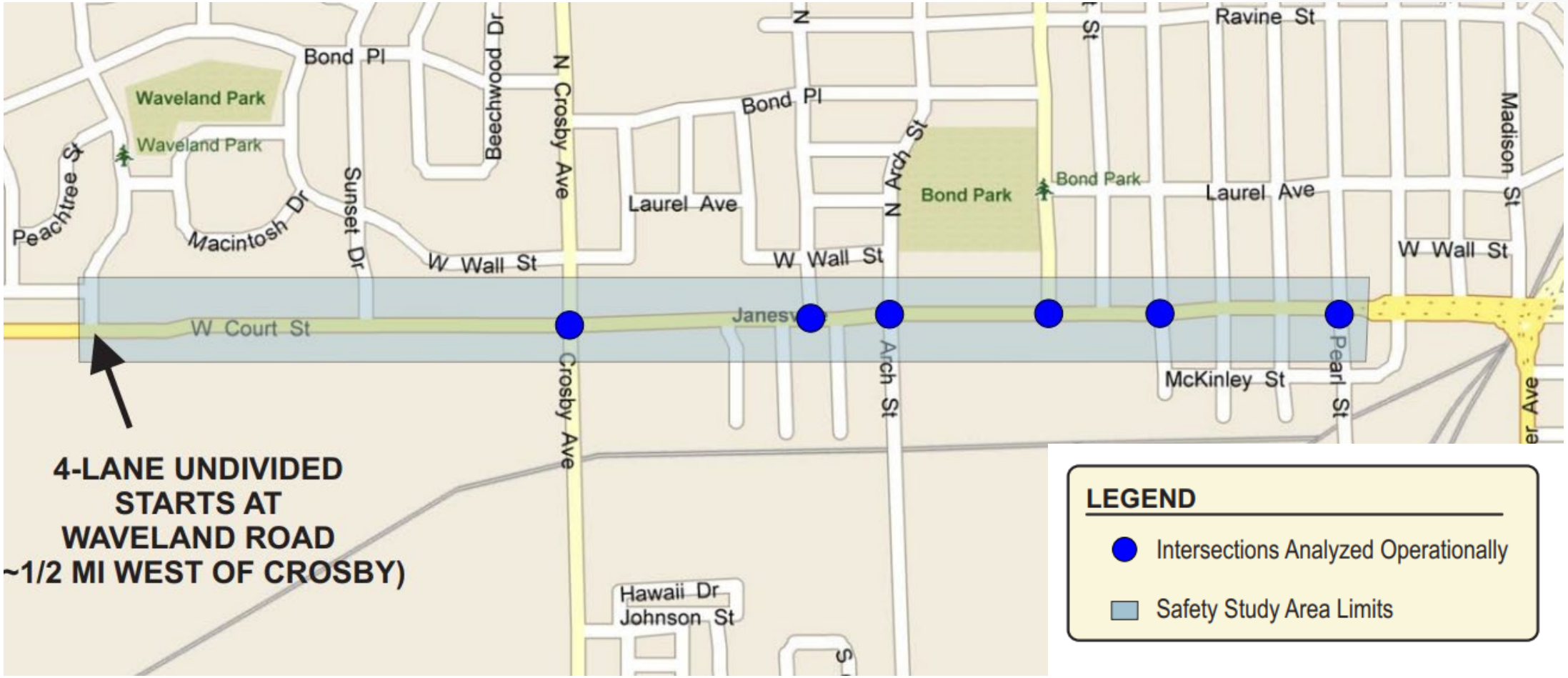
W. Court St. corridor

- 5 out of 14 intersections are in the Top 60
  - All 3 signalized intersections (Crosby, Arch, Pearl)
  - 2 unsignalized intersections (Oakhill, Pine)
- Review W. Court St. for corridor-wide safety improvements



Project Limits



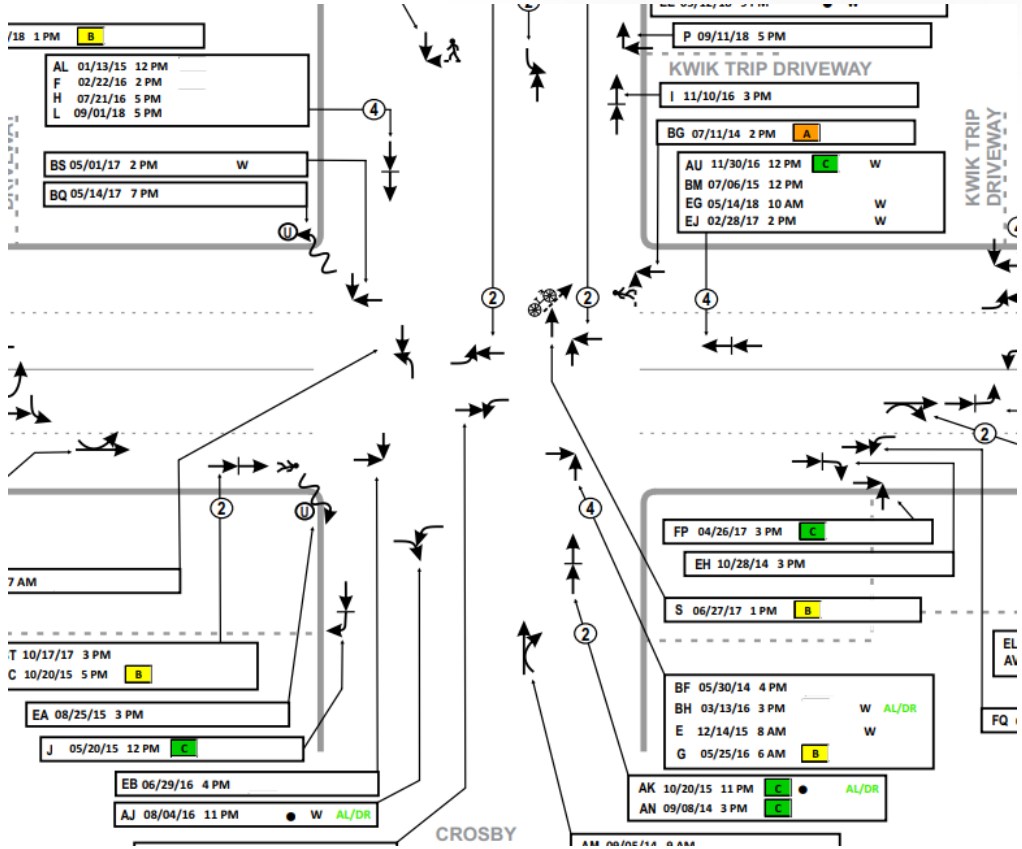
2018 Traffic and Safety Study

- Safety Study
  - Document crashes over 5-year period (2014-2018)
  - Identify crash patterns
  - Determine safety improvement solutions

- Traffic Study
  - Collect traffic data
  - Forecast traffic for 20-yr design life (2043)
  - Evaluate operations with existing conditions
  - Evaluate operations with modifications to:
    - Cross Section (number of lanes)
    - Intersection Geometry
    - Traffic Signal Phasing

Safety Study Results (2014-2018)

- 164 crashes in 5-yr period
- 2 fatalities, 1 incapacitating injury, 20 injury crashes
- 16 Bicycle and Pedestrian-related crashes
- Corridor crash rate **more than double** the statewide crash rate



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2018 Traffic and Safety Study Recommendations

- Consider 3-lane TWLTL Cross Section on W. Court St.:
  - Acceptable Operations compared with 4-lane
  - Research-proven Safety Benefits
- Consider improvements at Crosby Ave intersection:
  - Provide dedicated LT, TH, and RT lanes in EB & WB directions
  - Reconfigure NB & SB LT lanes to be aligned directly across from each other
  - Install new, highly visible traffic signals and vehicle detection
  - Implement Flashing Yellow Arrow operations for left turns
  - Add pedestrian countdown timers & high visibility crosswalks

2018 Traffic and Safety Study Recommendations

- Consider improvements at Arch St. & Pearl St. Intersections:
  - Install new, highly visible traffic signals and vehicle detection
  - Implement Flashing Yellow Arrow operations for left turns
  - Add countdown pedestrian timers and high visibility crosswalk markings

2018 Traffic Study Results

- 4 Scenarios Evaluated:
  - 2018 Traffic and Existing Conditions
  - 2043 Traffic and Existing Conditions
  - 2043 Traffic and 4-Lane Cross Section with Modifications
  - 2043 Traffic and 3-Lane Cross Section with Modifications
- AM & PM Peak Hour Operations:
  - 7:15 – 8:15 AM
  - 3:15 – 4:15 PM

Level of Service (LOS)

- Based on delay
- Measured as A through F
- Signalized Intersections allow for longer delay
- LOS D is considered acceptable operations

Table 1. Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)	General Description
A	≤10	Free Flow
B	>10 – 20	Stable Flow (slight delays)
C	>20 – 35	Stable flow (acceptable delays)
D	>35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 – 80	Unstable flow (intolerable delay)
F[1]	>80	Forced flow (congested and queues fail to clear)

Source: *Highway Capacity Manual 2010*, Transportation Research Board, 2010.
1. If the volume-to-capacity (v/c) ratio for a lane group exceeds 1.0 LOS F is assigned to the individual lane group. LOS for overall approach or intersection is determined solely by the control delay.

Table 2. Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)
A	0 – 10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F[1]	>50

Source: *Highway Capacity Manual 2010*, Transportation Research Board, 2010.
1. If the volume-to-capacity (v/c) ratio exceeds 1.0, LOS F is assigned an individual lane group for all unsignalized intersections, or minor street approach at two-way stop-controlled intersections. Overall intersection LOS is determined solely by control delay.

2018 Traffic – Existing Geometry

- All movements operate at LOS D or above except for 3 movements
- LOS E during peak PM:
  - LT, TH, RT on WB Court St. at Crosby

Table 1: Year 2018 Existing Traffic Peak Hour Operating Conditions With Existing Geometrics and Traffic Control

Intersection	Traffic Control	Peak Hour	Level of Service, Delay (sec) and Queue Length per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
#100 - Court Street & Crosby Avenue Traffic Signal*	AM	LOS	C	C	C	C	C	C	B	C		B	C	
		Delay	27	27	27	29	29	29	14	28		16	23	
		Queue	-	180	-	-	170	-	90	320		85	205	
	PM	LOS	C	C	C	E	E	E	B	C		B	C	
		Delay	29	29	29	58	58	58	15	31		19	26	
		Queue	-	180	-	-	365	-	75	325		100	230	
#200 - Court Street & Grant Avenue One-Way Stop	AM	LOS	A	A	A	A	A	A	-			C		
		Delay	9	1	0	0	0	0	-			18		
		Queue	25	0	0	0	0	0	-			25		
	PM	LOS	A	A	A	A	A	A	-			C		
		Delay	10	1	0	0	0	0	-			21		
		Queue	25	0	0	0	0	0	-			30		
#300 - Court Street & Arch Street Traffic Signal	AM	LOS	A	A	A	A	A	A	B			B		
		Delay	7	7	7	7	7	7	11			12		
		Queue	-	70	-	-	65	-	25			40		
	PM	LOS	A	A	A	A	A	A	B			B		
		Delay	8	8	8	8	8	8	12			12		
		Queue	-	90	-	-	90	-	45			55		
#400 - Court Street & Oakhill Avenue One-Way Stop	AM	LOS	A	A	A	A	A	A	-			C		
		Delay	9	1	0	0	0	0	-			23		
		Queue	25	0	0	0	0	0	-			50		
	PM	LOS	A	A	A	A	A	A	-			D		
		Delay	10	1	0	0	0	0	-			32		
		Queue	25	0	0	0	0	0	-			85		
#500 - Court Street & Pine Street Two-Way Stop	AM	LOS	A	A	A	A	A	A	B			C		
		Delay	9	0	0	9	0	0	14			20		
		Queue	0	0	0	0	0	0	25			25		
	PM	LOS	A	A	A	A	A	A	C			B		
		Delay	9	1	0	9	0	0	22			13		
		Queue	0	0	0	0	0	0	25			25		
#600 - Court Street & Pearl Street Traffic Signal	AM	LOS	A	A	A	A	A	A	B			B		
		Delay	7	8	8	7	7	7	11			12		
		Queue	-	105	-	-	75	-	80			100		
	PM	LOS	A	A	A	A	A	A	B			B		
		Delay	8	8	8	8	8	8	11			12		
		Queue	-	100	-	-	105	-	60			115		

Table shows level of service, seconds of delay and 95th percentile queue lengths (in feet) in the three rows for each peak period.
* Results at Crosby Avenue intersection taken from HCM 2000, HCM 6th Edition doesn't report left-turn phasing from thru lanes.

2043 Traffic – Existing Geometry

- All movements operate at LOS D or above except for 6 movements
- LOS F during PM peak:
  - LT, TH, RT on WB Court St. at Crosby
  - LT, TH, RT on SB Oakhill Ave

Table 2: Design Year 2043 Traffic Peak Hour Operating Conditions With Existing Geometrics and Traffic Control

Intersection	Traffic Control	Peak Hour	Level of Service, Delay (sec) and Queue Length per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
#100 - Court Street & Crosby Avenue Traffic Signal*	AM	LOS	D	D	D	D	D	D	B	C		B	C	
		Delay	42	42	42	46	46	46	14	29		16	23	
		Queue	-	230	-	-	225	-	100	410		95	255	
	PM	LOS	D	D	D	F	F	F	B	C		B	C	
		Delay	50	50	50	230	230	230	14	34		18	27	
		Queue	-	240	-	-	500	-	85	420		110	285	
#200 - Court Street & Grant Avenue One-Way Stop	AM	LOS	A	A	A	A	A	A	-			C		
		Delay	9	1	0	0	0	0	-			22		
		Queue	25	0	0	0	0	0	-			35		
	PM	LOS	A	A	A	A	A	A	-			D		
		Delay	10	1	0	0	0	0	-			28		
		Queue	25	0	0	0	0	0	-			55		
#300 - Court Street & Arch Street Traffic Signal	AM	LOS	A	A	A	A	A	A	B			B		
		Delay	7	7	7	7	7	7	12			13		
		Queue	-	85	-	-	75	-	25			45		
	PM	LOS	A	A	A	A	A	A	B			B		
		Delay	8	8	8	8	8	8	13			14		
		Queue	-	105	-	-	105	-	60			65		
#400 - Court Street & Oakhill Avenue One-Way Stop	AM	LOS	A	A	A	A	A	A	-			D		
		Delay	9	1	0	0	0	0	-			32		
		Queue	25	0	0	0	0	0	-			75		
	PM	LOS	B	A	A	A	A	A	-			F		
		Delay	10	1	0	0	0	0	-			61		
		Queue	25	0	0	0	0	0	-			155		
#500 - Court Street & Pine Street Two-Way Stop	AM	LOS	A	A	A	A	A	A	B			C		
		Delay	9	0	0	9	0	0	16			23		
		Queue	0	0	0	0	0	0	25			25		
	PM	LOS	A	A	A	A	A	A	D			B		
		Delay	9	1	0	9	0	0	26			14		
		Queue	0	0	0	0	0	0	25			25		
#600 - Court Street & Pearl Street Traffic Signal	AM	LOS	A	A	A	A	A	A	B			B		
		Delay	7	8	8	7	7	7	13			14		
		Queue	-	145	-	-	100	-	105			130		
	PM	LOS	A	A	A	A	A	A	B			B		
		Delay	8	8	8	8	8	8	12			13		
		Queue	-	140	-	-	140	-	80			150		

Table shows level of service, seconds of delay and 95th percentile queue lengths (in feet) in the three rows for each peak period.
* Results at Crosby Avenue intersection taken from HCM 2000, HCM 6th Edition doesn't report left-turn phasing from thru lanes.

2043 Traffic – 4-lane with Modifications

- All movements operate at LOS D or above except for 6 movements
- LOS E during PM peak:
  - NB TH/RT on Crosby
  - SB LT on Crosby
- LOS F during PM peak:
  - LT, TH, RT on SB Oakhill Ave

Table 4: Design Year 2043 Traffic Peak Hour Operating Conditions With Modified Geometrics and Traffic Control – Scenario 1 (Four Lane Cross Section)

Intersection	Traffic Control	Peak Hour	Level of Service, Delay (sec) and Queue Length per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
#100 - Court Street & Crosby Avenue Traffic Signal*	AM	LOS	C	C	C	C	C	C	B	D		C	C	
		Delay	31	31	31	33	33	33	19	39		24	29	
		Queue	-	250	-	-	250	-	155	535		145	325	
	PM	LOS	C	C	C	D	D	D	C	**E**		**E**	D	
		Delay	32	32	32	54	54	54	29	76		74	42	
		Queue	-	215	-	-	410	-	155	585		285	380	
#200 - Court Street & Grant Avenue One-Way Stop	AM	LOS	A	A	A	A	A	A	-			C		
		Delay	9	1	0	0	0	0	-			22		
		Queue	25	0	0	0	0	0	-			35		
	PM	LOS	A	A	A	A	A	A	-			D		
		Delay	10	1	0	0	0	0	-			28		
		Queue	25	0	0	0	0	0	-			55		
#300 - Court Street & Arch Street Traffic Signal	AM	LOS	A	A	A	A	A	A	B			B		
		Delay	7	7	7	7	7	7	12			13		
		Queue	-	85	-	-	75	-	25			45		
	PM	LOS	A	A	A	A	A	A	B			B		
		Delay	8	8	8	8	8	8	13			14		
		Queue	-	105	-	-	105	-	60			65		
#400 - Court Street & Oakhill Avenue One-Way Stop	AM	LOS	A	A	A	A	A	A	-			D		
		Delay	9	1	0	0	0	0	-			32		
		Queue	25	0	0	0	0	0	-			75		
	PM	LOS	B	A	A	A	A	A	-			**F**		
		Delay	10	1	0	0	0	0	-			61		
		Queue	25	0	0	0	0	0	-			155		
#500 - Court Street & Pine Street Two-Way Stop	AM	LOS	A	A	A	A	A	A	B			C		
		Delay	9	0	0	9	0	0	16			23		
		Queue	0	0	0	0	0	0	25			25		
	PM	LOS	A	A	A	A	A	A	D			B		
		Delay	9	1	0	9	0	0	26			14		
		Queue	0	0	0	0	0	0	25			25		
#600 - Court Street & Pearl Street Traffic Signal	AM	LOS	A	A	A	A	A	A	B			B		
		Delay	7	8	8	7	7	7	13			14		
		Queue	-	145	-	-	100	-	105			130		
	PM	LOS	A	A	A	A	A	A	B			B		
		Delay	8	8	8	8	8	8	12			13		
		Queue	-	140	-	-	140	-	80			150		

Table shows level of service, seconds of delay and 95th percentile queue lengths (in feet) in the three rows for each peak period.
* Results at Crosby Avenue intersection taken from HCM 2000, HCM 6th Edition doesn't report left-turn phasing from thru lanes.

2043 Traffic – 3-lane Two-Way Left Turn Lane (TWLTL) with Modifications

- All movements operate at LOS D or above except for 3 movements
- LOS E during PM peak:
  - LT, TH, RT on SB Oakhill Ave

Table 5: Design Year 2043 Traffic Peak Hour Operating Conditions With Modified Geometrics and Traffic Control – Scenario 2 (Three Lane Cross Section)

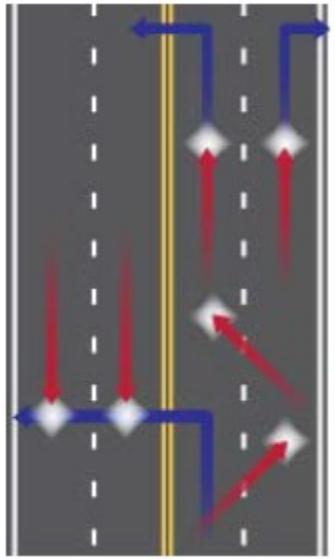
Intersection	Traffic Control	Peak Hour	Level of Service, Delay (sec) and Queue Length per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
#100 - Court Street & Crosby Avenue Traffic Signal*	AM	LOS	C	D	C	C	C	C	B	D		C	C	
		Delay	20	40	27	23	28	33	19	53		33	27	
		Queue	40	235	25	65	145	35	115	420		165	240	
	PM	LOS	C	D	D	D	D	C	B	D		D	C	
		Delay	25	49	35	45	41	33	19	50		38	27	
		Queue	35	290	30	150	305	30	100	395		200	265	
#200 - Court Street & Grant Avenue One-Way Stop	AM	LOS	A	A	A	A	A	A	-			C		
		Delay	9	0	0	0	0	0	-			20		
		Queue	25	0	0	0	0	0	-			35		
	PM	LOS	A	A	A	A	A	A	-			D		
		Delay	10	0	0	0	0	0	-			26		
		Queue	25	0	0	0	0	0	-			50		
#300 - Court Street & Arch Street Traffic Signal	AM	LOS	B	A		B	A		C			C		
		Delay	15	9		13	9		20			22		
		Queue	25	220		25	215		35			65		
	PM	LOS	B	A		B	A		C			C		
		Delay	13	9		13	9		21			22		
		Queue	25	360		25	350		95			120		
#400 - Court Street & Oakhill Avenue One-Way Stop	AM	LOS	A	A	A	A	A	A	-			C		
		Delay	9	0	0	0	0	0	-			25		
		Queue	25	0	0	0	0	0	-			55		
	PM	LOS	B	A	A	A	A	A	-			**E**		
		Delay	10	0	0	0	0	0	-			42		
		Queue	25	0	0	0	0	0	-			120		
#500 - Court Street & Pine Street Two-Way Stop	AM	LOS	A	A	A	A	A	A	C			C		
		Delay	9	0	0	9	0	0	15			18		
		Queue	0	0	0	0	0	0	25			25		
	PM	LOS	A	A	A	A	A	A	C			C		
		Delay	9	0	0	9	0	0	19			15		
		Queue	0	0	0	0	0	0	25			25		
#600 - Court Street & Pearl Street Traffic Signal	AM	LOS	B	A		B	A		B			B		
		Delay	11	9		12	7		17			18		
		Queue	40	330		25	240		135			170		
	PM	LOS	B	A		B	A		B			B		
		Delay	13	8		12	9		18			20		
		Queue	40	350		30	380		115			215		

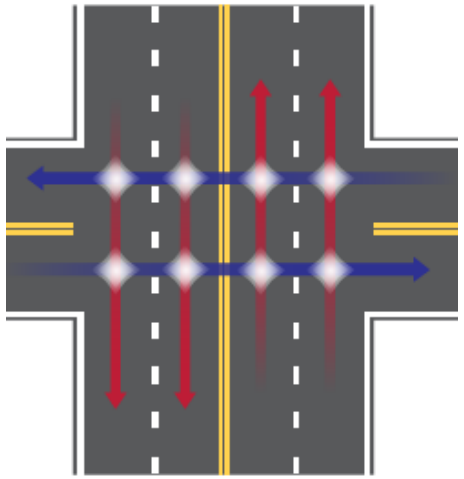
Table shows level of service, seconds of delay and 95th percentile queue lengths (in feet) in the three rows for each peak period.
* Results at Crosby Avenue intersection taken from HCM 2000, HCM 6th Edition doesn't report left-turn phasing from thru lanes.

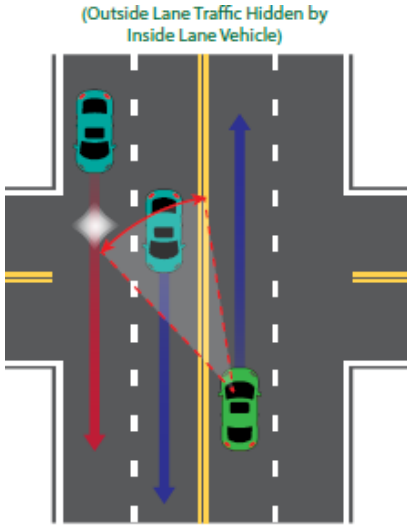
Reasons for Poor Safety Performance

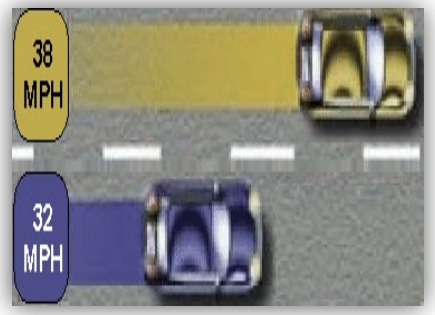
4-Lane Undivided Roadway Characteristics

- Roadway Conflict Points
- Intersection Conflict Points
- Hidden Vehicles
- Inconsistent Vehicle Speeds
- Ped/Bike Challenges
  - Long crossing distances
  - Lack of bicycle facilities
  - Lack of ped countdown timers/high-visibility crosswalks









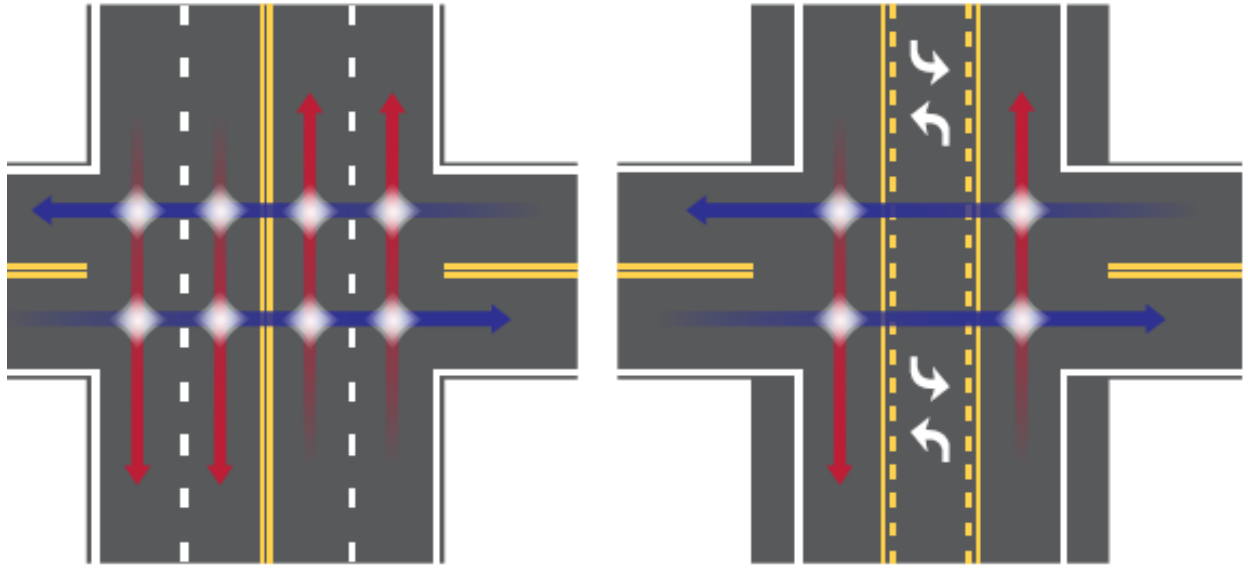
How Can We Improve Safety?

- Reduce conflict points
- Provide better visibility of approaching traffic
- Enable consistent vehicle speeds
- Improve pedestrian/bicycle accommodations
  - Shorter crossing distances
  - Dedicated bicycle lanes
  - Pedestrian countdown timers/high-visibility crosswalks
  - Strategically placed mid-block crossings

How Are These Objectives Accomplished

Consider a Safety Conversion

4-Lane Undivided to 3-Lane TWLTL*



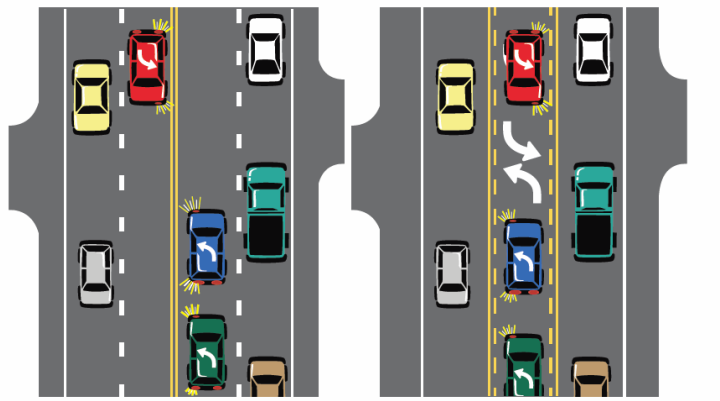
*Two-Way Left-Turn Lane

Objectives

- Reduce conflict points
- Provide better visibility of approaching traffic
- Make vehicle speeds more consistent
- Improve pedestrian/bicycle accommodations

What Is A Safety Conversion?

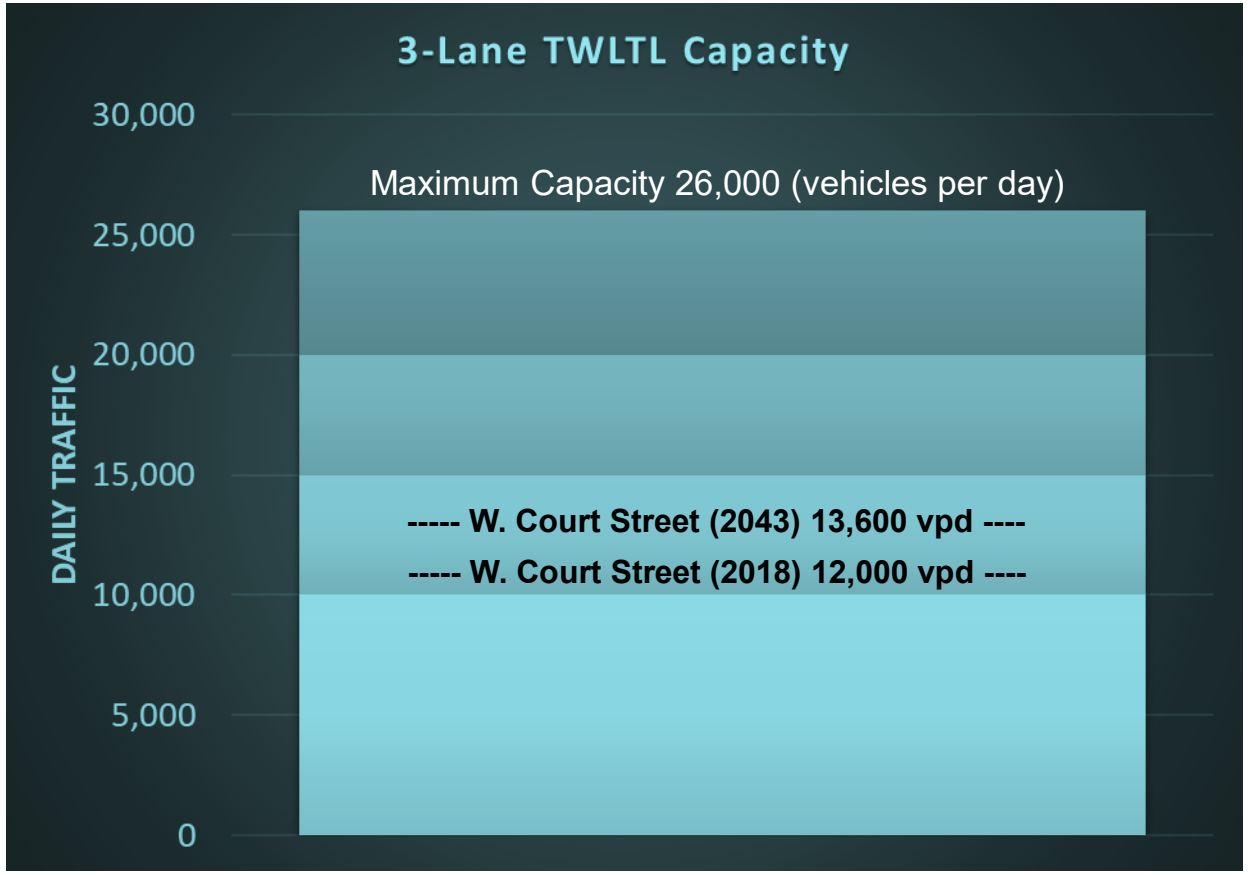
- Safety Conversion: when 4-lane undivided roadways are converted to 3-lane TWLTL
- Also called “Road Diets”



Before
A four-lane undivided road operating as a de facto three-lane cross section.

After
A Road Diet providing a two-way left-turn lane.

Why is West Court Street a Good Candidate



Safety Conversions

- Can handle a broad range of volumes
- Intersections may determine true capacity
- Level of service (LOS) isn't just for motorists
  - Better accommodations for pedestrians and bicyclists
  - Safety and more comfortable access to transit stops

Many Successful Safety Conversions

- STH 13 in Park Falls
- CTH A in Tomahawk
- Cass St. (STH 16) in La Crosse
- Clinton St. in La Crosse
- Monitor St. in La Crosse
- Stanley St. in Stevens Point
- USH 14 through Cross Plains
- USH 45 through Eagle River

Examples provided by Dan Tyler, WisDOT

STH 13 Park Falls, WI


New 3-Lane TWLTL STH 20 Waterford, WI

W. Murdock Ave. – Oshkosh WI

Safety Conversion Initially Opposed

West Murdock Avenue on Oshkosh's north side won't be going on a diet — at least for now.

The Oshkosh Common Council voted 6-1 Tuesday, June 9, 2015 to send a proposal to reconfigure West Murdock Avenue back to the Traffic Review Advisory Board and Bicycle and Pedestrian Advisory Committee.

thenorthwestern.com

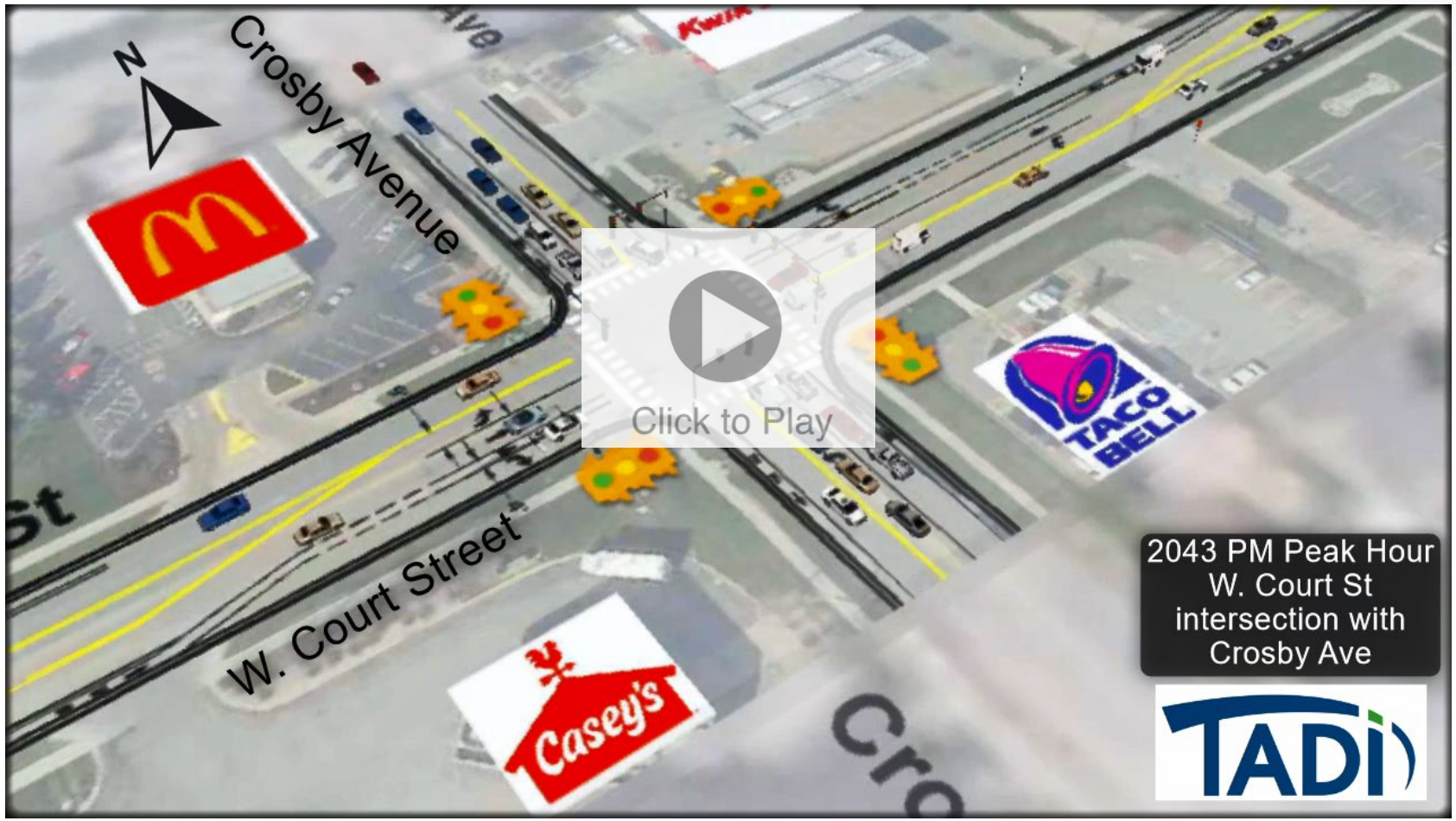
Extremely Successful Results

Crash Statistics*	Before (2010-2014)	After (2016-2019)	Percent Change
Total Crashes per Year	31.2	8.8	-72%
Injury Crashes per Year	12.4	2.75	-78%
Crash Rate per Million Entering Vehicles	1081	329	-70%
Serious Injury (A-Level) Crashes per Year	0.8	0	-100%
Pedestrian Crashes per Year	0.6	0	-100%
Bicycle Crashes per Year	0.8	0	-100%

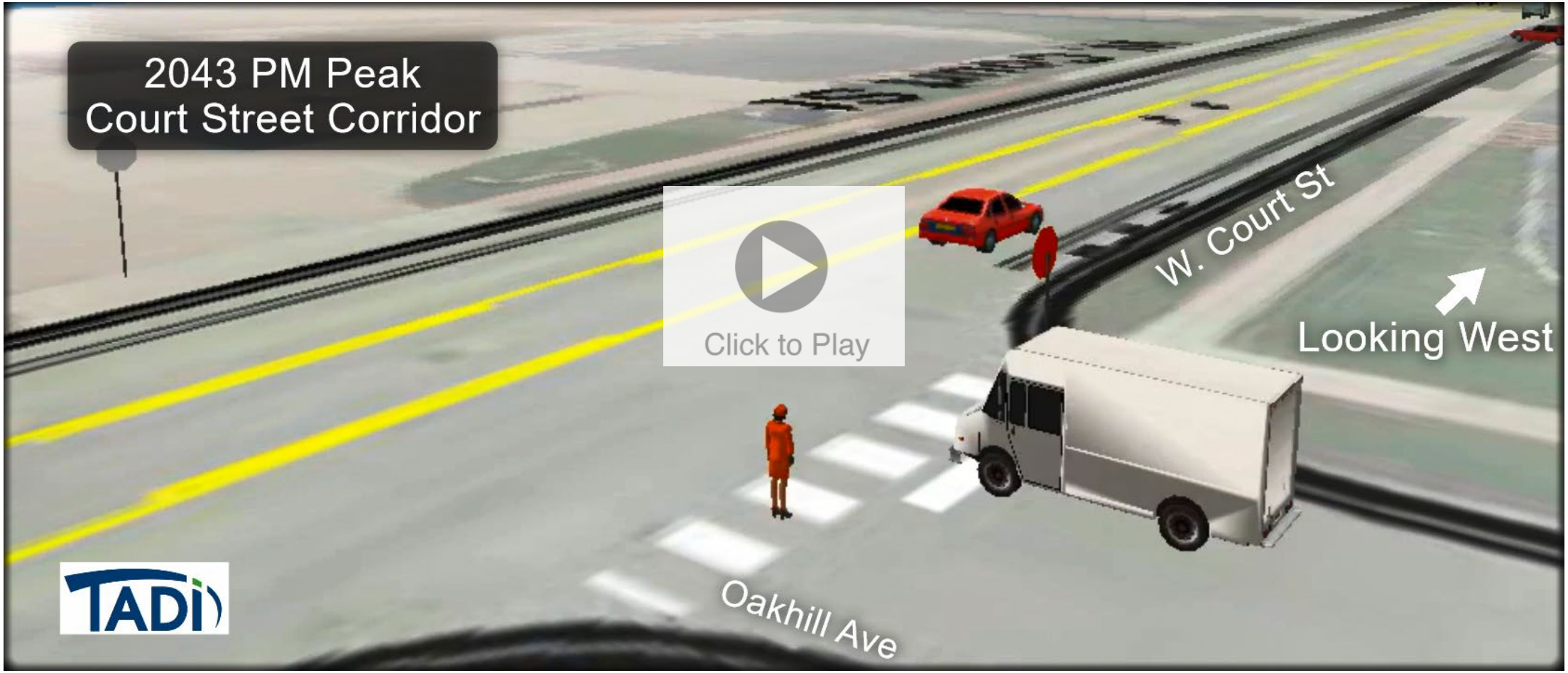
* Based on electronic crash data (individual hardcopies not reviewed)

2043 PM Complete Corridor Simulation

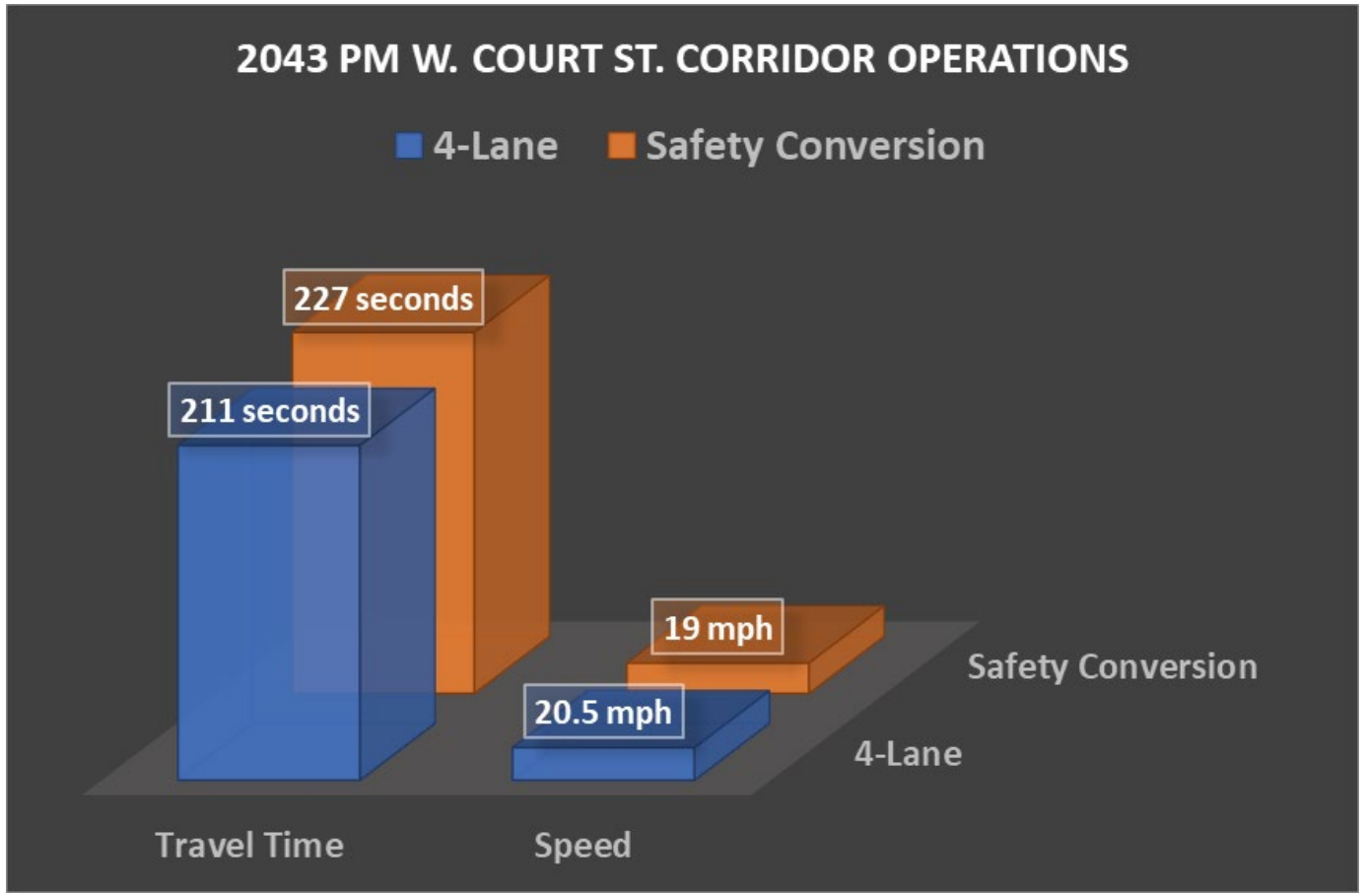
2043 PM Crosby Avenue Intersection Simulation



2043 PM Oakhill Ave
Gap Acceptance Simulation



2043 Corridor Delay & Travel Time



- Safety Conversion is expected to have:
  - Minimal impact on corridor travel time
  - Slight reduction in travel speeds

Crash Reductions = Real Impact

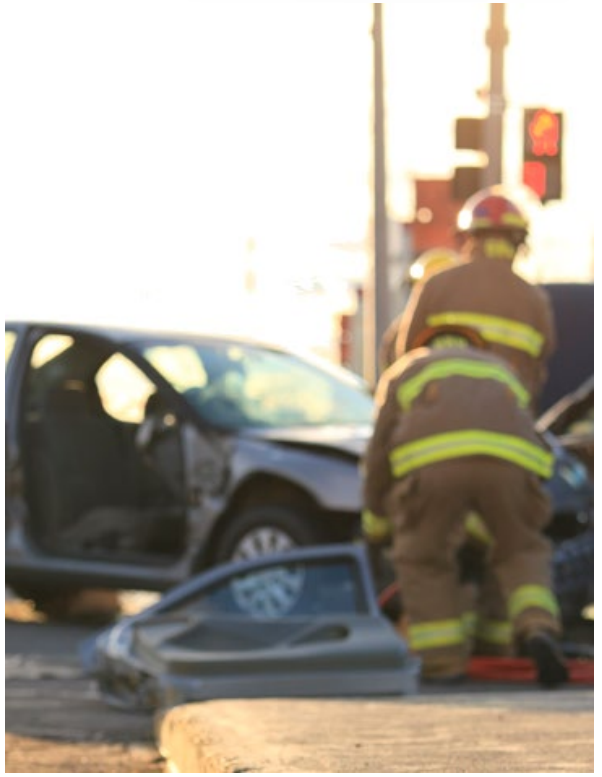
- If we achieve a 30% crash reduction on W. Court St. Over the next 10 years you'd see:

  ~ 100 fewer crashes

  ~ 100 fewer police responses

  ~ 200 vehicles not damaged

  Nearly <u>300</u> vehicle occupants not involved in a car crash

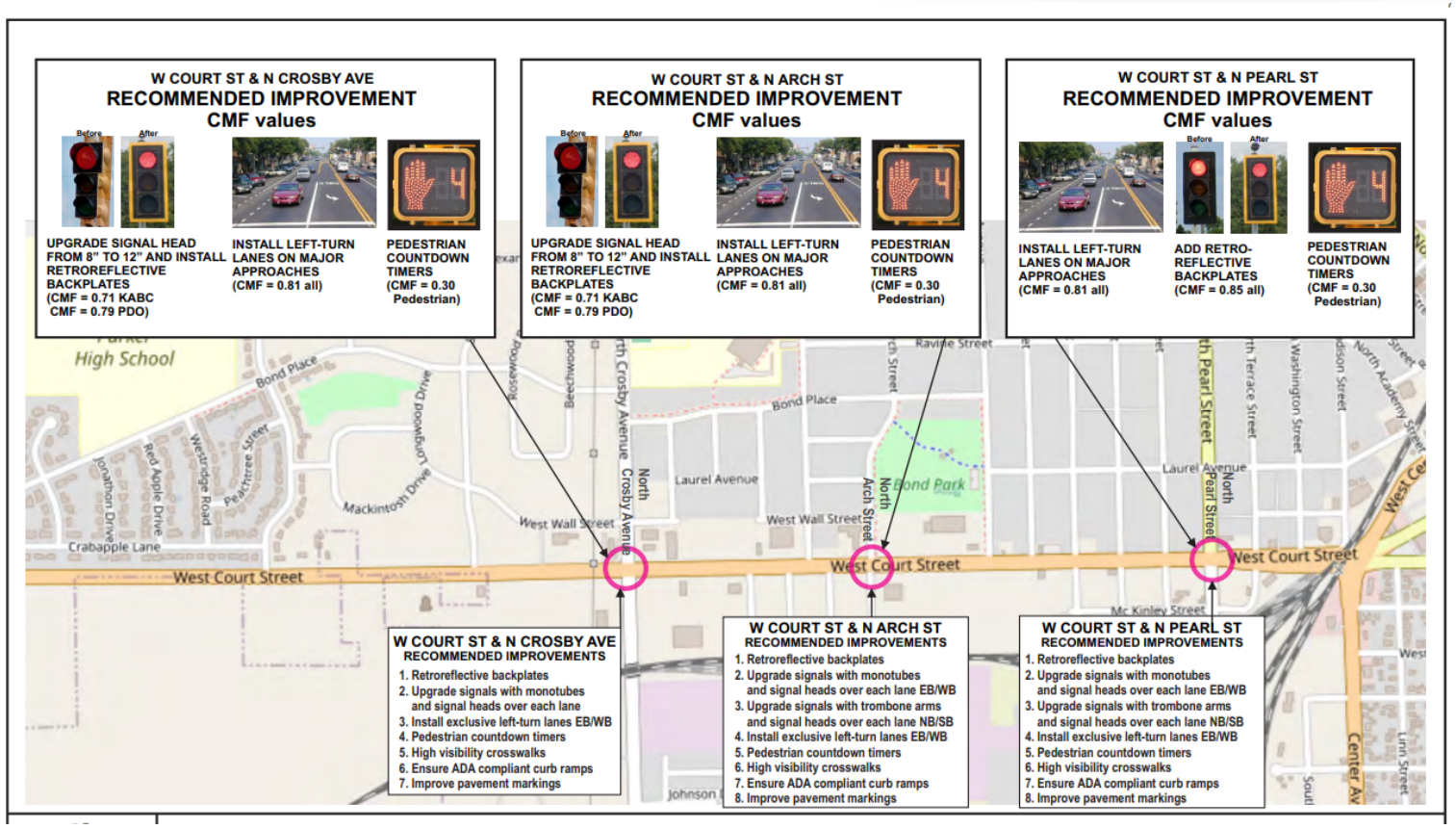


Resolution 2020-1800

- Authorized Staff to submit 2 HSIP applications:
  1. Intersection improvements at 3 signalized intersections; N. Crosby Ave., N. Arch St., N. Pearl St.
  2. Corridor improvements for a 3-lane TWLTL Cross Section, also referred to as a Safety Conversion
- Applications submitted August 15, 2020

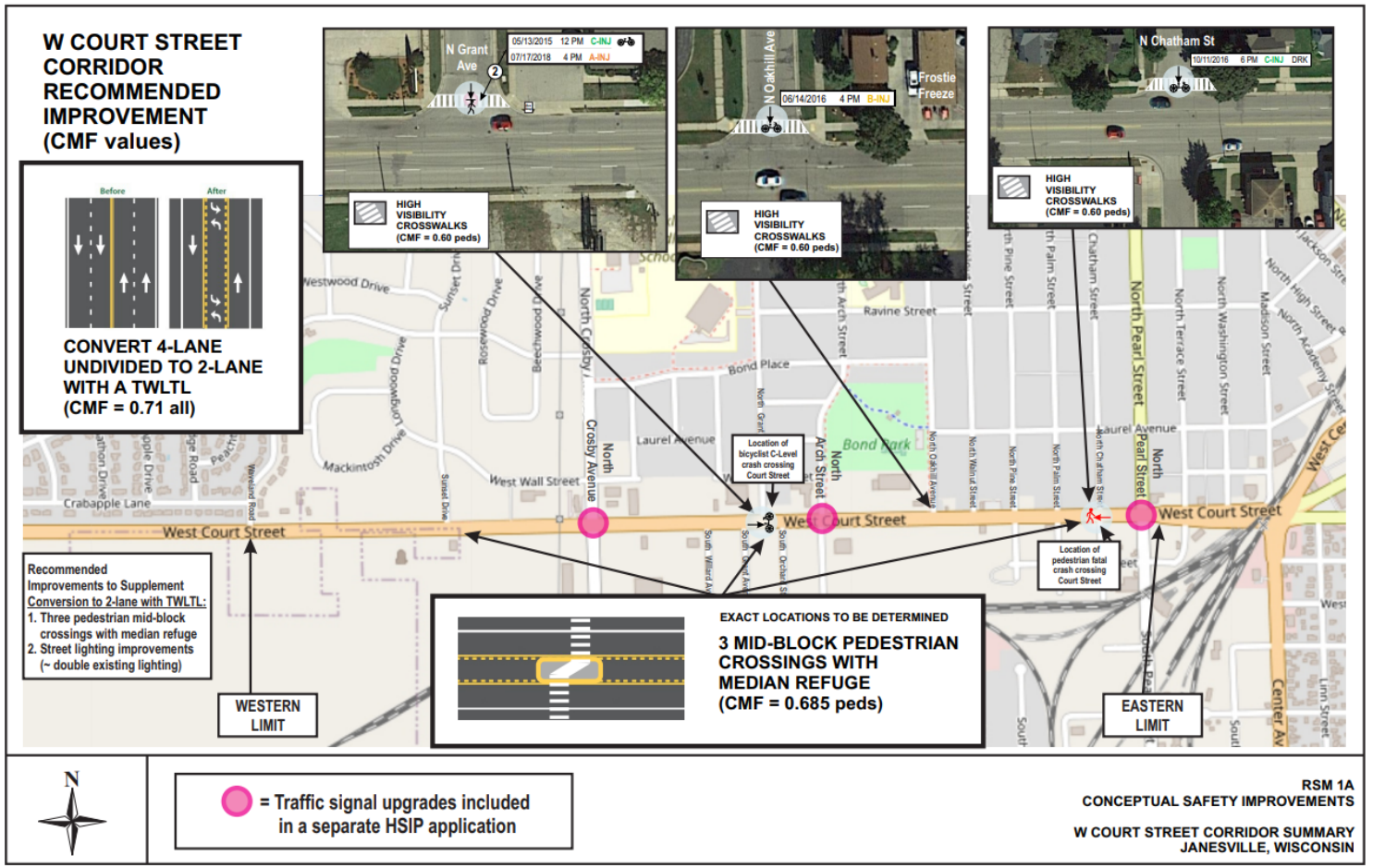
HSIP Application for 3 Signalized Intersections

- Enhance visibility of traffic signals
- Improve Traffic Operations
- Enhance Pedestrian Accommodations
- Improve Pavement Markings



HSIP Application for Corridor Safety Conversion

- Mill and overlay asphalt pavement
- New pavement markings for 3-lane TWLTL (2 Through Lanes + 1 TWLTL)
- High visibility crosswalk markings
- Mid-block pedestrian crossings
- On-street bike lanes
- Replace non-compliant accessible ramps



HSIP Funding Overview

Signalized Intersection Application

- Project Estimate for Design, Real Estate, and Construction
  - Total Cost: $1,809,000
  - Federal Share: $1,579,000
  - Local Share: $230,000

Corridor Safety Conversion Application

- Project Estimate for Design, Real Estate, and Construction
  - Total Cost: $2,200,000
  - Federal Share: $1,876,000
  - Local Share: $324,000

Schedule

- HSIP Grant Determination: December 2020
- WisDOT Agreement & Consultant Selection: 2021
- Begin Design: January 2022
- Begin Right-of-Way Acquisition: January 2023
- Construction: Spring 2025

Community Engagement

- Visit the Social Pinpoint Project Website to provide feedback
- Comments accepted through December 11, 2020

https://janesville.mysocialpinpoint.com/w-court-street-safety-improvements

Contact Information

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