

**Ordinance No. 2022-24**

**AN ORDINANCE TO CREATE SECTION 10-1-9 (d) (26) AND TO AMEND SECTION 10-1-9 (f) (11) OF THE CODE OF ORDINANCES OF THE VILLAGE OF CALEDONIA, RACINE COUNTY, WISCONSIN, RELATING TO SPEED LIMITS ON 4 MILE ROAD.**

The Village Board of the Village of Caledonia, Racine County, Wisconsin, do ordain as follows:

1. That Section 10-1-9 (d) (26) of the Code of Ordinances for the Village of Caledonia be, and hereby is, created to read as follows:

“(26) Four Mile Road – from its intersection with County Trunk Highway “V” to its intersection with the East Frontage Road of Interstate Highway “94”.

2. That Section 10-1-9 (f) (11) of the Code of Ordinances for the Village of Caledonia be, and hereby is, amended to read as follows:

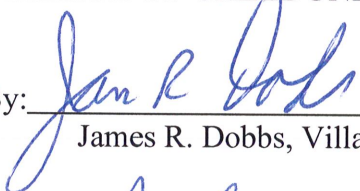
“(11) Four Mile Road – from its intersection with Short Road to its intersection with County Trunk Highway “V”

3. That this ordinance shall take effect after adoption and publication as provided by law.

Adopted by the Village Board of the Village of Caledonia, Racine County, Wisconsin, this 17 day of OCTOBER, 2022.

**VILLAGE OF CALEDONIA**

By: \_\_\_\_\_

  
James R. Dobbs, Village President


Attest: \_\_\_\_\_

  
Joslyn Hoeffert, Village Clerk

# MEMORANDUM

Date: October 5, 2022

To: Public Works Committee

From: Ryan Schmidt, P.E.  
Village Engineer 

Re: Speed Limit Reduction – 4 Mile Road (CTH V to East Frontage Road)

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## BACKGROUND INFORMATION

As part of the civil/site review for the Likewise “Pad C” development at 13301 4 Mile Road, the Engineering Department discovered some potential sight distance issues with the proposed eastern access. Engineering Staff made a field visit to determine the validity of the concern and then notified Pinnacle Engineering (Civil Engineer for the development) of the issue at hand. Pinnacle performed some preliminary analysis of the sight distance issue and determined it was worth exploring further.

As background, the newly constructed 4 mile road between the East Frontage Road and CTH V has large grade changes and vertical curves as part of the design. The proposed development had one access located at the top of the hill on the west side of their property and one located at the bottom of the hill on the east side of their property. Vehicles turning onto 4 Mile Road from the east approach would have trouble seeing and/or reacting to vehicles traveling at the posted speed of 45mph (or greater) over the top of the hill.

In order to ensure the safety and welfare of the traveling public, both along 4 Mile Road and from the development, the Village reached out to Pinnacle and requested a sight distance study be performed before any permitted access was allowed on the eastern approach. Pinnacle agreed that this would be an issue and hired T.A.D.I to perform the analysis. The technical report is attached with this memo.

The report summarizes that at a minimum, the posted speed limit would have to be reduced in order to allow the design vehicle (semi truck) to make a turn onto 4 Mile Road safely. Two options are recommended: reduce 4 Mile Road speed limit to 25 mph the entire stretch or to 35mph and require truck traffic to only make left hand turns out of the east approach. As it stands today, truck traffic is primarily traveling westbound along 4 mile from local commercial developments like CSW in order to access the East Frontage Road and get to Interstate 94. Staff would recommend the second alternative of reducing the speed limit to 35mph and restricting truck movements eastbound.

Geometric changes on site were considered with the developer but ultimately the speed limit reduction made the most sense. A speed limit reduction will promote a safer perceived speed for the residential properties along 4 Mile Road, will allow the desired multiple access points for the proposed development, and any future development that may occur on the north side of 4 Mile Road will be benefitted with safer sight distances for any future access point.

In order to make this change, SEC. 10-1-19 (d) and (f) shall be amended and signs are required to be purchased and installed. Signs are recommended to be installed with orange flags behind the newly posted speed limit signs to assist with the general public's view of the newly posted speed.

**RECOMENDATION:**

**Move to recommend to the Legislative and Licensing Committee that Ordinance 10-1-19 (d) (26) is created and that Ordinance 10-1-19 (f) (11) is amended to modify the speed limit along 4 Mile Road between the East Frontage Road and CTH V to 35mph.**

**Move to recommend to the Village Board that Ordinance 10-1-19 (d) (26) is created and that Ordinance 10-1-19 (f) (11) is amended to modify the speed limit along 4 Mile Road between the East Frontage Road and CTH V to 35mph.**

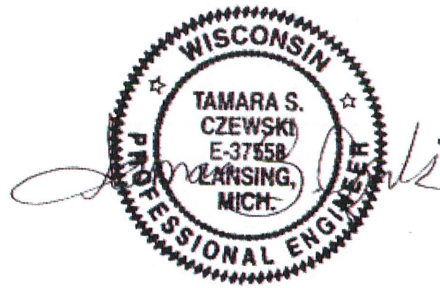
## TECHNICAL MEMORANDUM

**Date:** September 12, 2022

**To:** Matthew Carey, P.E.  
Pinnacle Engineering Group

**From:** Tammi Czewski, P.E., PTOE  
Traffic Analysis & Design, Inc.

**Subject:** **Sight Distance Analysis**  
**Deback Farms Lot C: East Site Driveway to 4 Mile Road**



### Introduction

This technical memorandum was prepared to evaluate the east driveway intersection and stopping sight distance for a proposed light industrial building on Lot C of the Deback Farms development at 13301 Four Mile Road, Caledonia, Wisconsin. The east driveway is located in a “valley” on Four Mile Road with hills to the east and west that impact visibility for turns at the east site driveway. Mitigation measures considered in this report include restricting access for some vehicle types and reducing the speed limit on Four Mile Road to reduce the required sight distance.

The location of the proposed development and site driveways is shown on Exhibit 1. The majority of the development’s vehicle and truck trips are expected to access the site to/from the west on Four Mile Road. Four Mile Road connects to the I-94 East Frontage Road, which leads to the I-94 interchange at CTH K. The east driveway on Lot C is currently being graded for buildout and the speed limit on Four Mile Road (two-lane undivided roadway) is posted at

### Sight Distance Analysis

The sight distance analysis was conducted according to the American Association of State Highway and Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets, 2001* and on procedures identified in Chapter 11 of the Wisconsin Department of Transportation’s (WisDOT) Facilities Development Manual (FDM). Per the FDM, a single-unit (SU) truck should be considered the design vehicle at this location unless combination (WB) trucks are significant. The development sight plan (Exhibit 2) shows

truck loading areas on the south side of the proposed building. Therefore, this study evaluates the sight distance requirements for passenger cars, SU trucks, and WB trucks.

TADI took field photos from the east site driveway to the west and east on Four Mile Road to a 3.5-foot target (“object”) positioned within the approaching travel lane. The intersection sight distance (ISD) photos were taken from a position 14.5 feet from the southern edge of Four Mile Road at eye heights of 3.5 feet (representing the eye height of a person in a passenger car) and 7.6 feet (representing the eye height of a person in an SU or WB truck). Eye height adjustments were made to account for the proposed grade of the future east driveway with respect to the current elevation at the photo position. Photos to the left of the east site driveway represent the ISD for a vehicle making a right-turn exit (Exhibit 3), and photos to the right of the east site driveway represent the ISD for a vehicle making a left-turn exit (Exhibit 4).

TADI also took field photos from the eastbound travel lane on Four Mile Road to a 2.0-foot target positioned at the east site driveway (Exhibit 5). The stopping sight distance (SSD) photos were taken at a 3.5-foot eye height.

For both the ISD and SSD photos, the targets or photo positions were moved until the maximum visibility was reached. The maximum visibility for each design vehicle was then recorded as shown in Table 1 below.

**Table 1. Sight Distance Requirement Matrix & Maximum Visibility**

Design Speed	Intersection Sight Distance						Stopping Sight Dist (EB)
	Right-Turn from East Driveway Design Vehicle			Left-Turn from East Driveway Design Vehicle			All
	P	SU	WB	P	SU	WB	
30 mph	290'	375'	465'	335'	420'	510'	200'
35 mph	335'	440'	540'	385'	490'	595'	250'
40 mph	385'	500'	620'	445'	560'	675'	305'
45 mph	430'	565'	695'	500'	630'	760'	360'
50 mph	480'	625'	775'	555'	700'	845'	425'
Max Visibility	400'	500'	500'	>975'	>1125'	>1125'	375'
Eye Height	3.5'	7.6'	7.6'	3.5'	7.6'	7.6'	3.5'
Object Height	3.5'	3.5'	3.5'	3.5'	3.5'	3.5'	2.0'

Notes:  Indicates that the maximum visibility meets or exceeds the required sight distance for that design speed. Design speed is evaluated as five mph over the posted speed limit.

Table 1 also shows the ISD and SSD requirements for each design vehicle and design speed ranging from 30 mph to 50 mph. The design speeds are evaluated at five mph over the posted speed limit, so the 50-mph design speed represents the existing posted speed limit and sight distance requirements on Four Mile Road. As shown, the maximum visibilities for eastbound SSD and right-turn driveway exit ISD are less than what is required for the existing posted speed limit. Lowering the speed limit to 40 mph (design speed of 45 mph) allows the eastbound stopping sight distance requirements to be met. Lowering the speed limit to 35 mph (design speed of 40 mph) allows the right-turn exit ISD to be met for

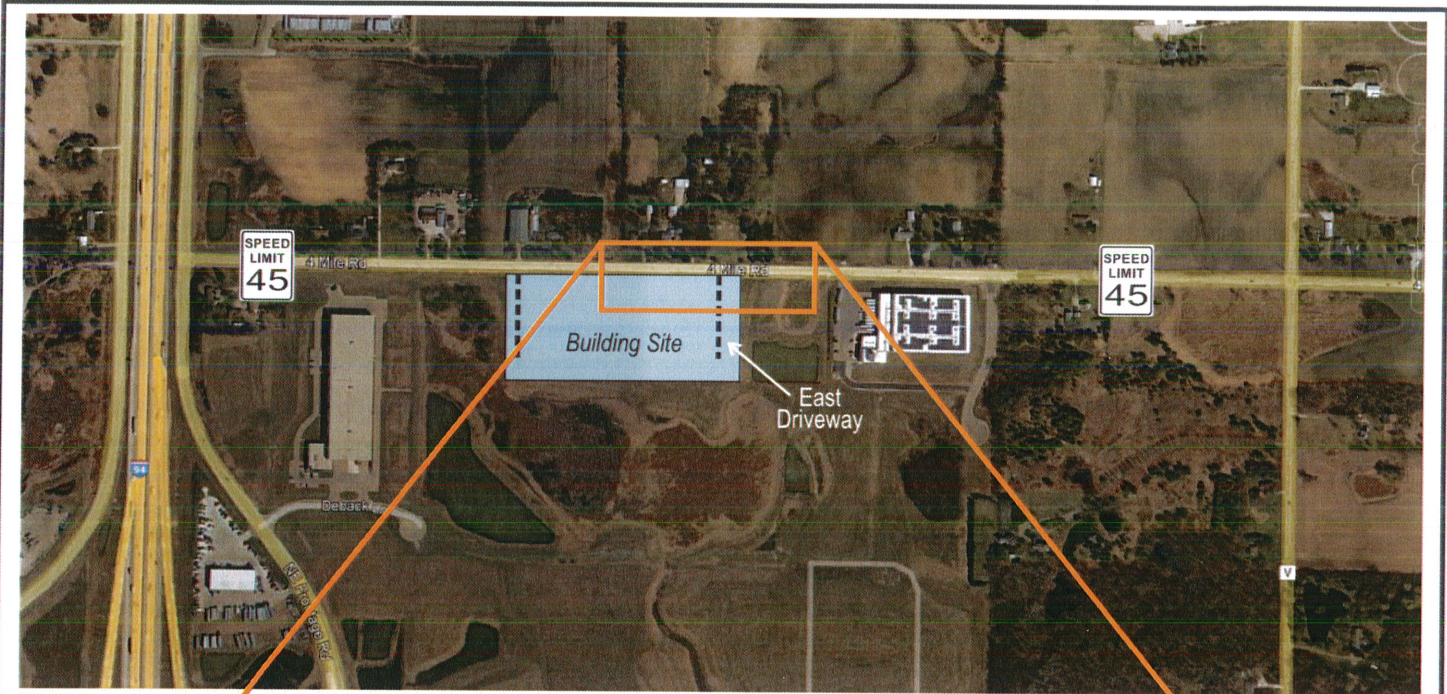
passenger cars and SU trucks. Lowering the speed limit to 25 mph (design speed of 30 mph) allows the right-turn exit ISD to also be met for WB trucks.

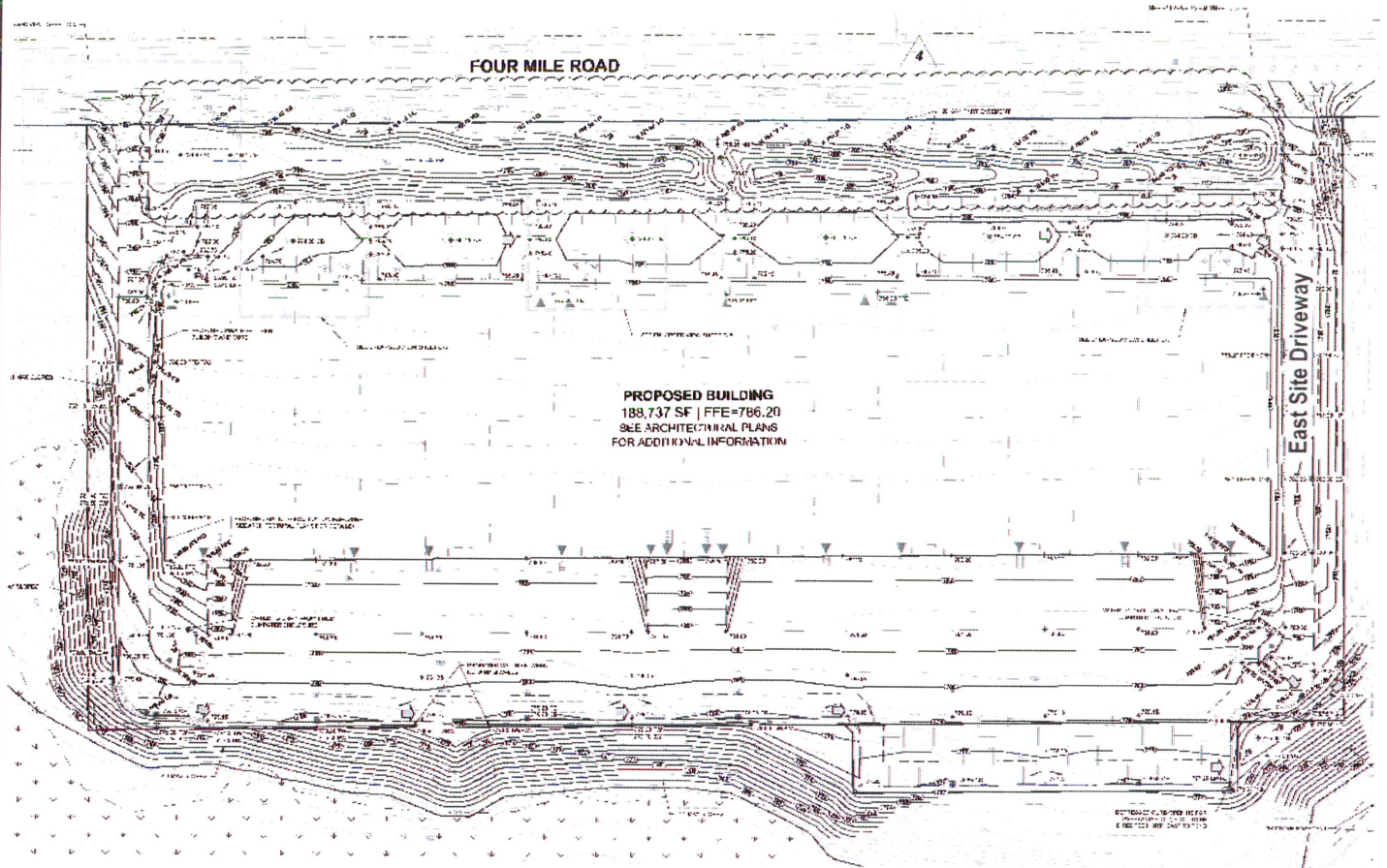
### **Recommendations**

In order to fully mitigate visibility issues for all design vehicles at the east site driveway, it is recommended that the speed limit for eastbound traffic on 4 Mile Road be lowered to 25 mph from the East Frontage Road to east of the east site driveway (Recommendation A). The speed limit for westbound traffic can also be lowered for continuity, but is not necessary for meeting sight distance requirements.

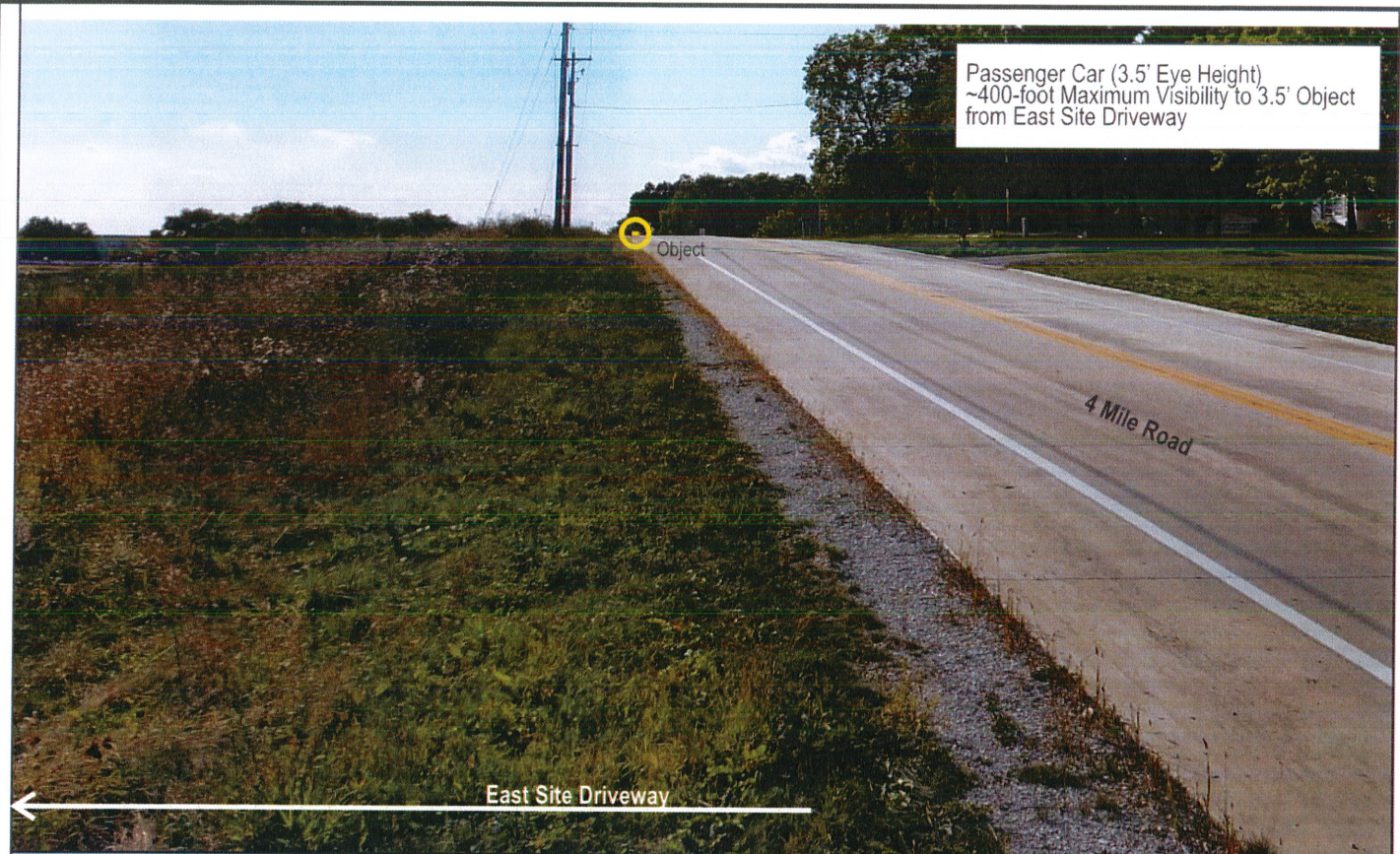
Alternatively, reduce the speed limit on 4 Mile Road to 35 mph (Recommendation B), and post a sign restricting WB trucks from exiting east onto eastbound 4 Mile Road.

These recommendations are shown on Exhibit 6.









Passenger Car (3.5' Eye Height)  
~400-foot Maximum Visibility to 3.5' Object  
from East Site Driveway



SU & WB Truck (7.6' Eye Height)  
~500-foot Maximum Visibility to 3.5' Object  
from East Site Driveway



Passenger Car (3.5' Eye Height)  
 >975-foot Maximum Visibility to 3.5' Object  
 from East Site Driveway



SU & WB Truck (7.6' Eye Height)  
 >1,125-foot Maximum Visibility to 3.5' Object  
 from East Site Driveway

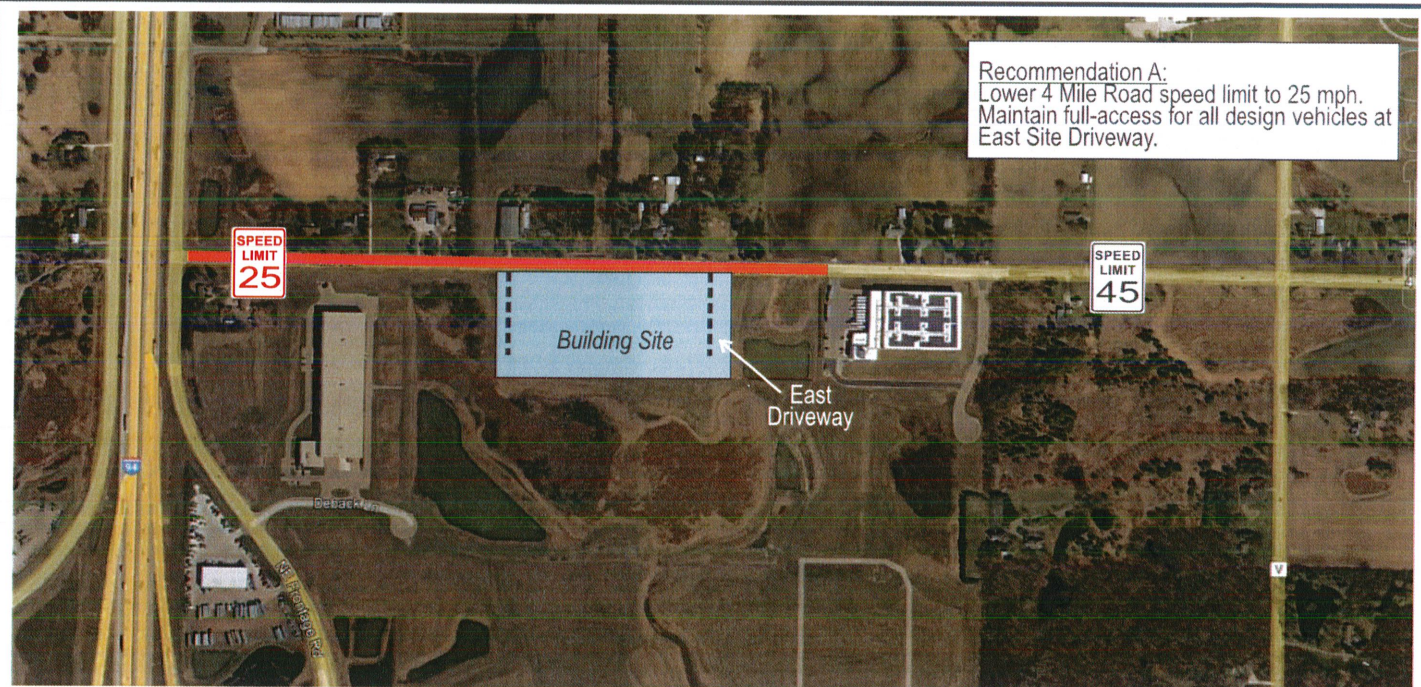


3.5' Eye Height  
375-foot Maximum Visibility to 2.0' Object  
at East Site Driveway

4 Mile Road

Object

East Site Driveway



Recommendation A:  
 Lower 4 Mile Road speed limit to 25 mph.  
 Maintain full-access for all design vehicles at  
 East Site Driveway.



Recommendation B:  
 Lower 4 Mile Road speed limit to 35 mph.  
 Restrict Trucks from exiting right at East Site  
 Driveway

# **INTERSECTION SIGHT DISTANCE CALCULATIONS**

## **VARYING DESIGN SPEEDS ON 4 MILE ROAD**

# ISD CALCULATIONS (TWSC)

Performed by: TADI - TSC Date: 8/25/2022  
 Intersection: 4 Mile Road & East Driveway  
 Community: Caledonia, Racine County, WI

Mainline Name: 4 Mile Road  
 Sidestreet Name: East Site Driveway

Left-In Allowed?	Yes	P-vehicle Design Length:	19.0	feet (P = 19.0. Overwrite if other design veh)	
Left-Out Allowed?	Yes	SU-vehicle Design Length:	39.5	feet (SU-40 = 39.5. Overwrite if other design veh)	
Right-In Allowed?	Yes	WB-vehicle Design Length:	73.5	feet (WB-67 = 73.5. Overwrite if other design veh)	
Right-Out Allowed?	Yes				
Through-Out Allowed?	No				
Design Speed from Left:	30	Design Vehicles:	P	SU	WB
Design Speed from Right:	30		x	x	X
Median Width:	0		(place an "X")		
Minor Street Approach Grade:	0.0%				
Number of Near Side Right & Bike:	0.00				
Number of Near Side Thru:	1.00				
Number of Far Side Thru:	1.00				
Number of Far Side Right & Bike:	0.00				
AASHTO or WisDOT:	AASHTO				

## ISD CASE B1: Left Turn from Minor Street or Median (driver looking right)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	7.50	9.50	11.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	7.50	9.50	11.50
Case B1 ISD, feet:	330.0	418.0	506.0
Rounded Case B1 ISD, feet:	335	420	510

## ISD CASE B2: Right Turn from Minor Street (driver looking left)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	6.50	8.50	10.50
Case B2 ISD, feet:	286.0	374.0	462.0
Rounded Case B2 ISD, feet:	290	375	465

## ISD CASE B3a: Crossing from Minor Street Traffic from Left (driver looking left)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	6.50	8.50	10.50
Case B3a ISD, feet:	286.0	374.0	462.0
Rounded Case B3a ISD, feet:	290	375	465

## ISD CASE B3b: Crossing from Minor Street or Median (driver looking right)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50
Additional Time Gap 1, sec:	-6.50	-8.50	-10.50
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	0.00	0.00	0.00
Case B3b ISD, feet:	0.0	0.0	0.0
Rounded Case B3b ISD, feet:	0	0	0

## ISD CASE F: Left from Major to Minor (driver looking to left of access towards oncoming traffic)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	5.50	6.50	7.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	N/A	N/A	N/A
Total Time Gap, sec:	5.50	6.50	7.50
Case F ISD, feet:	242.0	286.0	330.0
Rounded Case F ISD, feet:	245	290	335

## ISD CONTROLLING DISTANCES:

	AASHTO MINIMUM ISD		
	P	SU	WB
To Left of Access:	290'	375'	465'
To Right of Access:	335'	420'	510'
Left-Turn from Mainline:	245'	290'	335'

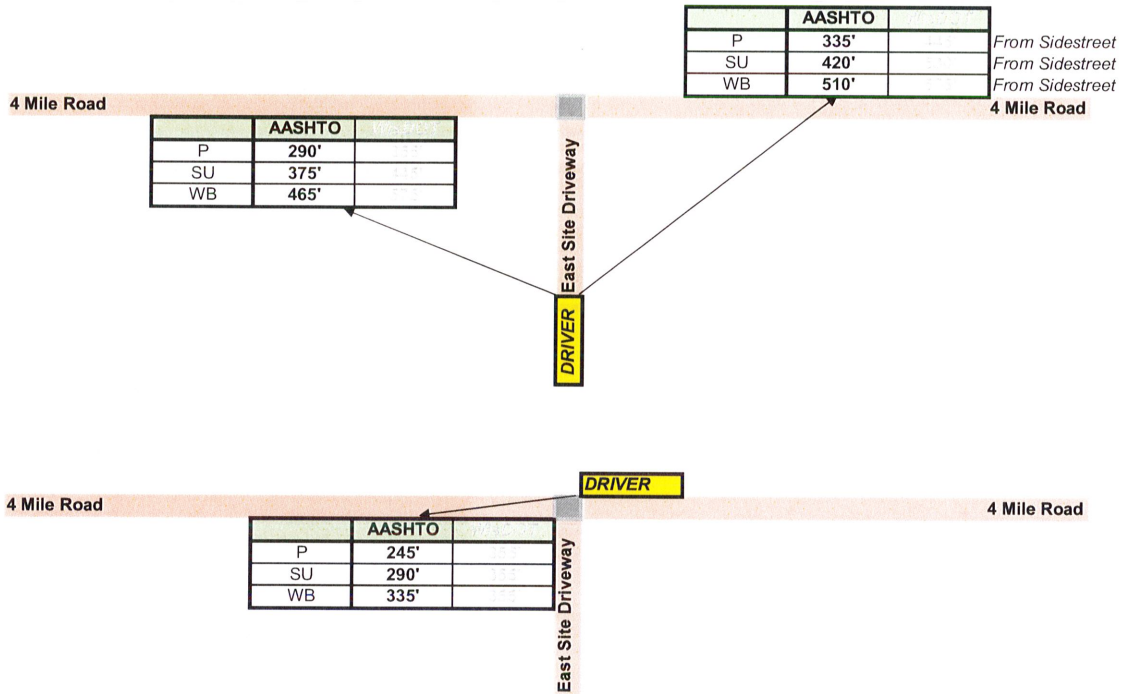
## ISD CALCULATIONS (TWSC)

Performed by: TADI - TSC Date: 8/25/2022  
 Intersection: 4 Mile Road & East Driveway  
 Community: Caledonia, Racine County, WI

Eye Height (start of Arrows): 3.5-ft for P, 7.6-ft for SU & WB  
 Object Height (head of Arrows): 3.5-ft  
 Eye Location: 14.5-ft from edge of traveled way

North

### Special Instructions



## SSD CALCULATIONS

	<u>EB</u>	<u>WB</u>	<u>NB</u>	<u>SB</u>
Design Speed:	30	30		
Deceleration (ft/s <sup>2</sup> ):	11.2	11.2		
Estimated Grade (%):	0.0%	0.0%		
Brake Reaction Time (s):	2.5	2.5		
Brake Reaction (ft):	110.0	110.0		
Braking Distance (ft):	86.3	86.3		
Calculated SSD (ft):	196.3	196.3		
Rounded SSD (ft):	200	200		

Default rate is 11.2 ft/s<sup>2</sup> per AASHTO GDHS  
 Positive is uphill, negative is downhill  
 Default rate is 2.5s per AASHTO GDHS

Eye Height (upstream of object to be seen): 3.5-ft  
 Object Height (downstream of motorist): 2.0-ft

### Special Instructions

# ISD CALCULATIONS (TWSC)

Performed by: TADI - TSC Date: 8/25/2022  
 Intersection: 4 Mile Road & East Driveway  
 Community: Caledonia, Racine County, WI

Mainline Name: 4 Mile Road  
 Sidestreet Name: East Site Driveway

Left-In Allowed?	Yes	P-vehicle Design Length:	19.0	feet (P = 19.0. Overwrite if other design veh)	
Left-Out Allowed?	Yes	SU-vehicle Design Length:	39.5	feet (SU-40 = 39.5. Overwrite if other design veh)	
Right-In Allowed?	Yes	WB-vehicle Design Length:	73.5	feet (WB-67 = 73.5. Overwrite if other design veh)	
Right-Out Allowed?	Yes				
Through-Out Allowed?	No				
Design Speed from Left:	35	Design Vehicles:	P	SU	WB
Design Speed from Right:	35		x	x	X
Median Width:	0				(place an "X")
Minor Street Approach Grade:	0.0%				
Number of Near Side Right & Bike:	0.00				
Number of Near Side Thru:	1.00				
Number of Far Side Thru:	1.00				
Number of Far Side Right & Bike:	0.00				
AASHTO or WisDOT:	AASHTO				

## ISD CASE B1: Left Turn from Minor Street or Median (driver looking right)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	7.50	9.50	11.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	7.50	9.50	11.50
Case B1 ISD, feet:	385.0	487.7	590.3
Rounded Case B1 ISD, feet:	385	490	595

## ISD CASE B2: Right Turn from Minor Street (driver looking left)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	6.50	8.50	10.50
Case B2 ISD, feet:	333.7	436.3	539.0
Rounded Case B2 ISD, feet:	335	440	540

## ISD CASE B3a: Crossing from Minor Street Traffic from Left (driver looking left)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	6.50	8.50	10.50
Case B3a ISD, feet:	333.7	436.3	539.0
Rounded Case B3a ISD, feet:	335	440	540

## ISD CASE B3b: Crossing from Minor Street or Median (driver looking right)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50
Additional Time Gap 1, sec:	-6.50	-8.50	-10.50
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	0.00	0.00	0.00
Case B3b ISD, feet:	0.0	0.0	0.0
Rounded Case B3b ISD, feet:	0	0	0

## ISD CASE F: Left from Major to Minor (driver looking to left of access towards oncoming traffic)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	5.50	6.50	7.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	N/A	N/A	N/A
Total Time Gap, sec:	5.50	6.50	7.50
Case F ISD, feet:	282.3	333.7	385.0
Rounded Case F ISD, feet:	285	335	385

## ISD CONTROLLING DISTANCES:

	AASHTO MINIMUM ISD		
	P	SU	WB
To Left of Access:	335'	440'	540'
To Right of Access:	385'	490'	595'
Left-Turn from Mainline:	285'	335'	385'



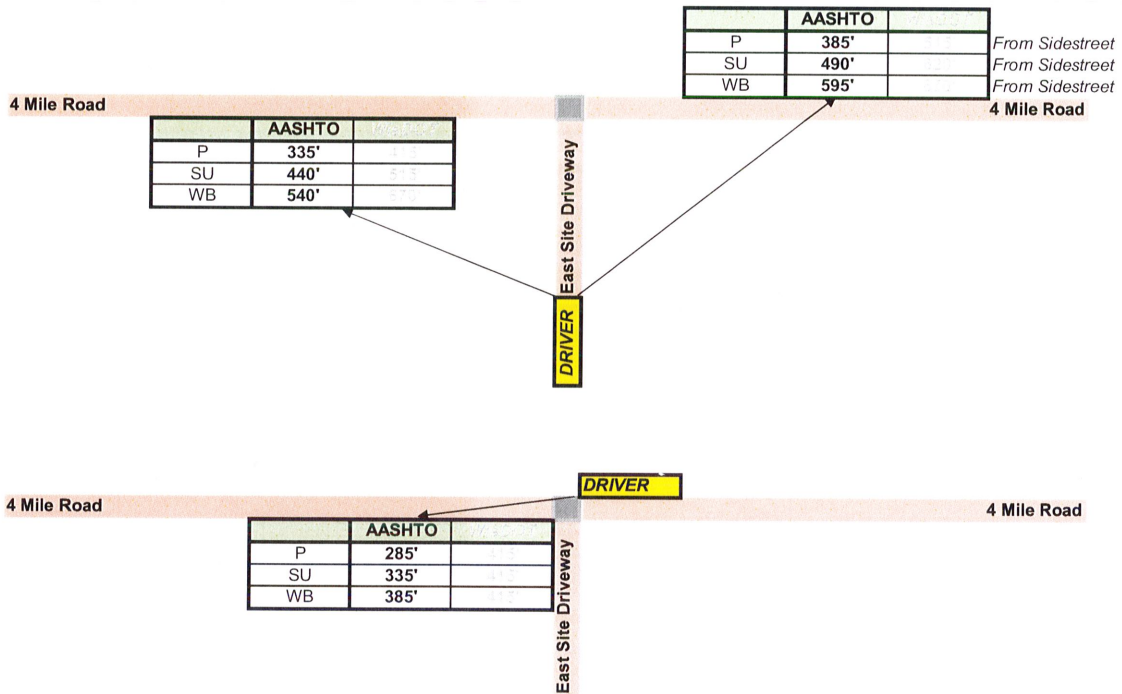
## ISD CALCULATIONS (TWSC)

Performed by: TADI - TSC Date: 8/25/2022  
 Intersection: 4 Mile Road & East Driveway  
 Community: Caledonia, Racine County, WI

Eye Height (start of Arrows): 3.5-ft for P, 7.6-ft for SU & WB  
 Object Height (head of Arrows): 3.5-ft  
 Eye Location: 14.5-ft from edge of traveled way

North

### Special Instructions



## SSD CALCULATIONS

	EB	WB	NB	SB
Design Speed:	35	35		
Deceleration (ft/s <sup>2</sup> ):	11.2	11.2		
Estimated Grade (%):	0.0%	0.0%		
Brake Reaction Time (s):	2.5	2.5		
Brake Reaction (ft):	128.3	128.3		
Braking Distance (ft):	117.4	117.4		
Calculated SSD (ft):	245.7	245.7		
Rounded SSD (ft):	250	250		

Default rate is 11.2 ft/s<sup>2</sup> per AASHTO GDHS  
 Positive is uphill, negative is downhill  
 Default rate is 2.5s per AASHTO GDHS

Eye Height (upstream of object to be seen): 3.5-ft  
 Object Height (downstream of motorist): 2.0-ft

### Special Instructions

# ISD CALCULATIONS (TWSC)

Performed by: TADI - TSC Date: 8/25/2022  
 Intersection: 4 Mile Road & East Driveway  
 Community: Caledonia, Racine County, WI

Mainline Name: 4 Mile Road  
 Sidestreet Name: East Site Driveway

Left-In Allowed?	Yes	P-vehicle Design Length:	19.0	feet (P = 19.0. Overwrite if other design veh)	
Left-Out Allowed?	Yes	SU-vehicle Design Length:	39.5	feet (SU-40 = 39.5. Overwrite if other design veh)	
Right-In Allowed?	Yes	WB-vehicle Design Length:	73.5	feet (WB-67 = 73.5. Overwrite if other design veh)	
Right-Out Allowed?	Yes				
Through-Out Allowed?	No				
Design Speed from Left:	40	Design Vehicles:	P	SU	WB
Design Speed from Right:	40		x	x	X
Median Width:	0		(place an "X")		
Minor Street Approach Grade:	0.0%				
Number of Near Side Right & Bike:	0.00				
Number of Near Side Thru:	1.00				
Number of Far Side Thru:	1.00				
Number of Far Side Right & Bike:	0.00				
AASHTO or WisDOT:	AASHTO				

## ISD CASE B1: Left Turn from Minor Street or Median (driver looking right)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	7.50	9.50	11.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	7.50	9.50	11.50
Case B1 ISD, feet:	440.0	557.3	674.7
Rounded Case B1 ISD, feet:	445	560	675

## ISD CASE B2: Right Turn from Minor Street (driver looking left)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	6.50	8.50	10.50
Case B2 ISD, feet:	381.3	498.7	616.0
Rounded Case B2 ISD, feet:	385	500	620

## ISD CASE B3a: Crossing from Minor Street Traffic from Left (driver looking left)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	6.50	8.50	10.50
Case B3a ISD, feet:	381.3	498.7	616.0
Rounded Case B3a ISD, feet:	385	500	620

## ISD CASE B3b: Crossing from Minor Street or Median (driver looking right)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50
Additional Time Gap 1, sec:	-6.50	-8.50	-10.50
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	0.00	0.00	0.00
Case B3b ISD, feet:	0.0	0.0	0.0
Rounded Case B3b ISD, feet:	0	0	0

## ISD CASE F: Left from Major to Minor (driver looking to left of access towards oncoming traffic)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	5.50	6.50	7.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	N/A	N/A	N/A
Total Time Gap, sec:	5.50	6.50	7.50
Case F ISD, feet:	322.7	381.3	440.0
Rounded Case F ISD, feet:	325	385	445

## ISD CONTROLLING DISTANCES:

	AASHTO MINIMUM ISD			P	SU	WB
To Left of Access:	385'	500'	620'			
To Right of Access:	445'	560'	675'			
Left-Turn from Mainline:	325'	385'	445'			

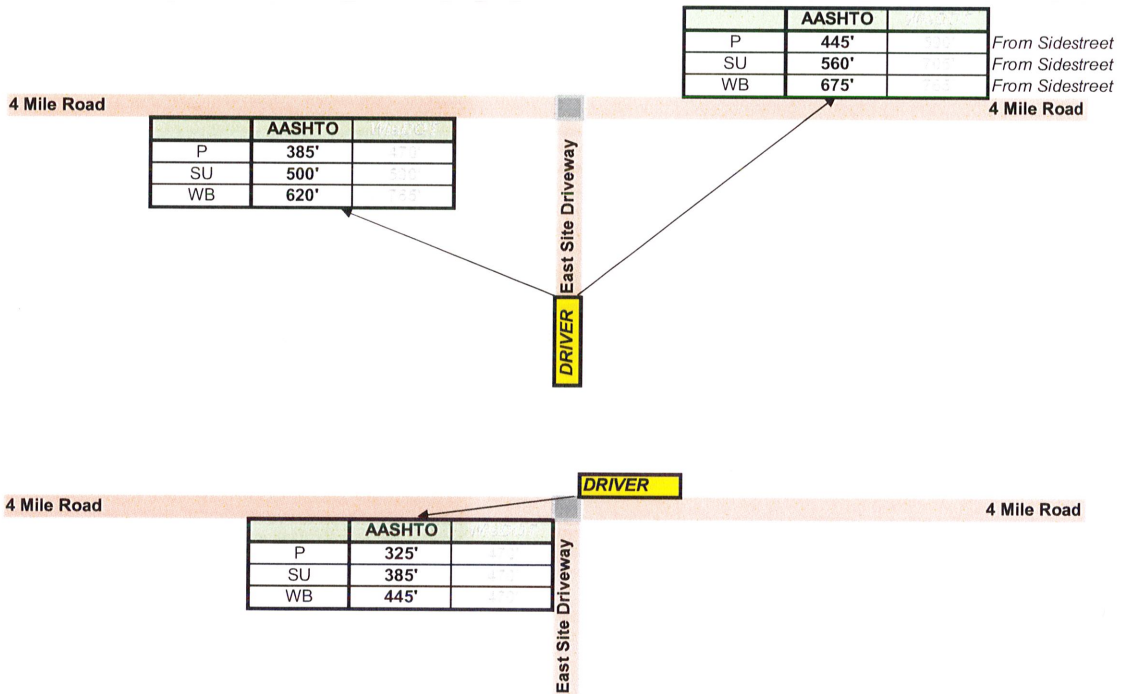
# ISD CALCULATIONS (TWSC)

Performed by: TADI - TSC Date: 8/25/2022  
 Intersection: 4 Mile Road & East Driveway  
 Community: Caledonia, Racine County, WI

Eye Height (start of Arrows): 3.5-ft for P, 7.6-ft for SU & WB  
 Object Height (head of Arrows): 3.5-ft  
 Eye Location: 14.5-ft from edge of traveled way

North

## Special Instructions



# SSD CALCULATIONS

	EB	WB	NB	SB
Design Speed:	40	40		
Deceleration (ft/s <sup>2</sup> ):	11.2	11.2		
Estimated Grade (%):	0.0%	0.0%		
Brake Reaction Time (s):	2.5	2.5		
Brake Reaction (ft):	146.7	146.7		
Braking Distance (ft):	153.3	153.3		
Calculated SSD (ft):	300.0	300.0		
Rounded SSD (ft):	305	305		

Default rate is 11.2 ft/s<sup>2</sup> per AASHTO GDHS  
 Positive is uphill, negative is downhill  
 Default rate is 2.5s per AASHTO GDHS

Eye Height (upstream of object to be seen): 3.5-ft  
 Object Height (downstream of motorist): 2.0-ft

## Special Instructions

# ISD CALCULATIONS (TWSC)

Performed by: TADI - TSC Date: 8/25/2022  
 Intersection: 4 Mile Road & East Driveway  
 Community: Caledonia, Racine County, WI

Mainline Name: 4 Mile Road  
 Sidestreet Name: East Site Driveway

Left-In Allowed?	Yes	P-vehicle Design Length:	19.0	feet (P = 19.0. Overwrite if other design veh)	
Left-Out Allowed?	Yes	SU-vehicle Design Length:	39.5	feet (SU-40 = 39.5. Overwrite if other design veh)	
Right-In Allowed?	Yes	WB-vehicle Design Length:	73.5	feet (WB-67 = 73.5. Overwrite if other design veh)	
Right-Out Allowed?	Yes				
Through-Out Allowed?	No				
Design Speed from Left:	45	Design Vehicles:	P	SU	WB
Design Speed from Right:	45		x	x	X
Median Width:	0		(place an "X")		
Minor Street Approach Grade:	0.0%				
Number of Near Side Right & Bike:	0.00				
Number of Near Side Thru:	1.00				
Number of Far Side Thru:	1.00				
Number of Far Side Right & Bike:	0.00				
AASHTO or WisDOT:	AASHTO				

## ISD CASE B1: Left Turn from Minor Street or Median (driver looking right)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	7.50	9.50	11.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	7.50	9.50	11.50
Case B1 ISD, feet:	495.0	627.0	759.0
Rounded Case B1 ISD, feet:	500	630	760

## ISD CASE B2: Right Turn from Minor Street (driver looking left)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	6.50	8.50	10.50
Case B2 ISD, feet:	429.0	561.0	693.0
Rounded Case B2 ISD, feet:	430	565	695

## ISD CASE B3a: Crossing from Minor Street Traffic from Left (driver looking left)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	6.50	8.50	10.50
Case B3a ISD, feet:	429.0	561.0	693.0
Rounded Case B3a ISD, feet:	430	565	695

## ISD CASE B3b: Crossing from Minor Street or Median (driver looking right)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50
Additional Time Gap 1, sec:	-6.50	-8.50	-10.50
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	0.00	0.00	0.00
Case B3b ISD, feet:	0.0	0.0	0.0
Rounded Case B3b ISD, feet:	0	0	0

## ISD CASE F: Left from Major to Minor (driver looking to left of access towards oncoming traffic)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	5.50	6.50	7.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	N/A	N/A	N/A
Total Time Gap, sec:	5.50	6.50	7.50
Case F ISD, feet:	363.0	429.0	495.0
Rounded Case F ISD, feet:	365	430	500

## ISD CONTROLLING DISTANCES:

	AASHTO MINIMUM ISD		
	P	SU	WB
To Left of Access:	430'	565'	695'
To Right of Access:	500'	630'	760'
Left-Turn from Mainline:	365'	430'	500'

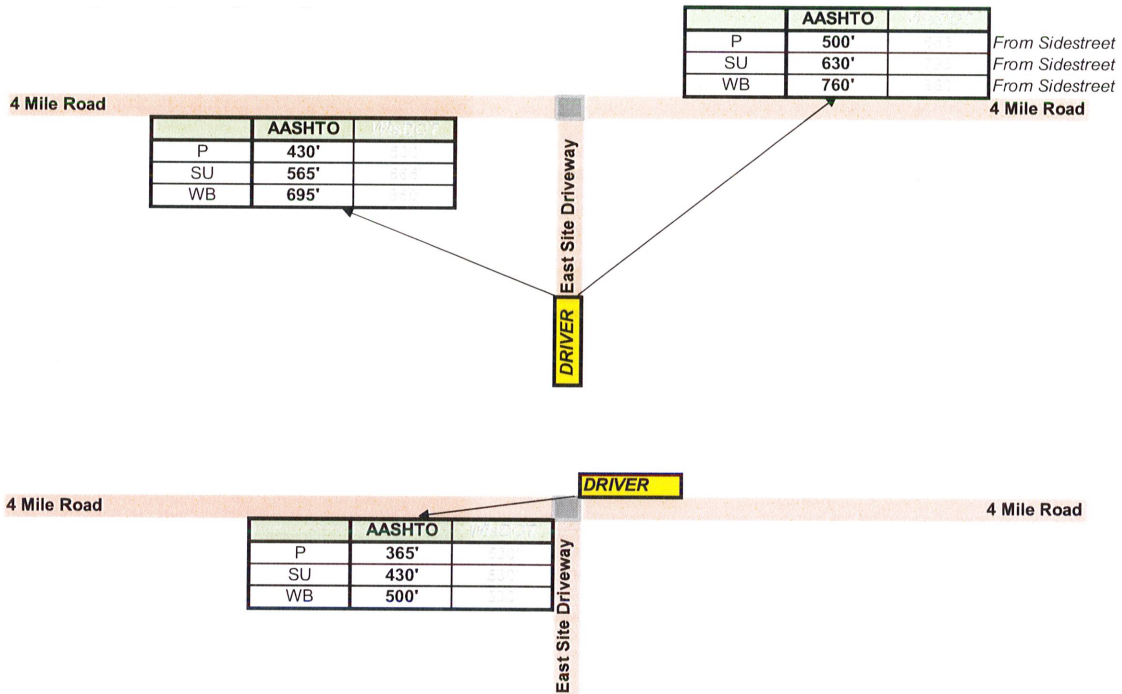
# ISD CALCULATIONS (TWSC)

Performed by: TADI - TSC Date: 8/25/2022  
 Intersection: 4 Mile Road & East Driveway  
 Community: Caledonia, Racine County, WI

North

Eye Height (start of Arrows): 3.5-ft for P, 7.6-ft for SU & WB  
 Object Height (head of Arrows): 3.5-ft  
 Eye Location: 14.5-ft from edge of traveled way

### Special Instructions



## SSD CALCULATIONS

	EB	WB	NB	SB
Design Speed:	45	45		
Deceleration (ft/s <sup>2</sup> ):	11.2	11.2		
Estimated Grade (%):	0.0%	0.0%		
Brake Reaction Time (s):	2.5	2.5		
Brake Reaction (ft):	165.0	165.0		
Braking Distance (ft):	194.1	194.1		
Calculated SSD (ft):	359.1	359.1		
Rounded SSD (ft):	360	360		

Default rate is 11.2 ft/s<sup>2</sup> per AASHTO GDHS  
 Positive is uphill, negative is downhill  
 Default rate is 2.5s per AASHTO GDHS

Eye Height (upstream of object to be seen): 3.5-ft  
 Object Height (downstream of motorist): 2.0-ft

### Special Instructions

# ISD CALCULATIONS (TWSC)

Performed by: TADI - TSC Date: 8/25/2022  
 Intersection: 4 Mile Road & East Driveway  
 Community: Caledonia, Racine County, WI

Mainline Name: 4 Mile Road  
 Sidestreet Name: East Site Driveway

Left-In Allowed?	<b>Yes</b>	P-vehicle Design Length:	<b>19.0</b>	feet (P = 19.0. Overwrite if other design veh)						
Left-Out Allowed?	<b>Yes</b>	SU-vehicle Design Length:	<b>39.5</b>	feet (SU-40 = 39.5. Overwrite if other design veh)						
Right-In Allowed?	<b>Yes</b>	WB-vehicle Design Length:	<b>73.5</b>	feet (WB-67 = 73.5. Overwrite if other design veh)						
Right-Out Allowed?	<b>Yes</b>									
Through-Out Allowed?	<b>No</b>									
Design Speed from Left:	<b>50</b> mph									
Design Speed from Right:	<b>50</b> mph	Design Vehicles:	<table border="1"><tr><td>P</td><td>SU</td><td>WB</td></tr><tr><td>x</td><td>x</td><td>X</td></tr></table>	P	SU	WB	x	x	X	(place an "X")
P	SU	WB								
x	x	X								
Median Width:	<b>0</b> feet									
Minor Street Approach Grade:	<b>0.0%</b>			If a minor street vehicle approaches the major street at greater than 3%, enter grade.						
Number of Near Side Right & Bike:	<b>0.00</b>			equivalent 12-ft lanes. Include tapers, auxiliary lanes, parking lanes, and bicycle accommodations.						
Number of Near Side Thru:	<b>1.00</b>			equivalent 12-ft lanes.						
Number of Far Side Thru:	<b>1.00</b>			equivalent 12-ft lanes.						
Number of Far Side Right & Bike:	<b>0.00</b>			equivalent 12-ft lanes. Include tapers, auxiliary lanes, parking lanes, and bicycle accommodations.						
AASHTO or WisDOT:	<b>AASHTO</b>									

## ISD CASE B1: Left Turn from Minor Street or Median (driver looking right)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	7.50	9.50	11.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	7.50	9.50	11.50
Case B1 ISD, feet:	550.0	696.7	843.3
Rounded Case B1 ISD, feet:	555	700	845

## ISD CASE B2: Right Turn from Minor Street (driver looking left)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	6.50	8.50	10.50
Case B2 ISD, feet:	476.7	623.3	770.0
Rounded Case B2 ISD, feet:	480	625	775

## ISD CASE B3a: Crossing from Minor Street Traffic from Left (driver looking left)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	6.50	8.50	10.50
Case B3a ISD, feet:	476.7	623.3	770.0
Rounded Case B3a ISD, feet:	480	625	775

## ISD CASE B3b: Crossing from Minor Street or Median (driver looking right)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	6.50	8.50	10.50
Additional Time Gap 1, sec:	-6.50	-8.50	-10.50
Additional Time Gap 2, sec:	0.00	0.00	0.00
Total Time Gap, sec:	0.00	0.00	0.00
Case B3b ISD, feet:	0.0	0.0	0.0
Rounded Case B3b ISD, feet:	0	0	0

## ISD CASE F: Left from Major to Minor (driver looking to left of access towards oncoming traffic)

	AASHTO MINIMUM ISD		
	P	SU	WB
Base Time Gap, sec:	5.50	6.50	7.50
Additional Time Gap 1, sec:	0.00	0.00	0.00
Additional Time Gap 2, sec:	N/A	N/A	N/A
Total Time Gap, sec:	5.50	6.50	7.50
Case F ISD, feet:	403.3	476.7	550.0
Rounded Case F ISD, feet:	405	480	555

## ISD CONTROLLING DISTANCES:

	AASHTO MINIMUM ISD		
	P	SU	WB
To Left of Access:	480'	625'	775'
To Right of Access:	555'	700'	845'
Left-Turn from Mainline:	405'	480'	555'

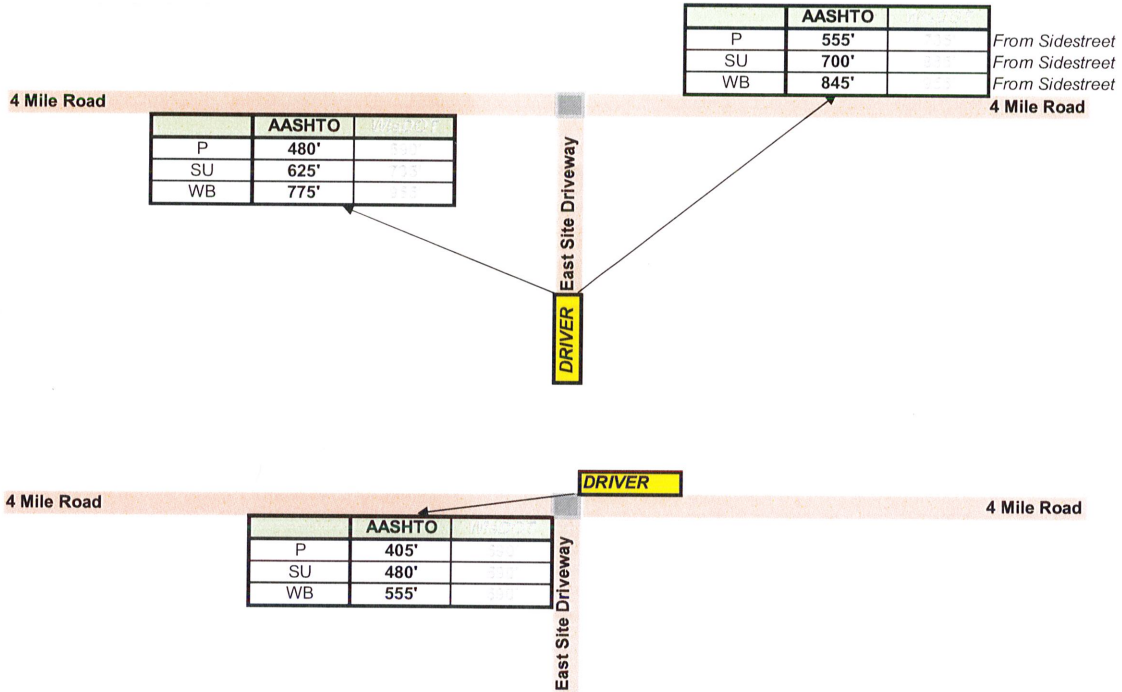
# ISD CALCULATIONS (TWSC)

Performed by: TADI - TSC Date: 8/25/2022  
 Intersection: 4 Mile Road & East Driveway  
 Community: Caledonia, Racine County, WI

North

Eye Height (start of Arrows): 3.5-ft for P, 7.6-ft for SU & WB  
 Object Height (head of Arrows): 3.5-ft  
 Eye Location: 14.5-ft from edge of traveled way

### Special Instructions



## SSD CALCULATIONS

	EB	WB	NB	SB
Design Speed:	50	50		
Deceleration (ft/s <sup>2</sup> ):	11.2	11.2		
Estimated Grade (%):	0.0%	0.0%		
Brake Reaction Time (s):	2.5	2.5		
Brake Reaction (ft):	183.3	183.3		
Braking Distance (ft):	239.6	239.6		
Calculated SSD (ft):	422.9	422.9		
<b>Rounded SSD (ft):</b>	<b>425</b>	<b>425</b>		

Default rate is 11.2 ft/s<sup>2</sup> per AASHTO GDHS  
 Positive is uphill, negative is downhill  
 Default rate is 2.5s per AASHTO GDHS

Eye Height (upstream of object to be seen): 3.5-ft  
 Object Height (downstream of motorist): 2.0-ft

### Special Instructions