Dexter-Chelsea & Freer Road Safety Audit

Final Report

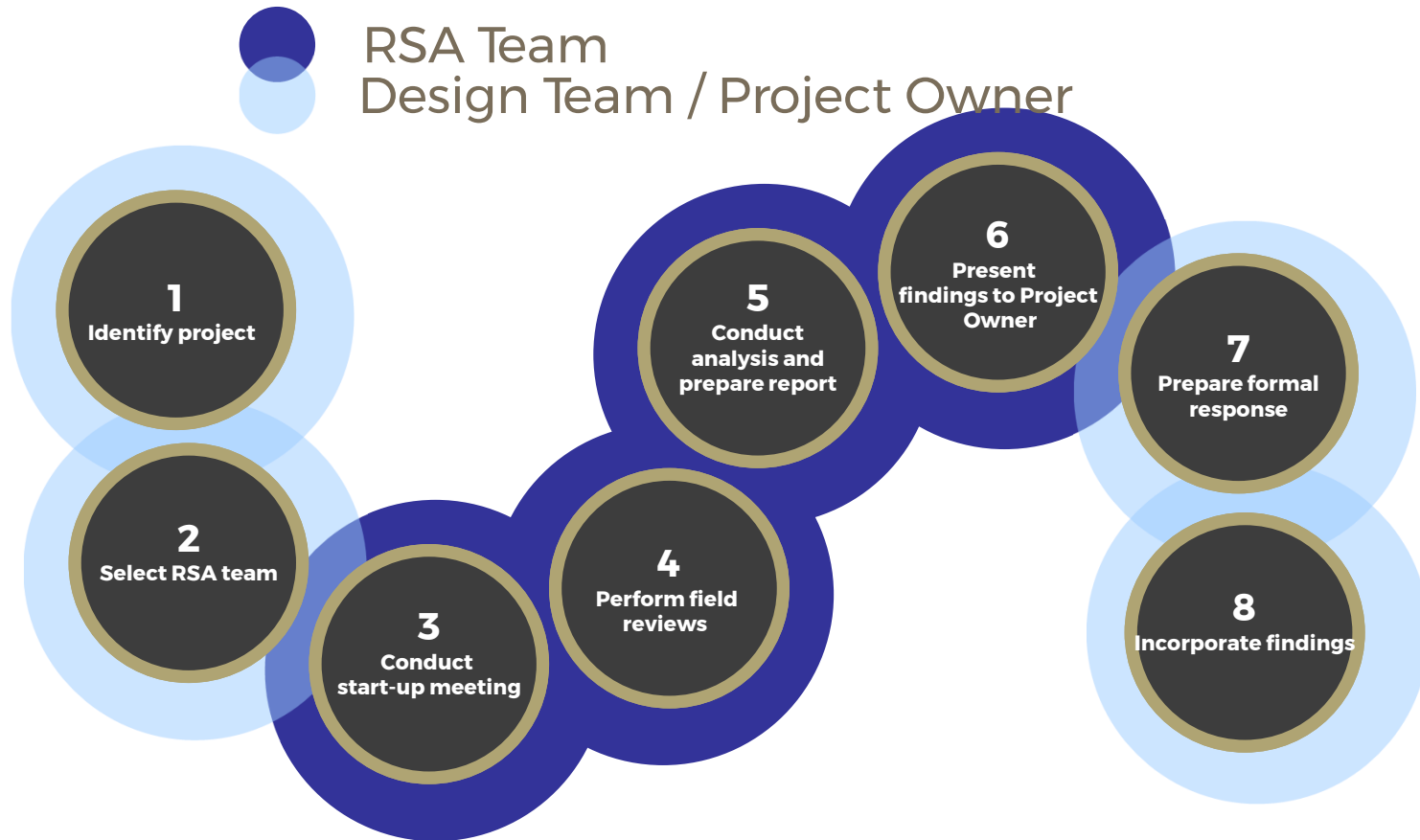RSA
Making Your Roads Safer

February 4, 2019

RSA Definition

A **formal safety performance examination** of an **existing or future road** or intersection by an **independent, multi-disciplinary RSA team**.

RSA Steps

RSA Team
Design Team / Project Owner

1 Identify project

2 Select RSA team

3 Conduct start-up meeting

4 Perform field reviews

5 Conduct analysis and prepare report

6 Present findings to Project Owner

7 Prepare formal response

8 Incorporate findings

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Our RSA Team

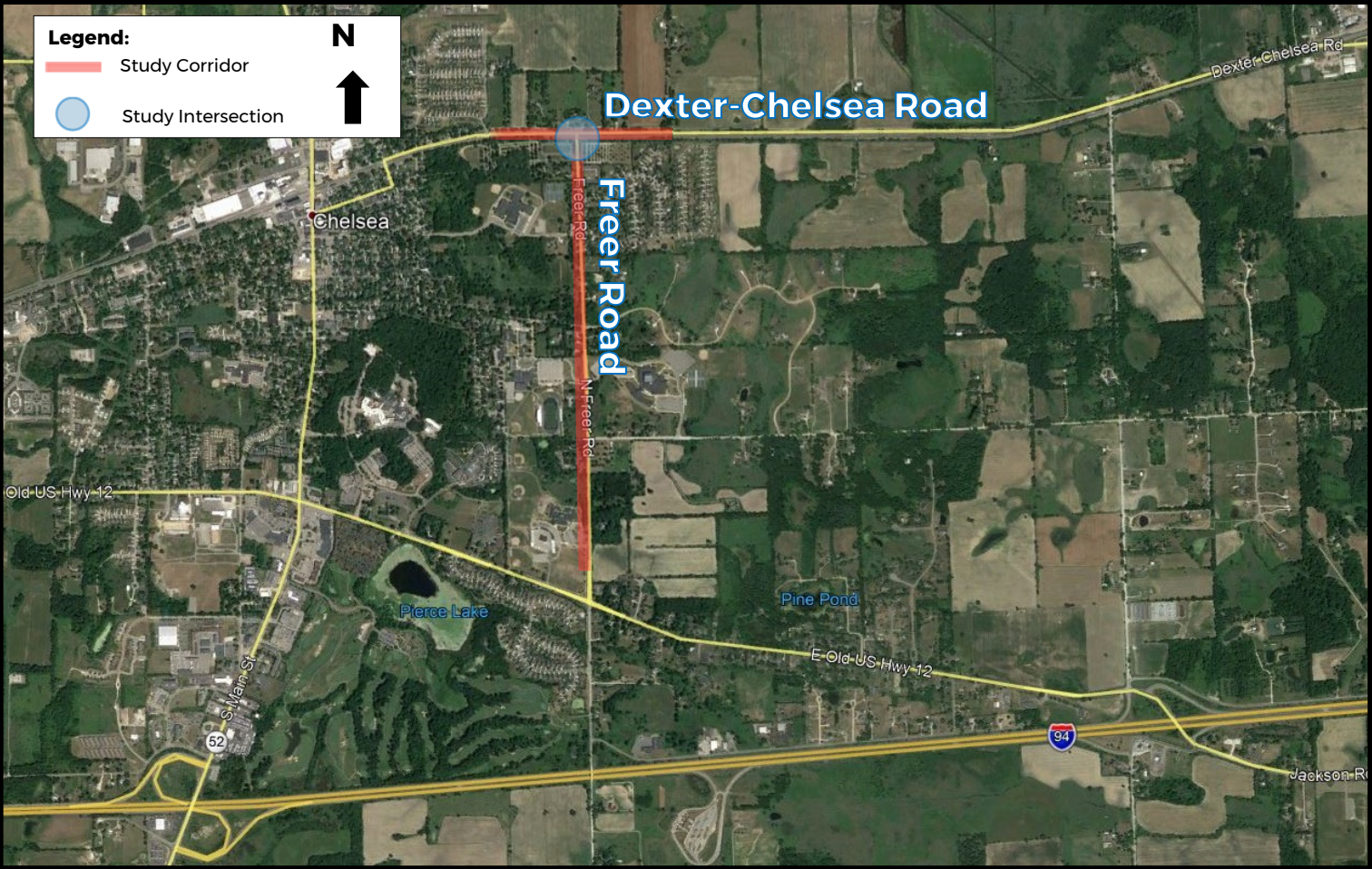|		
— Andrew Ceifetz, P.E.	Team Leader	WSP
— Matthew Hill, P.E., PTOE	Operations	WSP
— Joyce Yassin, P.E., PTOE	Safety	WSP
— Patrick Eldridge, P.E.	Transportation	WSP

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Field Review

— Field Review
  — *September 5th, 2018*
  — *November 26-27th & 29th, 2018*

— Kick-off & Preliminary Presentation Attendees
  — *City of Chelsea*
  — *Chelsea School District (Admin. & Transportation)*
  — *City of Chelsea Public Safety*
  — *Michigan Department of Transportation – University*
  — *Washtenaw Area Transportation Study (WATS)*
  — *WSP*

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Project Location

Materials

— Traffic Counts

— Preliminary Construction Sheets (Border to Border Trail)

— Planned & Anticipated Residential Developments

— Crash Reports (One-Lines & UD-10's)

— Mapped Crash Locations

— Chelsea Transportation Working Group Presentation

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Existing Safety Benefits

— Intersection Lighting

— Wayfinding Signs

— Planned Pedestrian / Bicyclist Facility

— Deer Crossing Warning Signs

— Visible School Crossing

Site Observations

— Close proximity to high speed railroad crossing

— Narrow shoulders / clear zone

— Pedestrian and bicycle traffic / lack of non-motorized facilities

— Functional lighting in study area

Estimating Risk

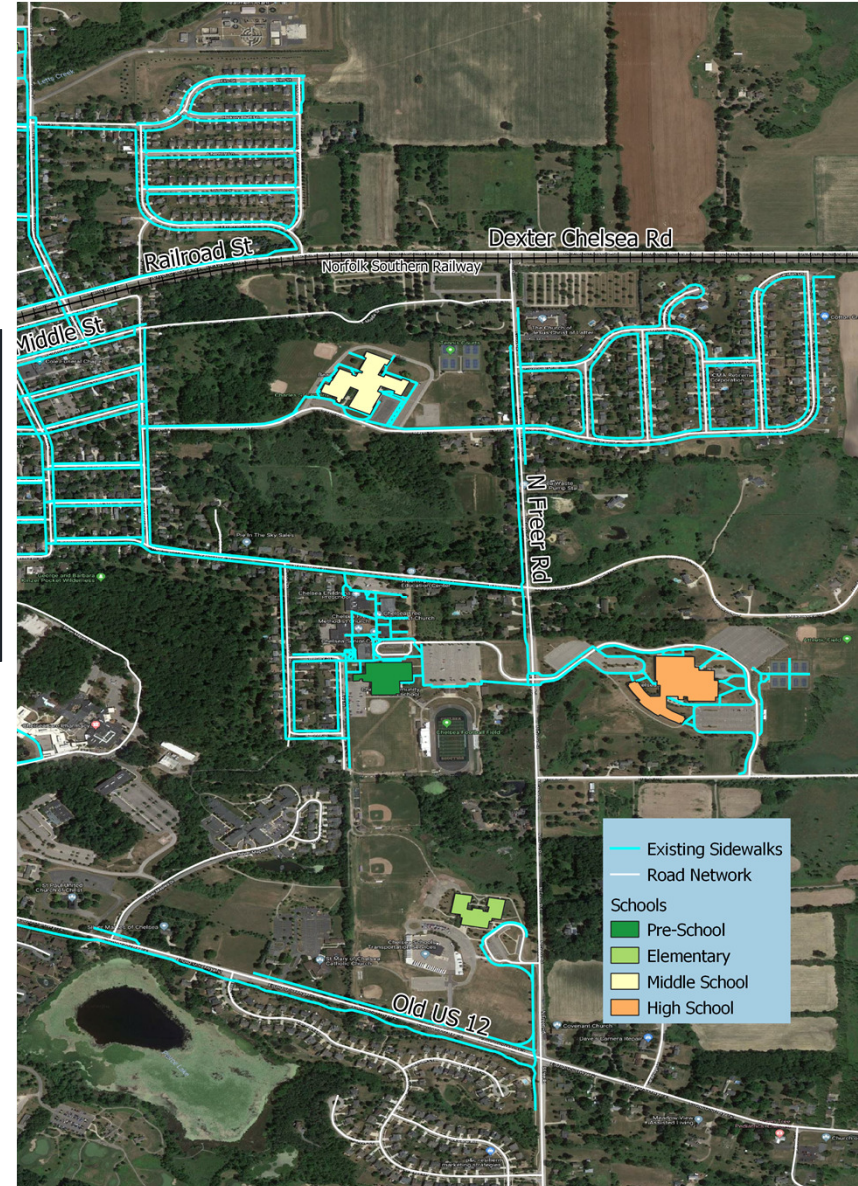| Crash Frequency	Crash Severity			
	Negligible	*Low*	*Moderate*	*High*
Frequent	C	D	E	F
Occasional	B	C	D	E
Rare	A	B	C	D

Risk Category
F = Highest Priority
A = Lowest Priority

Safety Issue #1 Discontiguous Non-motorized Facilities

Crash Frequency	Crash Severity			
	Negligible	Low	Moderate	High
Frequent	C	D	E	F
Occasional	B	C	D	E
Rare	A	B	C	D
Expected Crash Types	Pedestrian & Bicycle Involved			

Legend:
- Existing Sidewalks
- Road Network
- Schools
  - Pre-School
  - Elementary
  - Middle School
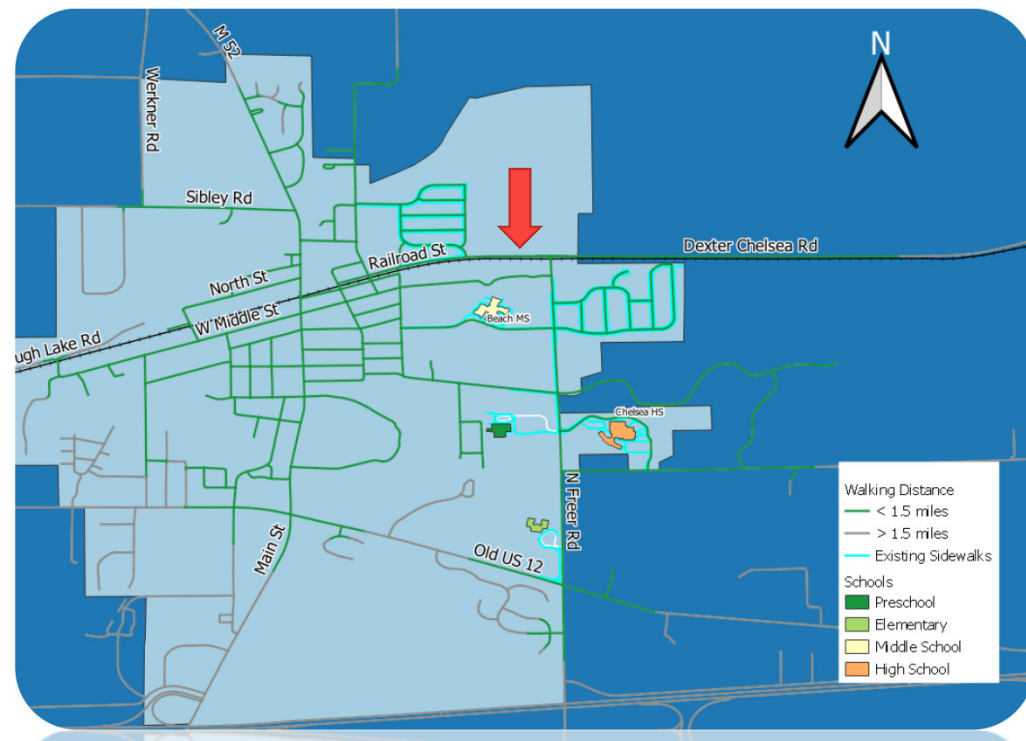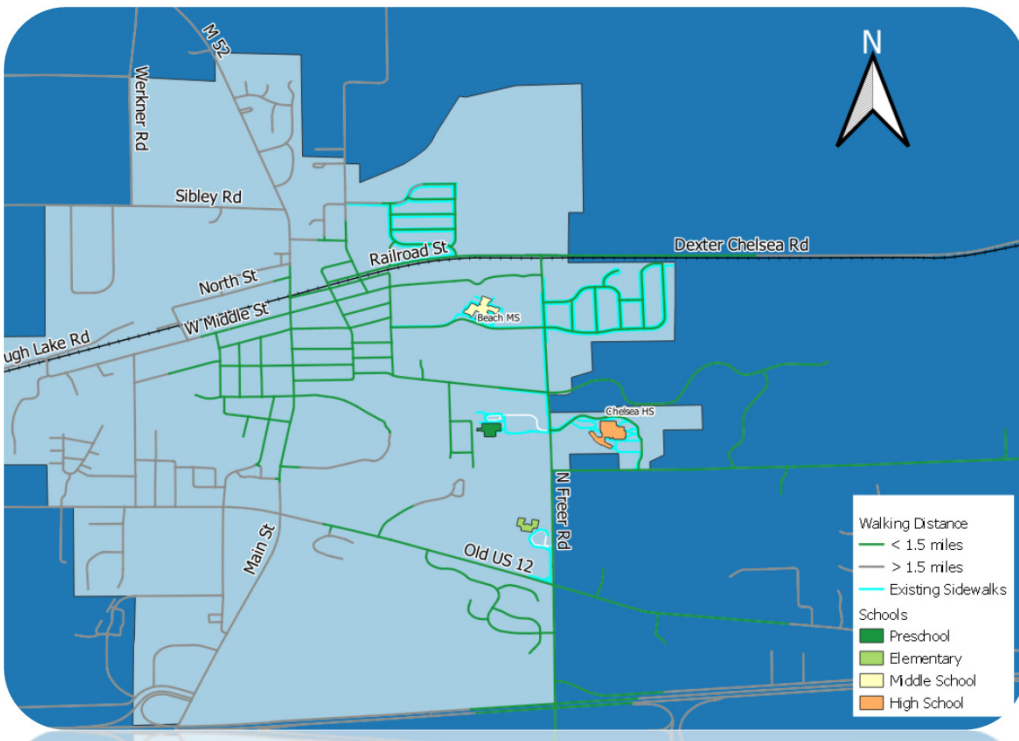 - High School

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Safety Issue #1 – Recommendations

— Improve sidewalk connectivity

  — Install Sidewalk on North Side of Dexter-Chelsea Road

  — Connect gaps along Freer utilizing existing facilities

— Consider sharrows or bike lane on Freer Road

— Wayfinding signing for non-motorized facilities

Safety Issue #1 – Recommendations

— Improve Sidewalk Connectivity

— Install Sidewalk on North Side of Dexter-Chelsea Road

Range increases with pedestrian crossing & filling in sidewalk gap along Dexter-Chelsea
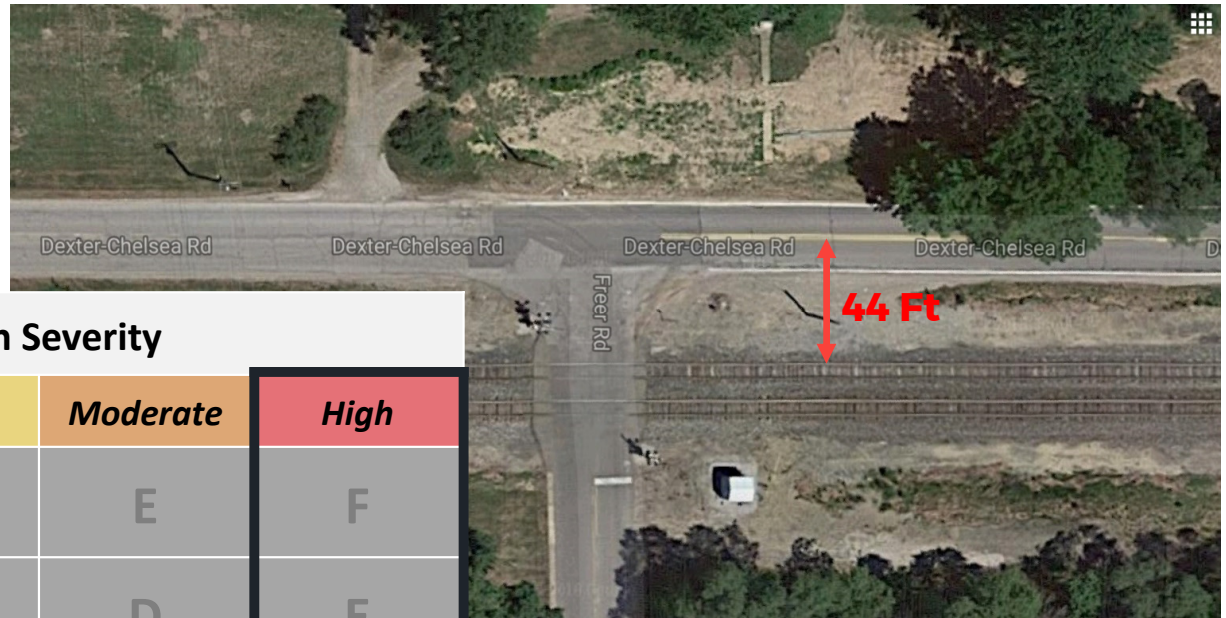
Safety Issue #2 Lack of Lane Delineation

Crash Frequency	Crash Severity			
	Negligible	Low	Moderate	High
Frequent	C	D	E	**F**
Occasional	B	C	D	**E**
Rare	A	B	C	D
Expected Crash Types	Single Motor Vehicle & Sideswipe Opposite			

Safety Issue #2 – Recommendations

— Refresh or Install edge/centerline pavement markings

— Improve Lane Delineation

— Recessed markings

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Safety Issue #3 Poor Spacing between Railroad Tracks and Dexter-Chelsea Road

Crash Frequency	Crash Severity			
	Negligible	*Low*	*Moderate*	*High*
Frequent	C	D	E	F
Occasional	B	C	D	E
Rare	A	B	C	**D**

Expected Crash Types	Train Involved & Angle

Safety Issue #3 – Recommendations

— Relocate Intersection of Dexter-Chelsea & Freer Rd

— Add "Do Not Stop on Tracks" Signage

— Relocate or Resize Railroad Equipment Shed

— Install Intersection Collision Warning System

Source: cts.umn.edu

DO NOT STOP ON TRACKS

Safety Issue #3 – Recommendations

- Consider Traffic Signal with pre-signal actuation on Freer Road
- Increase advanced warning time for railroad crossing signal

Safety Issue #4 High Speed Variability

Crash Frequency	Crash Severity			
	Negligible	Low	Moderate	High
Frequent	C	D	E	F
Occasional	B	**C**	**D**	E
Rare	A	B	C	D

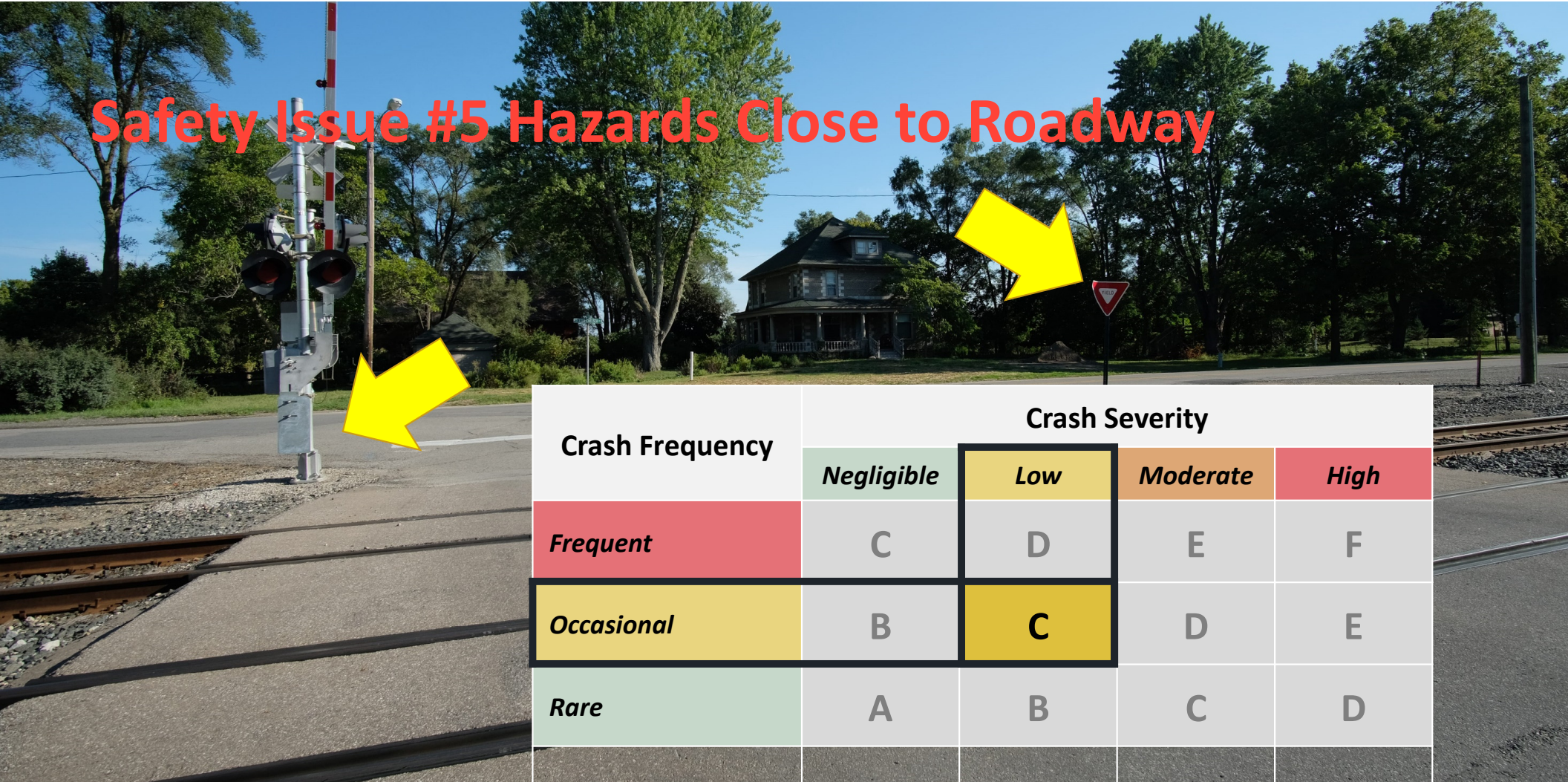| Expected Crash Types	Angle & Rear End

Safety Issue #4 – Recommendations

Relocate the speed transition further to the east on Dexter-Chelsea Road

Safety Issue #5 Hazards Close to Roadway

Crash Frequency	Crash Severity			
	Negligible	*Low*	*Moderate*	*High*
Frequent	C	D	E	F
Occasional	B	**C**	D	E
Rare	A	B	C	D
Expected Crash Types	Single Motor Vehicle			

Safety Issue #5 – Recommendations

— Install Intersection Curb
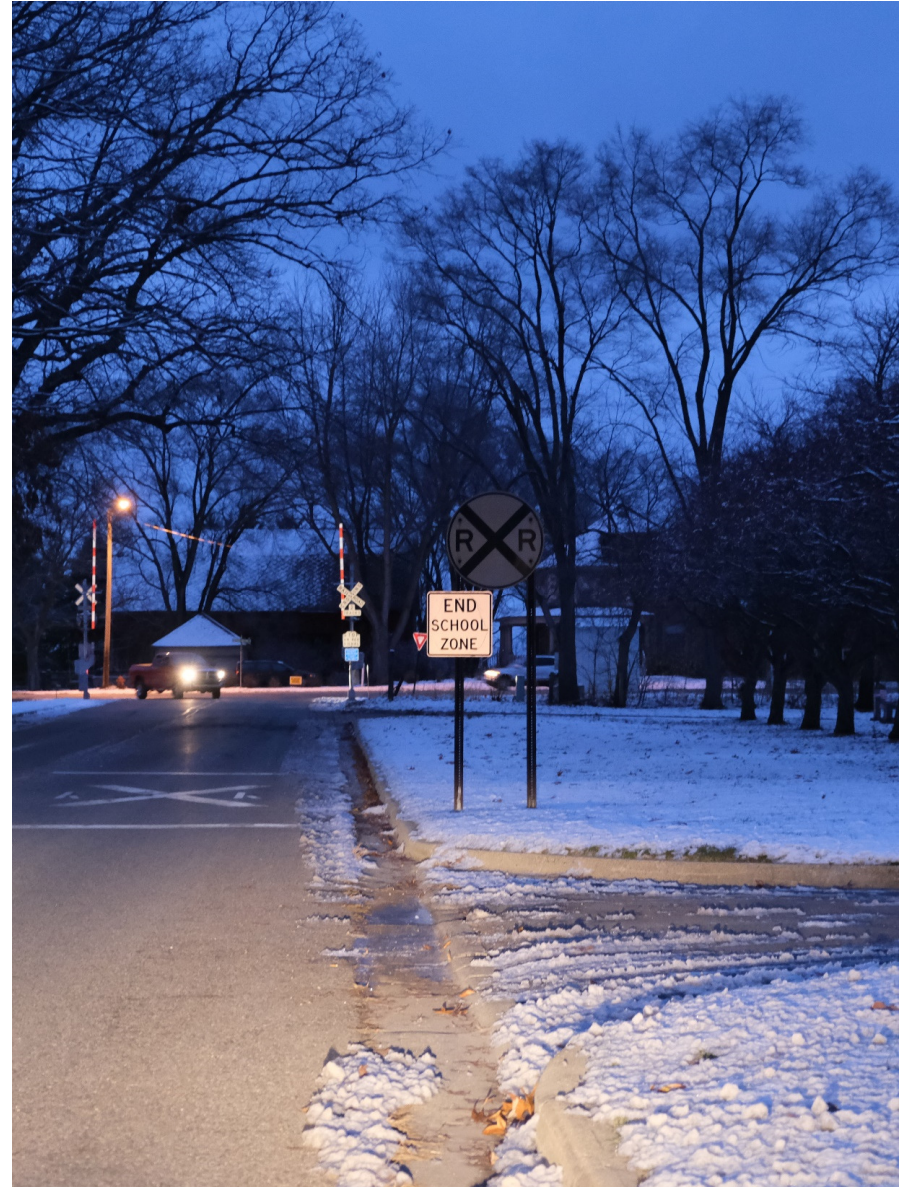
— Relocate Hazards Where Possible

Other Concerns

— Poor Pavement Conditions

— Poor Intersection Conspicuity

Other Concerns

Poor Sign Retro Reflectivity

Other Recommendations

— Improve Pavement Conditions

— Improve Lighting along corridor

— Two-Direction Large Arrow Sign (WI-7)

— Oversize Existing Street Name Signs

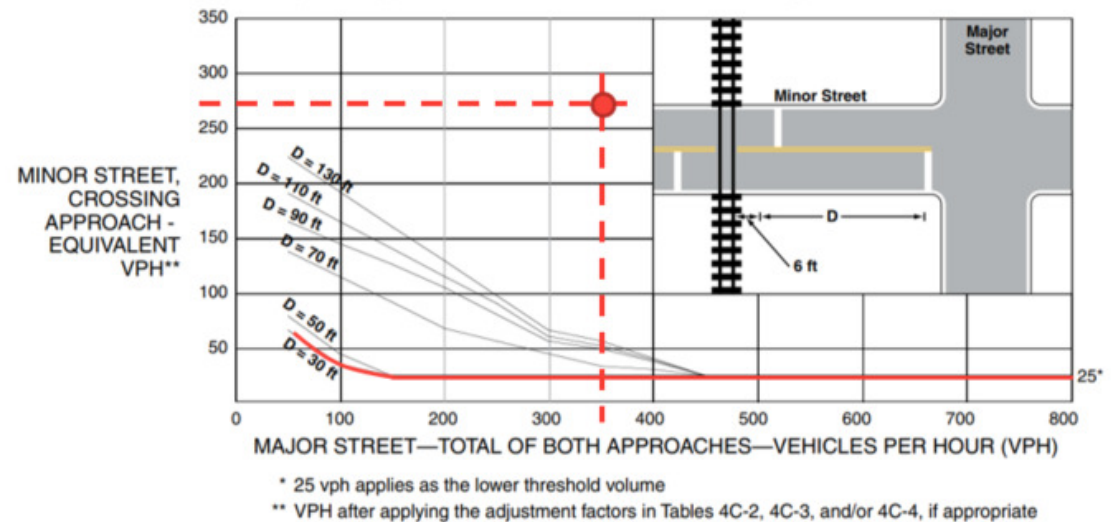— Install Advanced Street Name Signs

W1-7

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Highway Safety Manual Analysis

— "...a science-based technical approach to incorporating safety into traditional roadway planning and safety analyses..."

— Current version most suited to assess impacts of motor-vehicle focused treatments, limiting its applicability in this scenario

— Urban & Suburban Intersections

  — Decrease in Fatal & Serious Injury with a slight increase the Property Damage Only at Dexter-Chelsea and Freer Roads

— Urban & Suburban Segments

  — Reduction in crashes along southern leg of Freer Rd
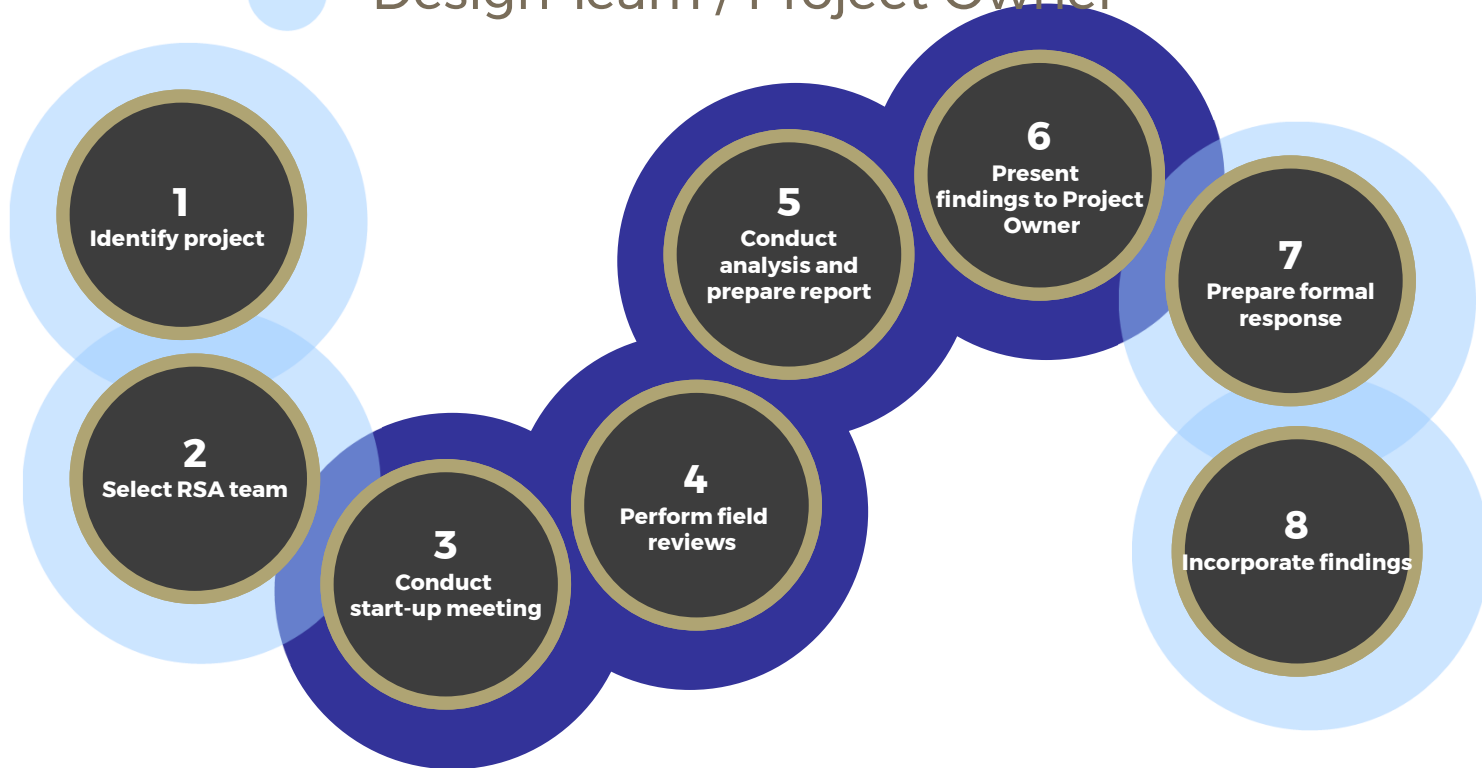
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Synchro Analysis

— Any signal design would require additional detail and current traffic counts, but preliminary analysis suggests this locations satisfies the MMUTCD Signal Warrant 9 – Intersection at a Near Grade Crossing.

— Installation of an actuated traffic signal with preemption for the railroad crossing would maintain similar Level of Service for drivers including projected increases in traffic from upcoming residential developments.

Figure 4C-9. Warrant 9, Intersection Near a Grade Crossing (One Approach Lane at the Track Crossing)

MINOR STREET, CROSSING APPROACH - EQUIVALENT VPH**

D = 130 ft
D = 110 ft
D = 90 ft
D = 70 ft
D = 50 ft
D = 30 ft

MAJOR STREET—TOTAL OF BOTH APPROACHES—VEHICLES PER HOUR (VPH)

* 25 vph applies as the lower threshold volume
** VPH after applying the adjustment factors in Tables 4C-2, 4C-3, and/or 4C-4, if appropriate

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Treatment Cost Estimates

Low	Moderate	High
• Wayfinding Signs • Sharrows • Bike Lanes • Refresh or Install Lane Pavement Markings • "Do Not Stop On Tracks" Sign • Relocate Speed Transition	• Improve Sidewalk Connectivity • Increase Advanced Warning for RR Crossing • Relocate RR Equipment Shed* • Install ICWS • Install Intersection Curb • Relocate Obstructions	• Relocate Intersection • Actuated Traffic Signal w/ Preemption

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Questions?

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