

WIS 60 Corridor Study

Town of Cedarburg Meeting

Cedarburg Town Hall

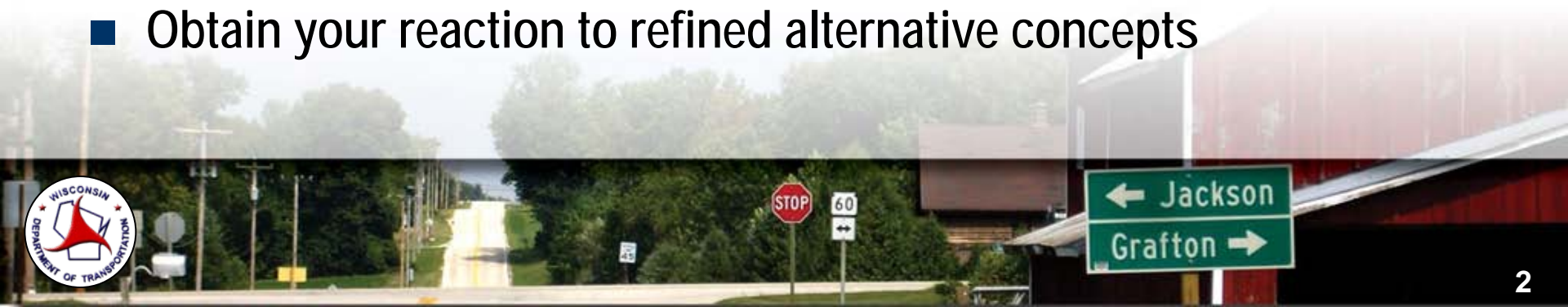
February 20, 2013





Meeting Purpose

- Allow Town to expand on comments provided after PIM No.1
- Understand Town's future vision for WIS 60
- Importance of WIS 60 to state trunk highway system
- Explain issues of public concern at PIM No.1
 - Crash rates
 - Level of service
 - 2040 traffic projections
 - Appropriate posted speeds on WIS 60
- Describe engineering constraints that guide design
- Obtain your reaction to refined alternative concepts





Town and City PIM No.1 Comments

■ Town Resolution (8-1-12)

- Opposed to preliminary alts. especially bypasses and excessive R/W
- Use current alignment and center improvements on current R/W
- Separate design for Five Corners and area east and west of it because of differences in traffic patterns and accidents
- Redesign County Y intersection immediately and add RAB or signal

■ Town Administrator letter (7-13-12)

- Eliminate huge median, clear zone and multi-use path
- Consider reducing posted speed to limit new R/W needed

■ City Resolution (9-10-12)

- Opposed to Five Corners bypasses (improvements along existing alignment)
- Reduce speed to 45 mph and minimize impacts to private property





Town and City PIM No.1 Comments

■ Ozaukee County (12-5-12)

- Opposes WisDOT's preliminary alternatives, including the bypass options and excessive right-of-way expansion
- Recommends using the current alignment
- Work with the local governments to establish an acceptable right-of-way





Public Information Meeting No. 1 Comment Summary

Washington County

Supports South Jackson bypass	1
Opposes South Jackson bypass	93
Opposes North Jackson bypass	98
Opposes both bypasses	62
Supports widening WIS 60	3
Opposes widening WIS 60 / Stay within existing R/W	10
Oppose entire project	23
Comments other than support or opposition	6

Ozaukee County

Supports Five Corners bypass	2
Opposes Five Corners bypass	69
Supports widening to the north side of WIS 60	12
Supports widening to the south side of WIS 60	3
Opposes widening WIS 60 to the south	8
Supports WIS 60 improvements	12
Oppose entire project	45
Opposes widening WIS 60	9
Comments other than support or opposition	16

- WisDOT received a “Petition to reject the proposed southern and northern bypass of Highway 60 in Jackson, Wisconsin.” The petition was signed by 482 people.
- WisDOT also received e-mails from 11 people indicating that they had signed the “Save Sherman Road in Jackson, Wisconsin” petition.

Note: The summary of comments focused on the primary theme in each comment received. Many comments contained multiple topics. The comment summary does not account for every statement made in each comment sent to WisDOT. The number of comments in the summary table are current as of the end of August 2012.





Please Keep in Mind

- This is a working meeting, ask questions at any time
- The intent of today's meeting is not to present information about alternatives that have been eliminated from consideration
- The alternatives discussed today are not intended to respond to all comments received at/after PIM No.1
- Your input today will help us make more informed decisions about the alternatives we bring to PIM No.2





Agenda

- Introductions
- Importance of WIS 60
- Frequently asked questions at PIM No.1
 - Results of WIS 60 speed study
 - How are crash rates developed?
 - How is level of service determined?
 - How were the 2040 traffic volumes developed?
- Refined alternative concepts
- What's Next?





Importance of WIS 60

- Long truck route connecting I-43 to US 45 and US 41
- Route on state's highway freight network
- Provides access to industrial parks in Grafton, Cedarburg, Jackson and Hartford
- Important arterial for growing population in study area
- Spans width of state



PIM Issues – Speed Study





Speeds Limits

- *WI State Statute 346.57(4)* establishes speed limits for roadways
- Traffic speed data was collected in the Town of Cedarburg in August 2012 (10 a.m. to 2 p.m.)
- *Wisconsin Statewide Speed Management Guidelines*: considers the 85th percentile speed of free flowing traffic under ideal road conditions to best represent the reasonable and proper speed for a roadway





Speed Study

■ Four locations evaluated

- Lizbeth Lane
- 0.35 mile east of Horns Corners Road
- Hilltop Drive
- Midway Between Keup Road and 1st Avenue

■ Posted Speed

- 55 mph at Lizbeth Lane and east of Horns Corners Road
- 45 mph at Hilltop Drive and between Keup Road and 1st Avenue





Speed Study Locations



Figure 1: Speed Data Capture Locations on STH 60



Speed Data – Town of Cedarburg

Location	Direction	Posted Speed Limit (mph)	Percentile Speed (MPH)				10 MPH Pace Speed
			15 th	50 th	85 th	95 th	
Lizbeth Lane	EB	55	52	56	60	62	52 - 61
	WB	55	52	57	60	63	52 - 61
0.35 Mile East of Horns Corners Road	EB	55	50	55	59	60	51 - 60
	WB	55	50	55	58	61	50 - 59
Hilltop Drive	EB	45	46	49	51	55	43 - 52
	WB	45	44	48	52	55	43 - 52
Midway between Keup Road and 1 st Avenue	EB	45	39	43	47	50	38 - 47
	WB	45	39	44	48	51	38 - 47

Percentile Speeds: The speed at or below which a certain percentage of observed traffic travels



PIM Issues – Crash Rates





WIS 60 Crash Rates

Crash Rates

Segment	Fatal	Injury A	Injury B	Injury C	Property Damage Only	Total
Jackson (US 45 to Eagle Drive)	0.0	16.4	27.3	41.0	215.8	300
Rural (Eagle Drive to County Line)	3.3	6.5	24.4	16.3	52.0	102
Rural (County Line to Five Corners)	2.2	6.7	11.1	13.4	44.6	78
Town of Cedarburg (Five Corners to Keup)	0.0	2.5	13.8	17.3	59.2	99
Grafton (Keup to 11th Avenue)	0.0	6.97	17.4	66.2	146.3	236.8

***Bold** values are above the statewide average.*

Statewide Average Rates 2006–2010

Small urban (Village of Jackson)	0.6	7.8	30.0	44.5	165.4	244
Rural highways with more than 3500, but less than 8700 ADT (Eagle Drive to Five Corners)	1.3	5.3	10.6	11.0	41.7	70
Large urban undivided highways (Town of Cedarburg)	1.4	10.1	37.4	74.4	219.9	343
Urban streets ^a (Village of Grafton)	0.62	6.26	28.2	51.8	204.4	291.4

Note: Rates are in 100 million vehicle miles traveled.

^aAverage of 5 years.





WIS 60 Crashes

Crash Severity (excluding deer crashes)

WIS 60 Segment	Fatal	Injury A	Injury B	Injury C	Property Damage Only	Total
Jackson (US 45 to Eagle Drive)	0	6	10	15	79	110
Rural (Eagle Drive to County Line)	2	4	15	10	32	63
Rural (County Line to Five Corners)	1	3	5	6	20	35
Five Corners	0	3	6	8	25	42
Town of Cedarburg (Five Corners to Keup)	0	1	8	7	24	40
Grafton (Keup to 11th Avenue)	0	2	5	19	42	68
Total	3	19	49	65	222	358
	0.8%	5.3%	13.6%	18.1%	62.1%	

Type of Crash: WIS 60 (Jackson to Grafton)

Segment	Angle	Rear-end	Sideswipe		Head-on	Fixed Object / Off Road	Deer	Total
			Same Direction	Opposite Direction				
Jackson (US 45 to Eagle Drive)	24	62	6	0	2	16	0	110
Rural (Eagle Drive to County Line)	19	13	6	3	1	21	30	93
Rural (County Line to Five Corners)	12	9	4	0	1	9	24	59
Five Corners	25	9	3	1	0	4	0	42
Town of Cedarburg (Five Corners to Keup)	5	20	1	1	1	12	4	44
Grafton (Keup to 11th Avenue)	30	19	6	1	0	12	4	72
Total	115	132	26	6	5	74	62	420
	27.9%	31.3%	6.1%	1.5%	1.2%	17.0%	15.0%	





We also take into consideration the severity of the crashes

The crash severity categories are:

- Property Damage Only
- Injury A – Incapacitating Injury
- Injury B – Non-incapacitating Injury
- Injury C – Possible Injury
- Fatal





Which road is more unsafe?

- One-mile segment with 10,000 vehicles per day and 5 crashes per year OR
- Two-mile segment with 25,000 vehicles per day and 9 crashes per year
- Just counting the number of crashes does not give a good indication of roadway safety





Which road is more unsafe?

- The crash rate expresses the safety of a road segment in terms of crashes per 100 million vehicle miles traveled

$$\text{Crash Rate} = \frac{\text{Crashes}}{100 \text{ Million Vehicle Miles}}$$

$$\text{Crash Rate} = \frac{\text{Number of Crashes} * 100,000,000}{365 * \text{Years} * \text{Average Daily Traffic} * \text{Length}}$$

- 365 days per year
- Years in the study period (5 years)
- Average daily traffic (vehicles/day)
- Length of road segment (miles)





Which road is more unsafe?

- One-mile segment with 10,000 vehicles per day and 5 crashes per year
Rate = 137
- Two-mile segment with 25,000 vehicles per day and 9 crashes per year
Rate = 49



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WisDOT has compiled the statewide average crash rate for various classes of roadways

Meta-manager State Trunk Highway Groups		Total	Fatal	A	B	C	Property Damage Only	
	1	Rural and Small Urban Freeways	39	0.3	1.8	4.5	4.7	27.4
	2	Rural and Small Urban Expressways	55	0.8	3.4	7.6	7.4	36.3
	3	Rural STN ADT between 3500 and 8700 ADT	70	1.3	5.3	10.6	11.0	41.7
	4	Rural STN ADT between 2000 and 3500 ADT	81	1.5	5.9	12.8	12.3	48.4
	5	Rural STN ADT between 750 and 2000 ADT	105	1.8	7.7	17.3	15.3	63.2
	6	Rural STN ADT less than 750	165	3.2	14.3	30.8	23.5	92.9
	7	Large Urban Freeways	78	0.3	1.7	6.3	14.2	55.6
	8	Large Urban Divided Highways and One Way	314	0.7	7.1	29.7	74.4	202.5
	9	Large Urban Undivided Highways	343	1.4	10.1	37.4	74.4	219.9
	10	Small Urban STN (excluding freeways, expressways...1 and 2 above)	232	0.7	7.3	24.4	41.1	158.4
	11	Rural STH ADT greater and 8700 ADT	67	0.9	4.1	8.6	11.1	42.1
12	Community of less than 5000 population STN	180	0.9	6.8	19.4	27.1	126.0	



PIM Issues - Forecasted Traffic Volumes





Traffic Forecasting Process

- Historic Traffic Growth
- Land Use trends
- Traffic Impact Analyses for Development
 - Five Corners - Cedarburg Business Park
 - Grafton West Subdivision

Roadway Segment	Existing Traffic 2010 AADT (vpd)	Future Traffic 2040 AADT (vpd)	Percent Increase
County Y to Five Corners	8,600	14,900	73
Five Corners-County I	13,800	24,000	74
County I-Keup Road	14,900	24,700	66



PIM Issues – Level of Service





Traffic Operations

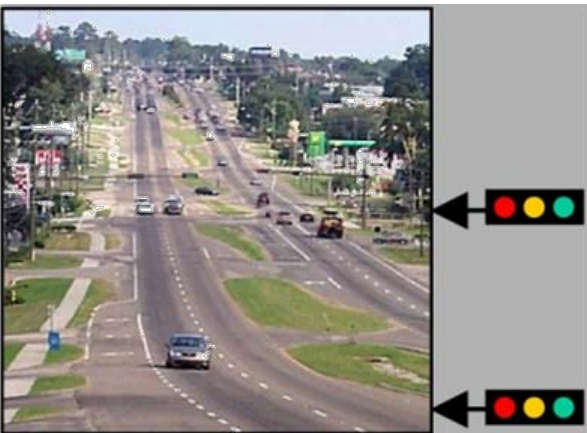
- Traffic operations are expressed in terms of Level of Service
- The Level of Service is evaluated using the Highway Capacity Manual Methodology
- Level of Service is evaluated for intersection operation and for roadway segments



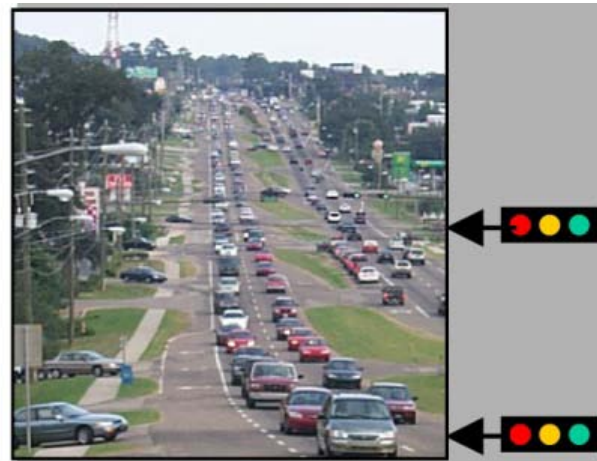


Level of Service

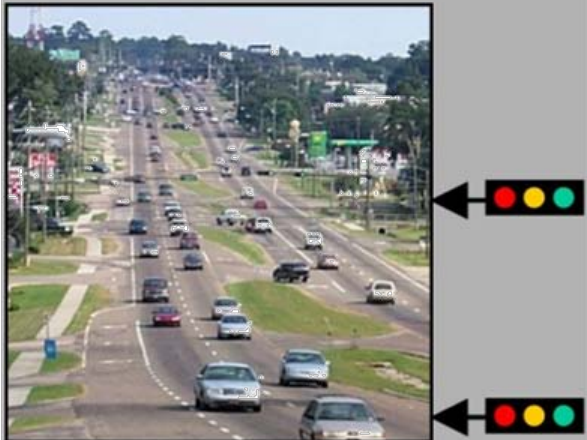
A/B



E/F



C/D



Source: Florida DOT Quality of Service Handbook, 2002





Level of Service

Existing and Design Year (Year 2040) Segment Level of Service for No Build Alternative

Highway Segment	Existing (2011 PM Peak)			Design Year (2040 PM Peak)		
	Average Travel			Average Travel Speed		
	Speed	LOS	Numeric Value	LOS	Numeric Value	
County P to Industrial	7.4	E	5.80	2.8	F	6.60
Industrial to Eagle Drive	17.0	C	3.33	6.9	F	6.02
Eagle Drive to County Line	40.4	D	4.91	36.3	E	5.19
County Line to WIS 181	37.9	E	5.10	33.1	E	5.35
WIS 181 to Keup Road	24.3	C	3.62	9.3	F	6.28
Keup Road to 11th Avenue	13.5	C	3.92	5.9	F	6.16



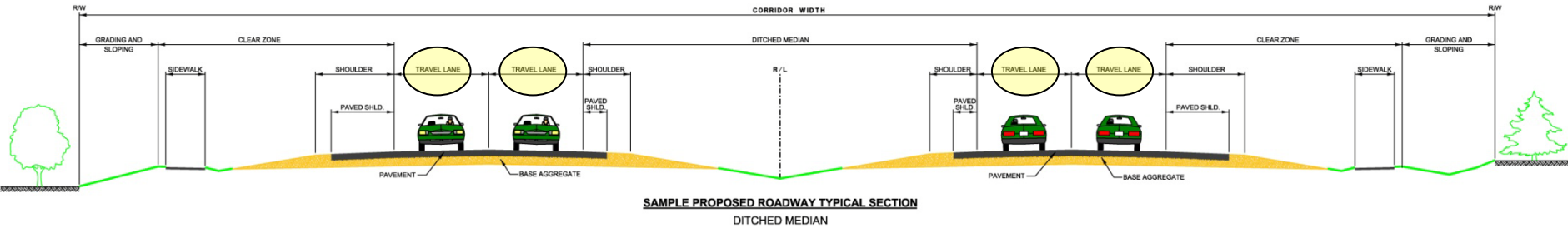
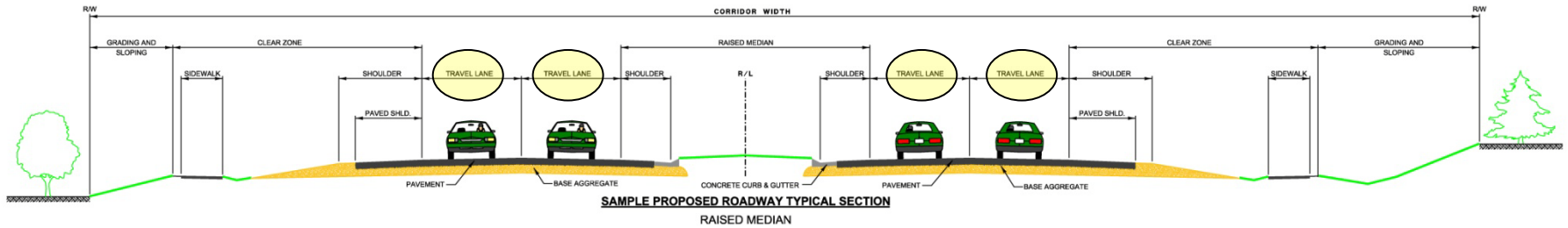
Refined Alternative Concepts





Roadway Features – Travel Lane

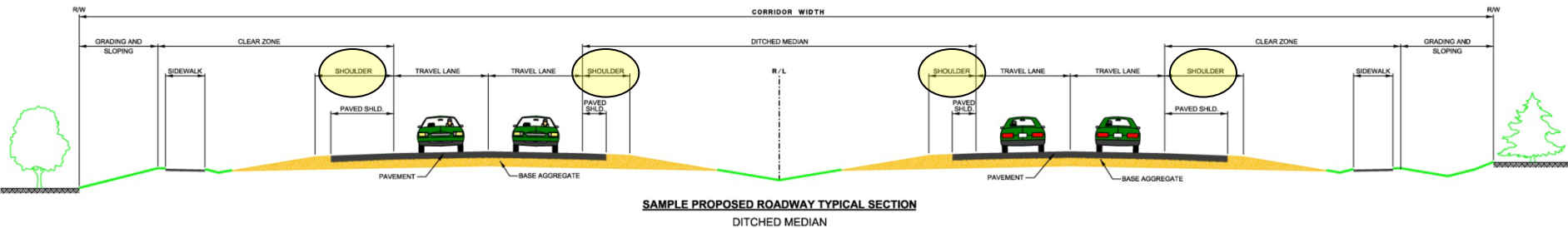
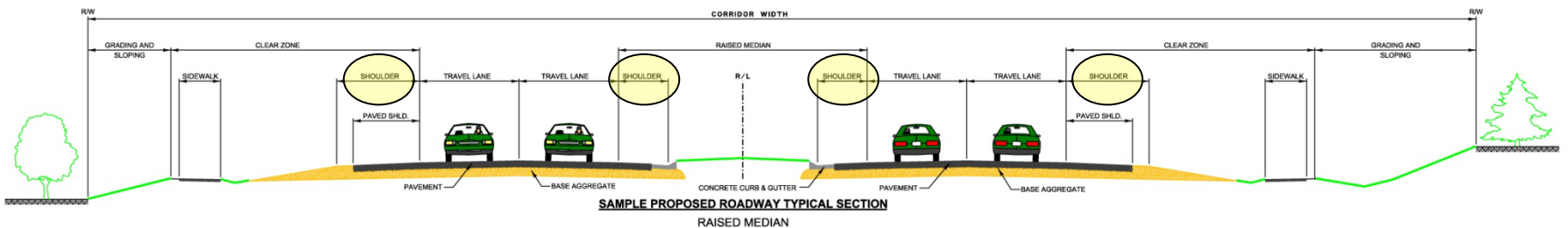
Roadway Feature	What is it?	Typical Dimension	Why is it important?
Travel Lane	Portion of roadway marked to guide drivers	12'	<ul style="list-style-type: none"> • Provides room for vehicles and space between vehicles • Wider lanes improve safety and traffic capacity • Wider lanes are necessary to accommodate arterial state highway traffic





Roadway Features – Shoulder

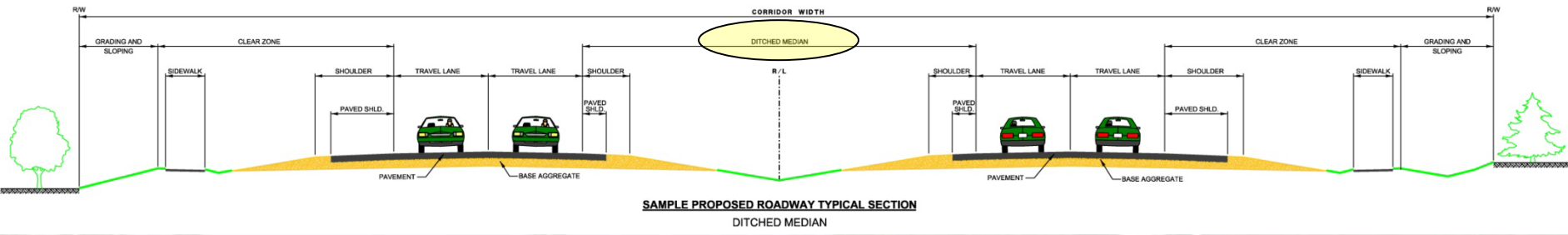
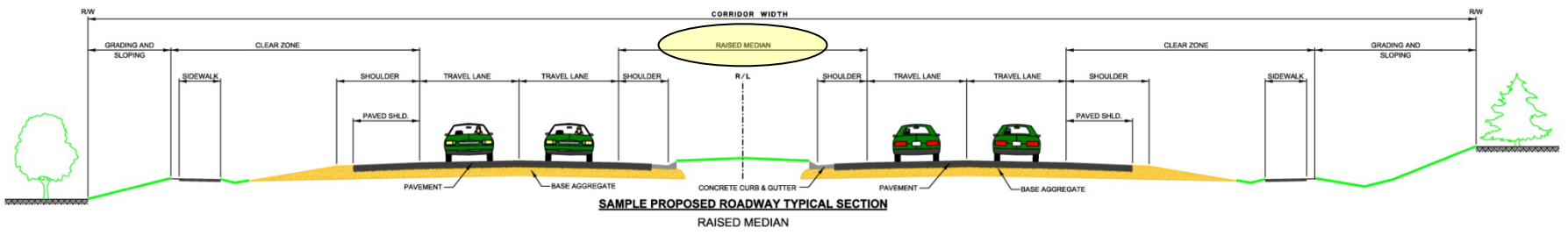
Roadway Feature	What is it?	Typical Dimension	Why is it important?
Shoulder	Additional paved and unpaved roadway width adjacent to travel lane	Inside: 4' – 6' Outside: 10'	<ul style="list-style-type: none"> Increases safety by providing additional space to avoid a collision Allows safe refuge for disabled vehicles, allows emergency vehicles to bypass traffic If paved, shoulders can provide room for bicycle accommodation





Roadway Features – Median

Roadway Feature	What is it?	Typical Dimension	Why is it important?
Median	Portion of the highway separating opposing traffic. Medians can be ditched or raised (with curb & gutter).	For high speed roadways: 30' minimum (raised) 50' desirable (ditched)	<ul style="list-style-type: none"> • Separates opposing traffic, reducing head-on collisions • Reduces conflicting turning movements, improving safety and traffic flow • Provides space for left turn lane, so turns are not made from travel lanes • Assists vehicles crossing highway or performing U-turns • If ditched, median provides stormwater treatment





Alternatives – Median Width (west of Five Corners)

- Median is required with 4-lanes and posted speed above 40 mph
- Advantages and disadvantages of 30' median vs. 50' median:

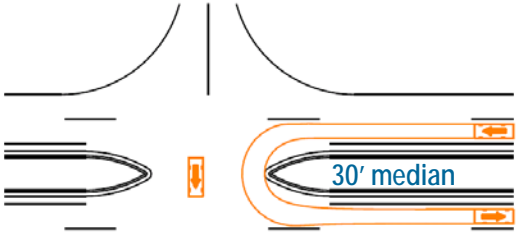
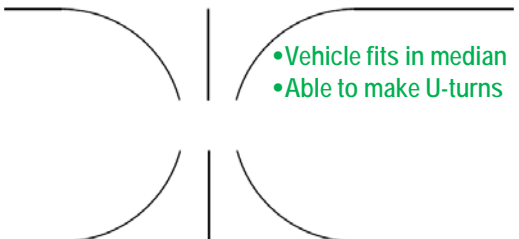
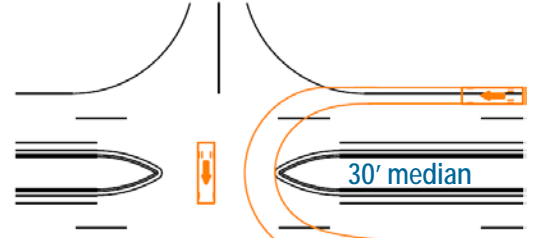
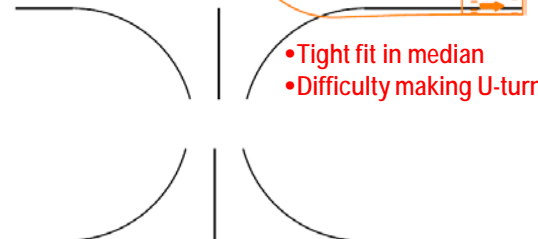
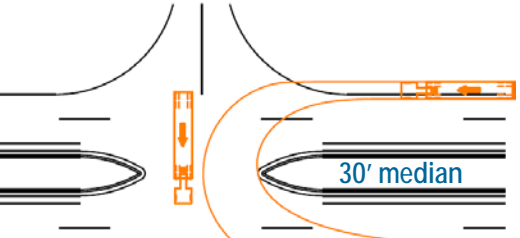
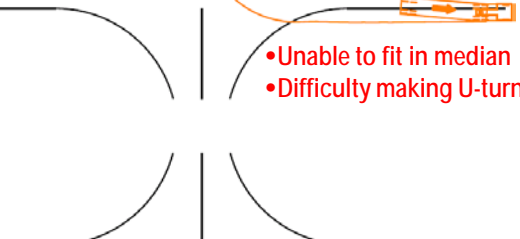
Roadway Cross Section	Advantages	Disadvantages
30' Median	<ul style="list-style-type: none"> • Decreased property impacts • Shorter pedestrian crossing 	<ul style="list-style-type: none"> • Less separation between opposing traffic • No median refuge for longer vehicles <ul style="list-style-type: none"> ○ Combine: approx. 34' long ○ School bus: approx. 36' long ○ Car and boat trailer: approx. 42' long ○ Snowmobile trail groomer: approx. 45' long ○ Semi truck: 46' and longer • Difficult U-turns for vehicles with larger turning radii • More headlight glare than 50' median
50' Median	<ul style="list-style-type: none"> • More separation between opposing traffic • Provides median refuge for longer vehicles • Accommodates U-turns for vehicles with larger turning radii • Less headlight glare than 30' median 	<ul style="list-style-type: none"> • Increased property impacts • Longer pedestrian crossing



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Alternatives – Median Width

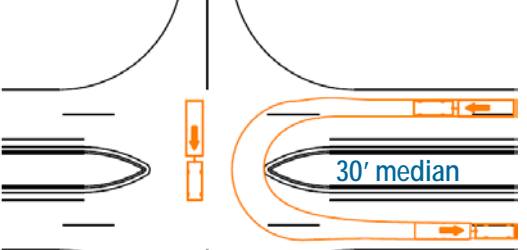
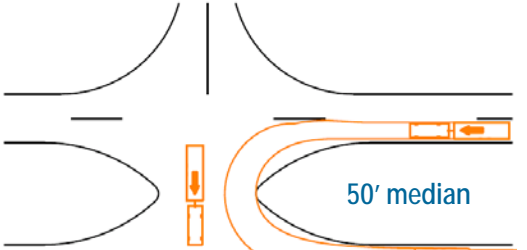
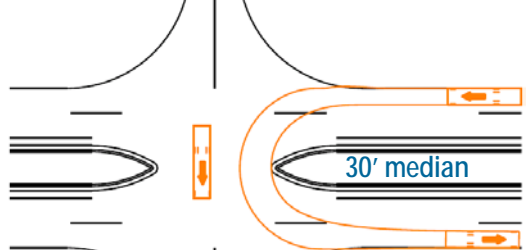
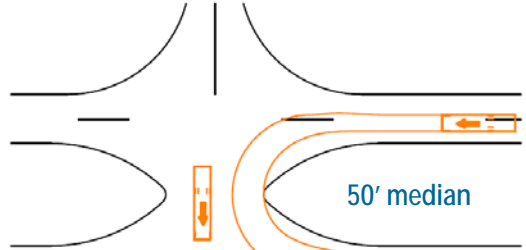
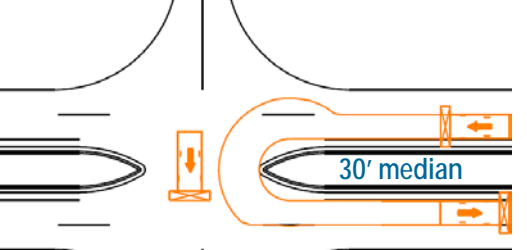
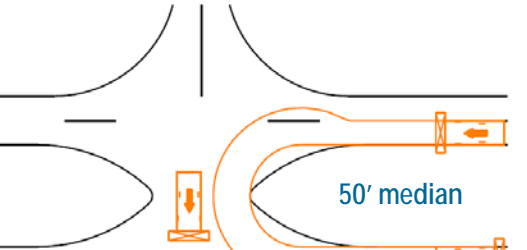
Note: turning radii are referenced to center of vehicle path

 <p>30' median</p> <ul style="list-style-type: none"> • Vehicle fits in median • Able to make U-turns  <p>50' median</p> <ul style="list-style-type: none"> • Vehicle fits in median • Able to make U-turns 	 <p>30' median</p> <ul style="list-style-type: none"> • Tight fit in median • Difficulty making U-turns  <p>50' median</p> <ul style="list-style-type: none"> • Vehicle fits in median • Difficulty making U-turns 	 <p>30' median</p> <ul style="list-style-type: none"> • Unable to fit in median • Difficulty making U-turns  <p>50' median</p> <ul style="list-style-type: none"> • Unable to fit in median • Difficulty making U-turns
<p>PASSENGER CAR vehicle length = 19' min. turning radius = 21'</p>	<p>SINGLE UNIT TRUCK (SU) vehicle length = 30' min. turning radius = 38'</p>	<p>INTERMEDIATE SEMITRAILER (WB-50) vehicle length = 55' min. turning radius = 41'</p>



Alternatives – Median Width

Note: turning radii are referenced to center of vehicle path

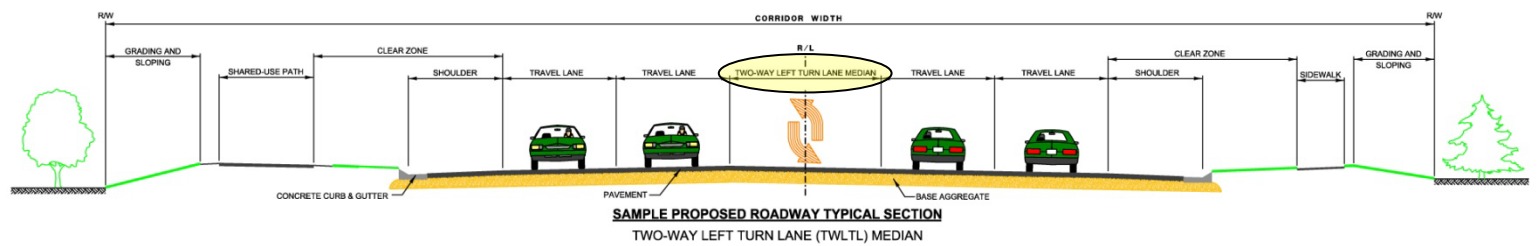
 <p>30' median</p> <ul style="list-style-type: none"> •Unable to fit in median •Difficulty making U-turns  <p>50' median</p> <ul style="list-style-type: none"> •Tight fit in median •Able to make U-turns 	 <p>30' median</p> <ul style="list-style-type: none"> •Unable to fit in median •Difficulty making U-turns  <p>50' median</p> <ul style="list-style-type: none"> •Vehicle fits in median •Able to make U-turns 	 <p>30' median</p> <ul style="list-style-type: none"> •Unable to fit in median •Able to make U-turns  <p>50' median</p> <ul style="list-style-type: none"> •Vehicle fits in median •Able to make U-turns
<p>PASSENGER CAR WITH TRAILER total vehicle length = 49' min. turning radius = 30'</p>	<p>CONVENTIONAL SCHOOL BUS vehicle length = 36' min. turning radius = 35'</p>	<p>COMBINE vehicle length = 33.5' min. turning radius = 18.3'</p>





Roadway Features – TWLTL

Roadway Feature	What is it?	Typical Dimension	When and why is it used?
TWLTL (two-way left turn lane)	Provides center lane for deceleration and storage of left-turning vehicles. A TWLTL is considered a median but is referred to as a flush median.	Low to moderate speeds: 14' – 16'	<ul style="list-style-type: none"> • Can work well for low to moderate speeds; not allowed on high speed facilities • Used in areas of traffic congestion with numerous left-turns and rear-end crashes • Appropriate use is for low volume access points (residential and low-volume commercial) • Suitable on roadways with moderate access point density • Separates opposing traffic, reducing head-on collisions • Provides room for left turning vehicles, improving safety and traffic flow





Alternatives – Median Type (east of Five Corners)

- 4-lane divided roadway
- 5-lane roadway with TWLTL (not allowed on high speed roadways)

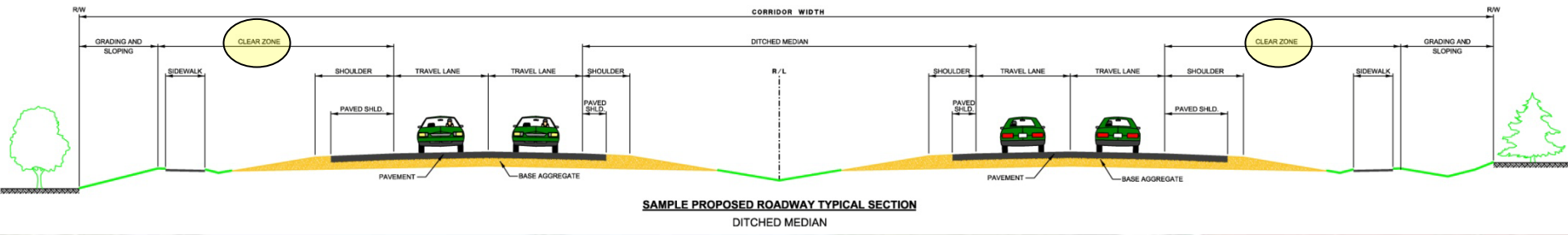
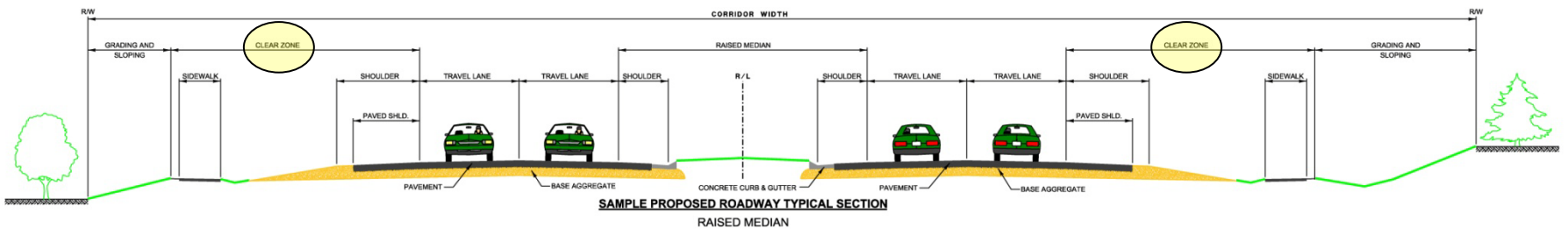
Roadway Cross Section	Advantages	Disadvantages
4-lane divided	<ul style="list-style-type: none"> • Increased safety due to fewer conflicts between vehicles • Provides refuge in median for errant vehicles • Provides wider median area for vehicles crossing or turning from side roads • Provides median area for snow storage • Less headlight glare than TWLTL median 	<ul style="list-style-type: none"> • Increased property impacts • Ability to turn left only at select locations results in some indirect travel routes
5-lane TWLTL	<ul style="list-style-type: none"> • Decreased property impacts • Ability to turn left at most locations (except near intersection approaches) 	<ul style="list-style-type: none"> • Decreased safety due to conflicts between turning and through traffic movements • Decreased safety due to narrower median width (less refuge for errant vehicles) • Left turn lanes at intersections preclude use of TWLTL at intersection approaches <ul style="list-style-type: none"> ○ Limits left turn ability near intersections ○ Intermittent use of TWLTL can cause driver confusion • Provides limited median space for vehicles turning or crossing from sideroads • No median area for snow storage • More headlight glare than 30' median





Roadway Features – Clear Zone

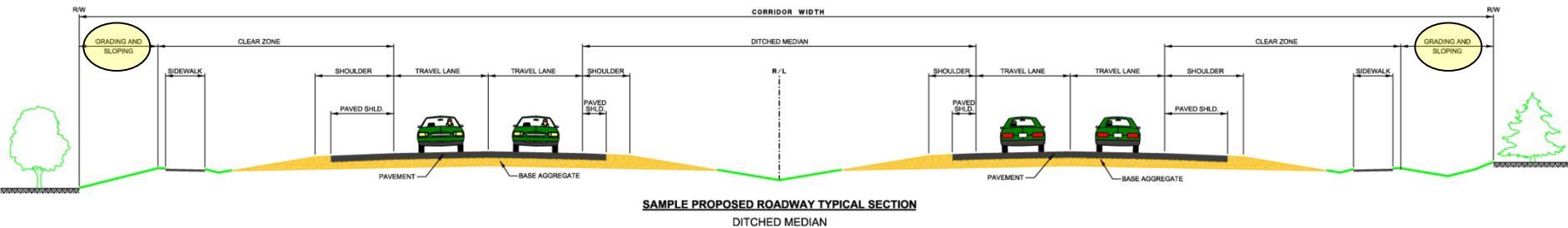
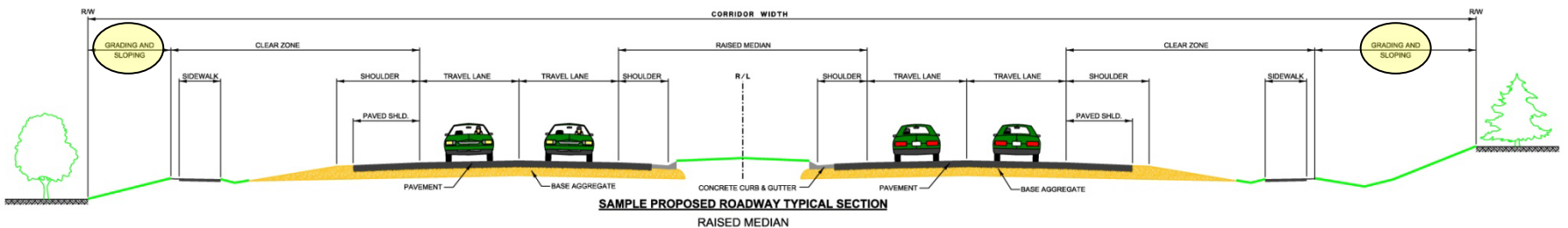
Roadway Feature	What is it?	Typical Dimension	Why is it important?
Clear Zone	Roadside area adjacent to outside travel lane, free from obstacles and steep slopes	20' (at 45 mph) 26' to 32' (at 55 mph)	<ul style="list-style-type: none"> Reduces crash rate and severity by providing gradual slopes and room for errant vehicles to recover Widths vary based on roadway speeds, curvature, traffic volumes, and roadside slopes





Roadway Features – Grading/Sloping Width

Roadway Feature	What is it?	Typical Dimension	Why is it important?
Grading and Sloping Width	A distance outside the roadway clear zone or shared-use path	Varies	<ul style="list-style-type: none"> Accommodates drainage Allows for blending in slopes with adjacent properties for aesthetics, mowing





Roadway Features – Pedestrian & Bicycle Accommodations

- **“Complete Streets” policy**
 - Federal policy requiring bicycle and pedestrian accommodations on new construction and reconstruction projects
 - WisDOT policy, State Statutes, and Administrative Code follow federal policy
 - DOT has responsibility to improve conditions and opportunities for walking and bicycling
- **Ped/Bike Accommodation Alternatives**
 - Shared-use path accommodates bicyclists and pedestrians
 - Sidewalk accommodates pedestrians
 - Paved shoulder can accommodate bicyclists; younger and casual bicyclists generally prefer shared-use paths





Alternatives – General

- **Conceptual alternatives depicted to get initial community input**
 - Roadway lines shown to better represent roadway layout
 - Intersection concepts developed
- **Reduced corridor width / proposed right of way**
 - Corridor width includes most ditching/sloping outside of roadway
 - Minor grading/sloping may be needed beyond corridor width
- **Approach for designating displacements**
 - Displacements occur when the proposed corridor width touches a building
 - Additional impacts may occur due to the proximity of the roadway to various features on adjacent properties





Alternatives – County Line to Five Corners

- **4-lane divided highway alternatives**
 - 30' and 50' median alternatives
- **Roadway alignment**
 - Currently shown to widen straight down the center of WIS 60
 - Alignment will be refined to further minimize impacts
- **Bicycle and pedestrian accommodations**
 - Sidewalk included for pedestrians
 - Bicycles to use paved shoulder
 - Shared use path included on north side east of Horns Corners Rd
- **Intersection concepts**
 - County Y





Alternatives – Five Corners to Grafton

- 4-lane divided highway alternative with 30' median
- Developed overlay for 5-lane TWLTL alternative
- Roadway alignment
 - Currently shown to generally widen straight down the center of WIS 60; alignment will be refined to further minimize impacts
 - East of County I, widening center impacts south side; widen north reduces impacts
- Bicycle and pedestrian accommodations
 - Sidewalk and shared used path included for pedestrians
 - Bicycles can use shared use path or paved shoulder
- Intersection concepts
 - County I, Keup Rd
 - Five Corners, WIS 181/Sycamore Dr



Sycamore Road to Five Corners Intersection





WIS 181-Sycamore Road Intersection

- 2009 feasibility study to evaluate a roundabout intersection at Sycamore Road to serve the future park
- WisDOT project began in 2010, TIA prepared
- 4-legged intersection compared to 5-legged roundabout
- 5-legged roundabout presented at public meeting because it provides access to park at Sycamore Road
- Incorporated in WIS 60 study to insure compatibility of operations at Sycamore Road and Five Corners intersection



60

Problems with a five leg signalized intersection

■ Inefficient operations

- The fifth leg runs by itself so the other four legs are delayed. At a four leg intersection complementary movements go through at the same time.

■ Safety

- With five legs there are turn movements where there is more than one place to turn to. When a driver puts on the turn signal other drivers are not sure where that vehicle is going. This leads to confusion that results in crashes.





Five Corners Intersection

Alternatives

- Four leg signalized intersection with Covered Bridge Road relocated
- Five leg roundabout
- Four leg roundabout with Covered Bridge Road relocated





What's Next?

- Complete community meetings in February
- Develop reasonable range of alternatives
- Hold PAC Meeting No.3 – Spring
- Local officials meeting – Spring
- Conduct Public Information Meeting No.2 – Summer

