



An Overview of a Systemic Safety Approach

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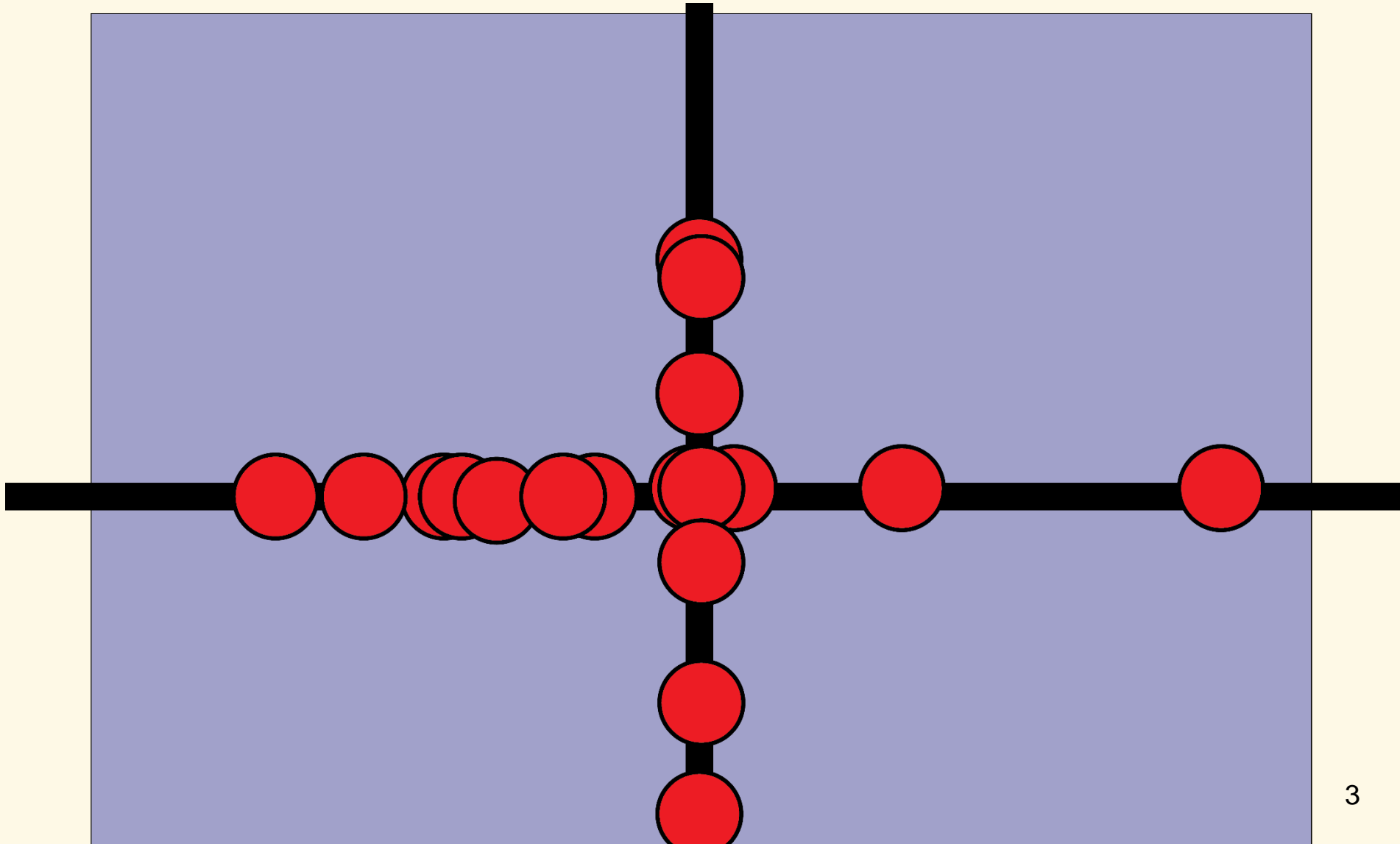
November 1, 2016



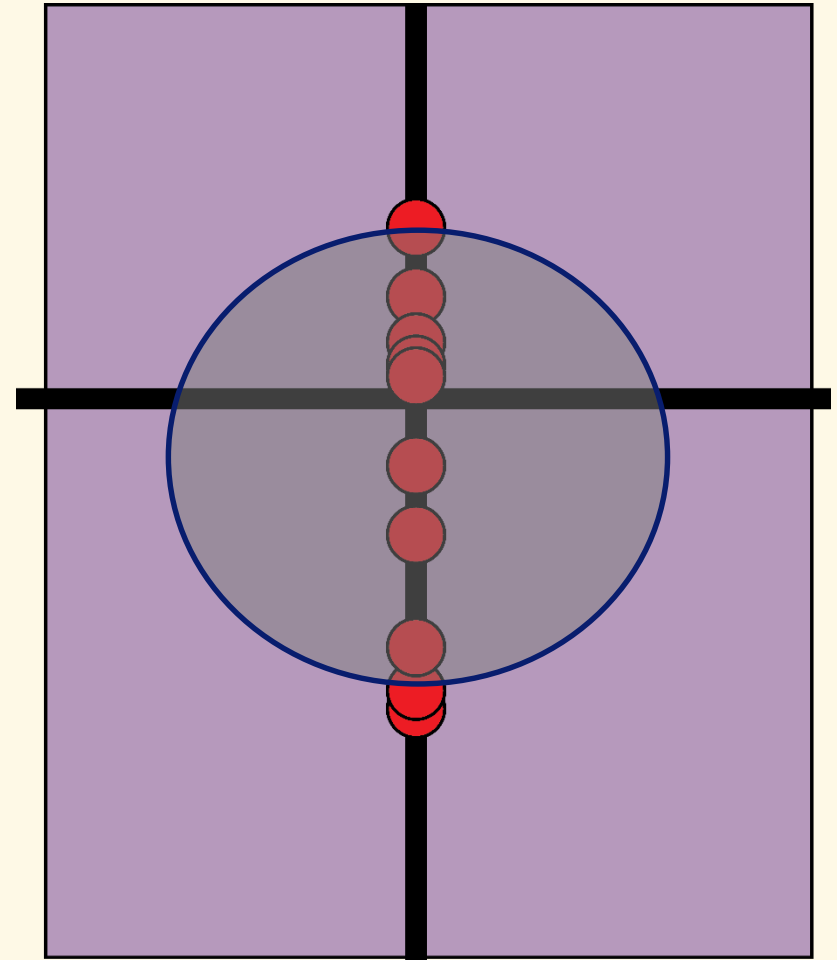
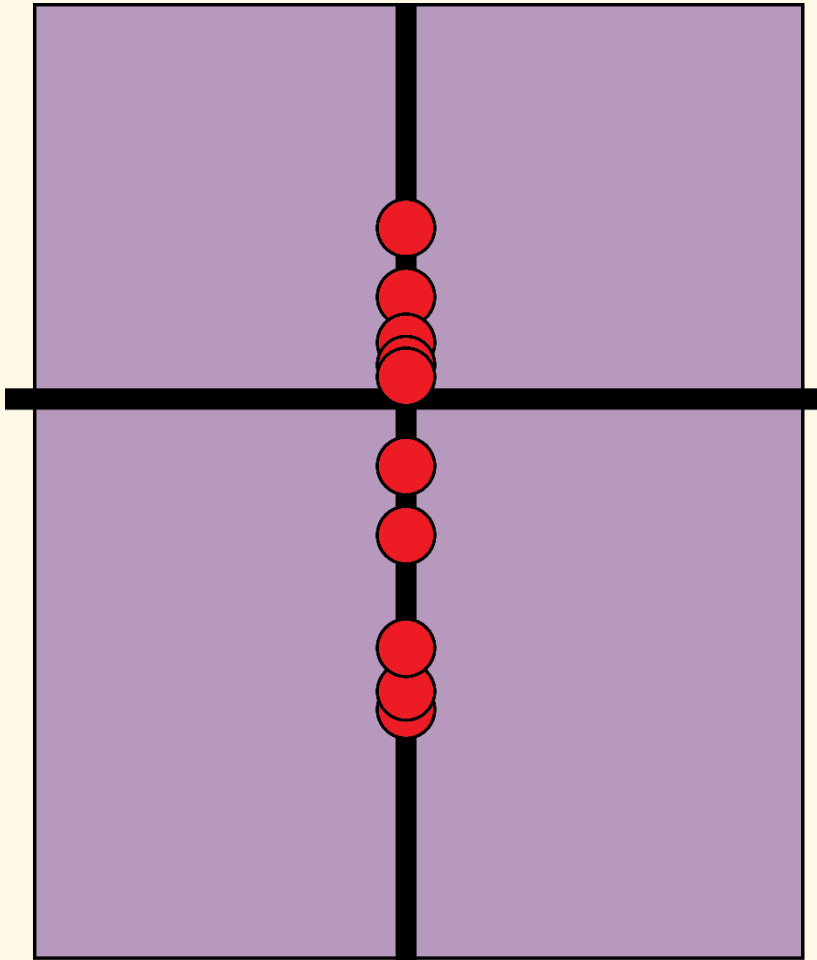
Objectives

- Describe “Systemic Safety Planning/Analysis”
- Examine Systemic Safety Analysis
 - Advantages
 - Data Needs
- Describe Systemic Analysis Components/Steps

Traditional Safety Analysis

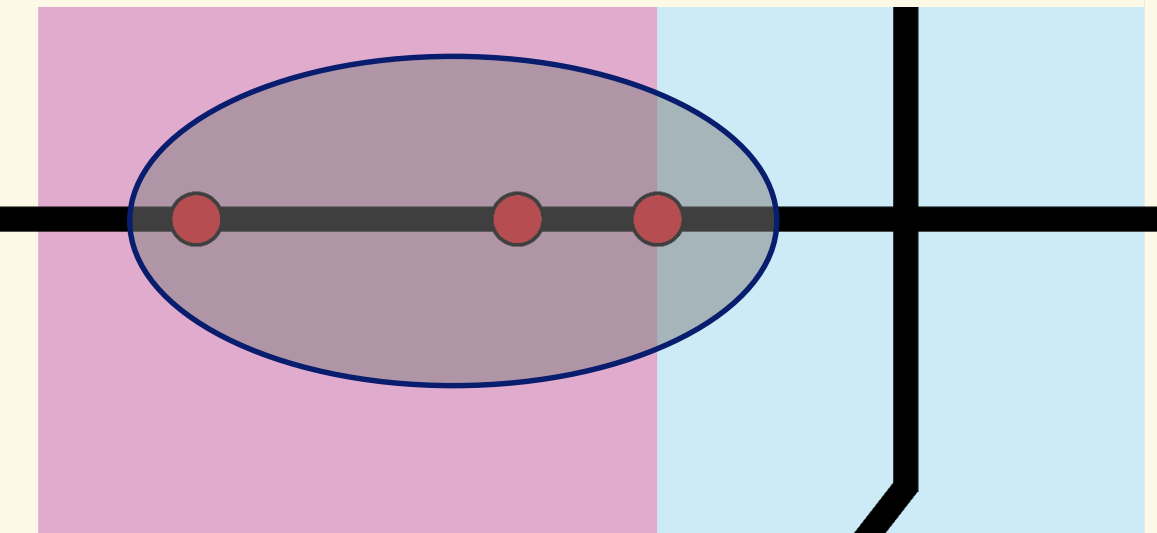
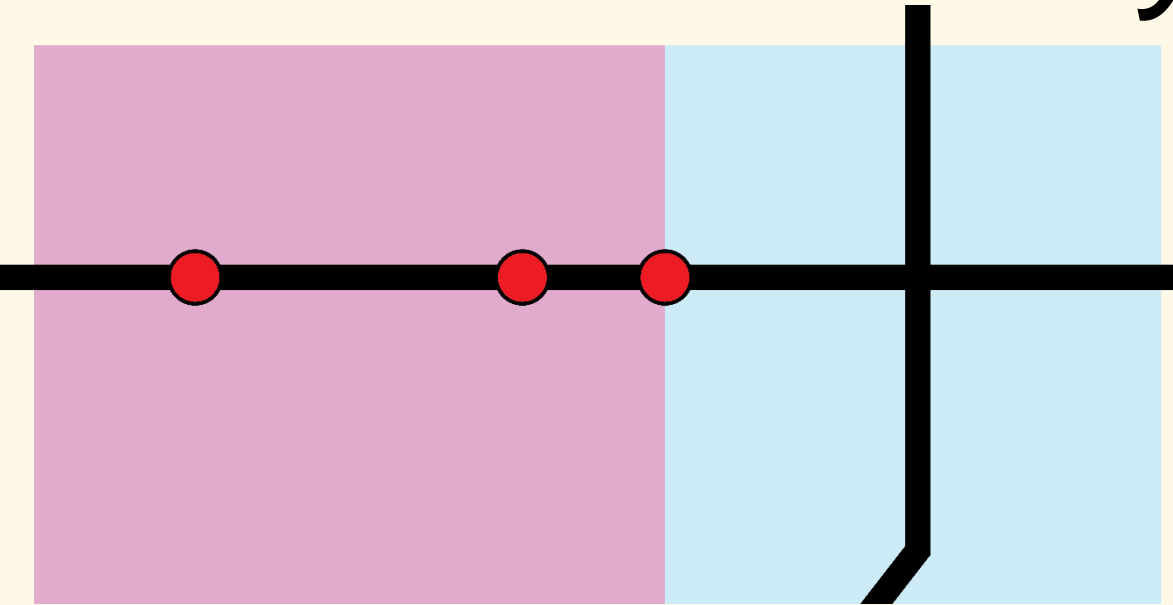


Traditional Safety Analysis



**Dark or Hot Spot
Intersection**

Traditional Safety Analysis



**Dark or Hot Spot
Segment**

Systemic Approach

- Appropriate when a significant number of severe crashes happen over a wide area:
 - Rural roads
 - Local roads
 - Address specific crash types
- Allows for analysis of locations that have not experienced a large number of crashes



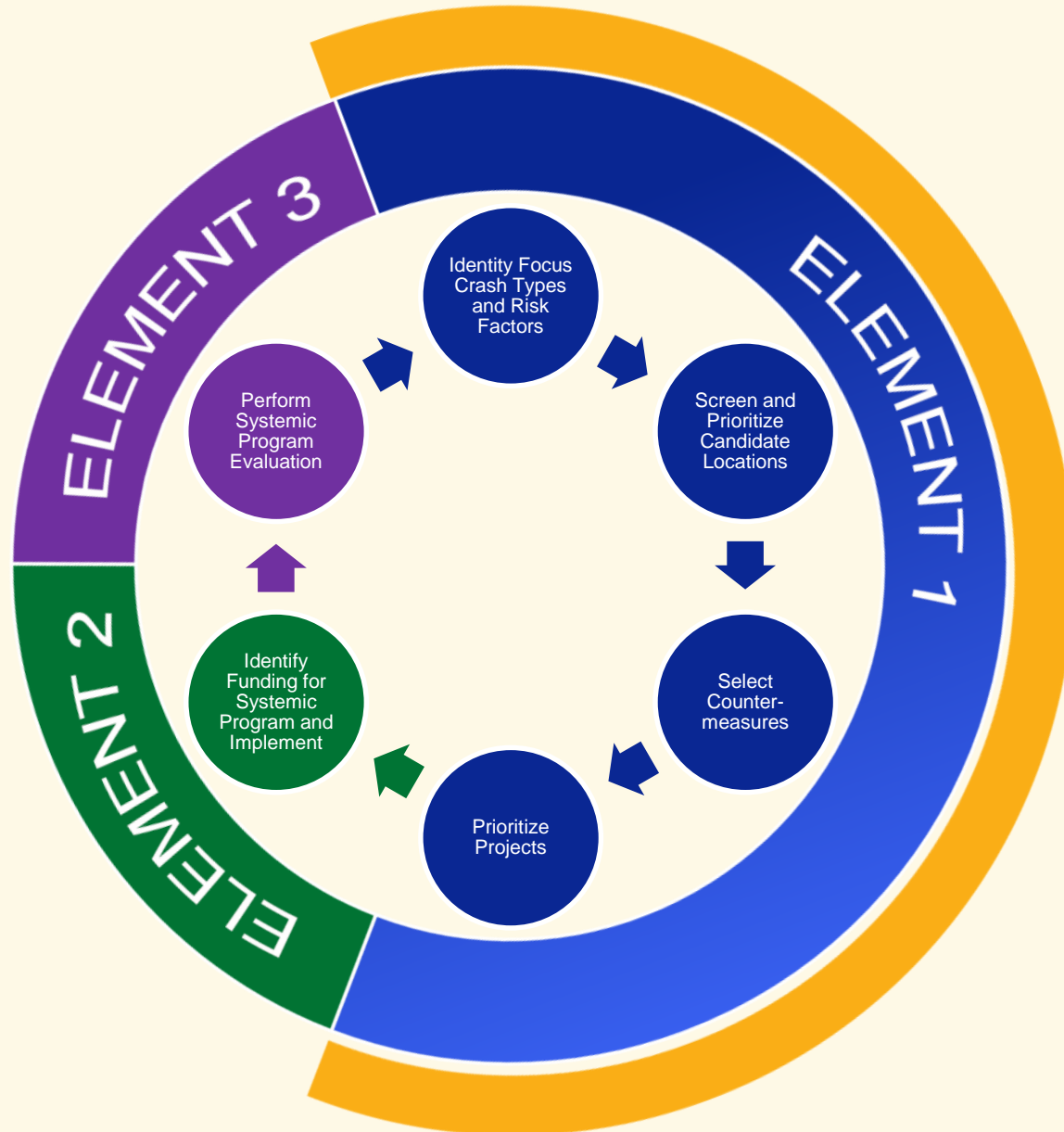
Factors Influencing Safety Analysis Approach

- Data availability
 - Resources
- Established methods
- Established priorities

Systemic Safety Project Selection Tool



Systemic Safety Process



Systemic Safety Process

- Examine the system as a whole
- Identify roadway elements with high crash **risk** that could be corrected on a system wide basis

Supplements traditional site analysis to form a comprehensive method for safety planning and implementation

Risk Factor: Defined Here

The potential for a specific type of severe crash to occur at a specific location because of the location's characteristics or features.

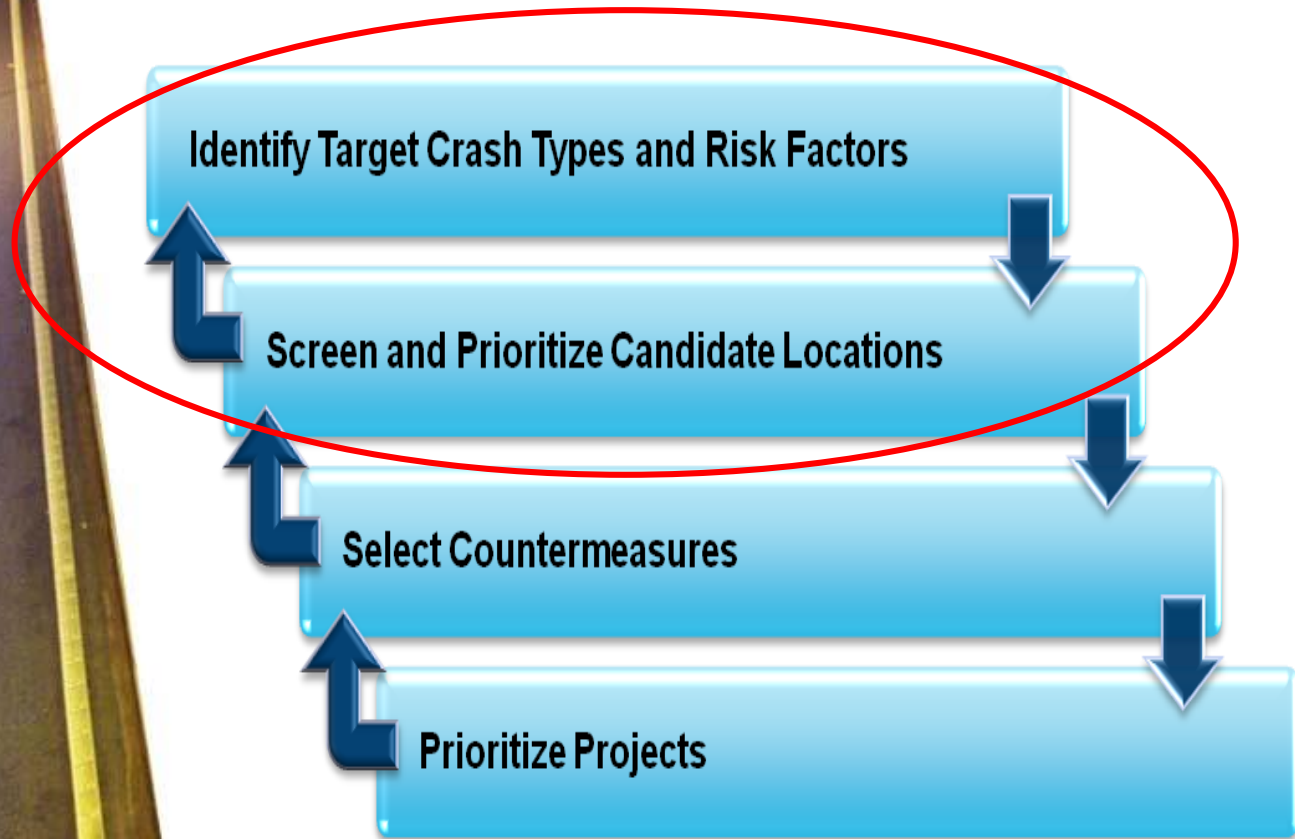




Potential Risk Factors

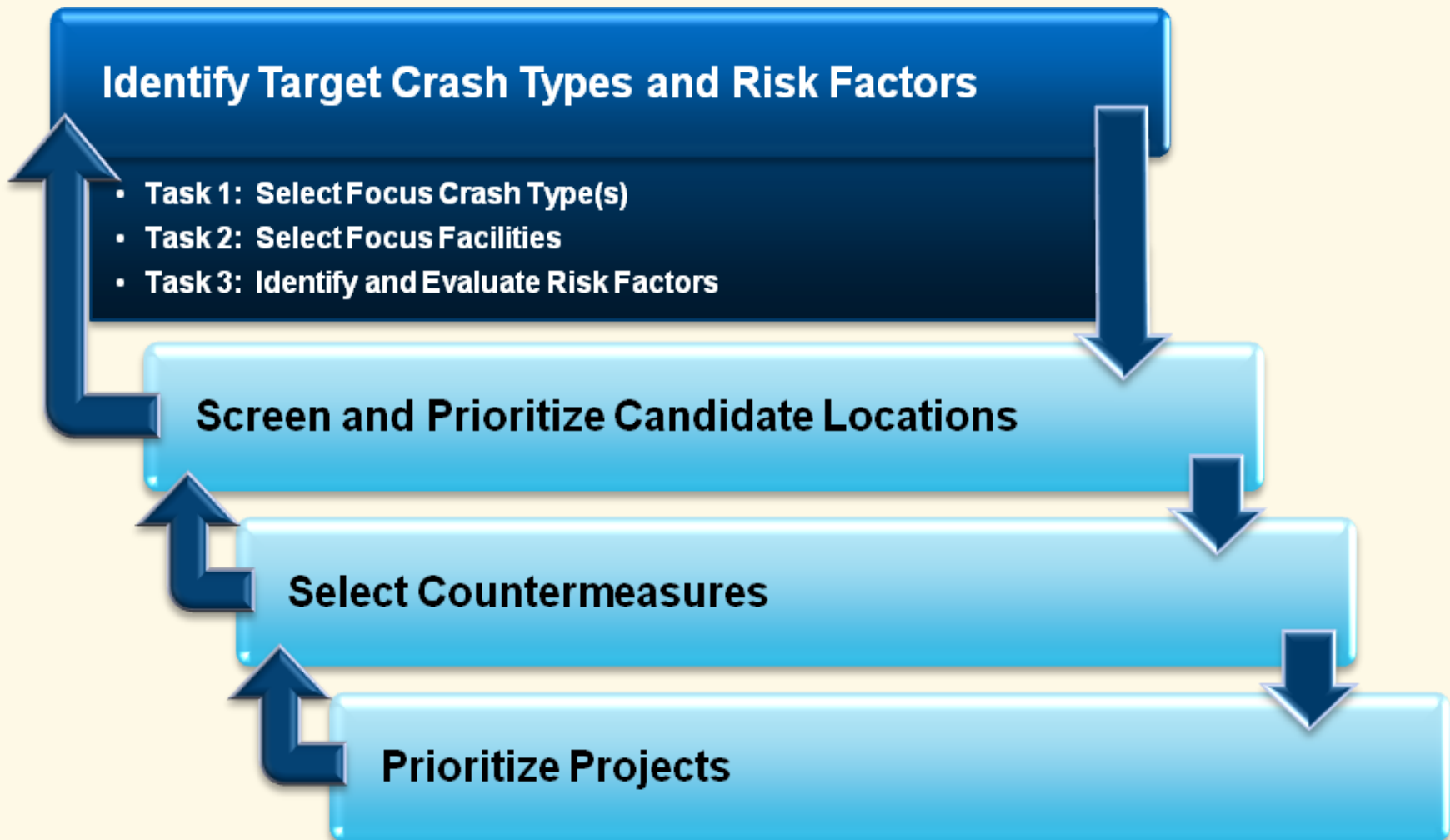
- Roadway Features
- Intersection Features
- Pedestrian-related Features

Element 1: Steps 1- 4



Element 1: Step 1

Step: Identify Target Crash Types and Risk Factors



Element 1: Step 1: Task 1

Task 1: Select Focus Crash Type(s)

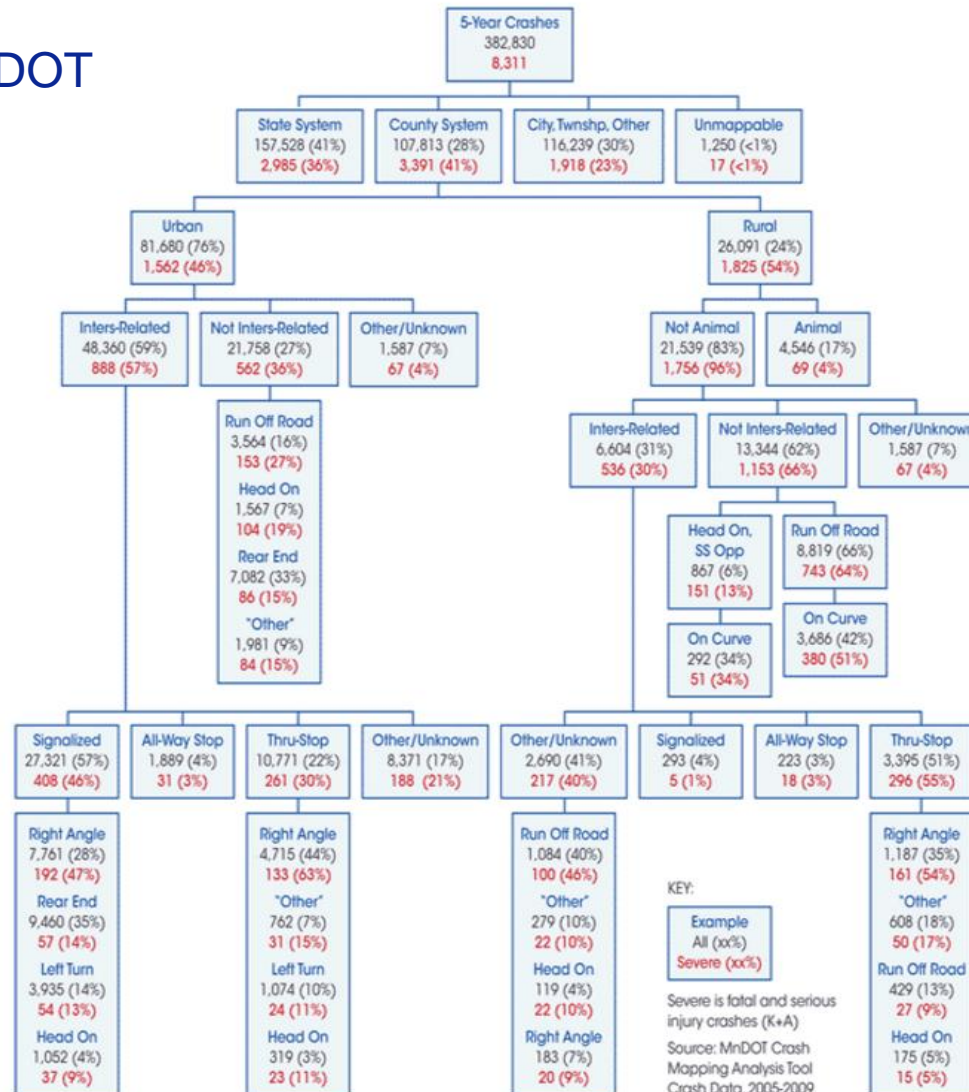
Example - Michigan Emphasis Areas

- High-risk Behaviors
 - Distracted Driving
 - Impaired Driving
 - Occupant Protection
- At-risk Road Users
 - Commercial Motor Vehicle Safety
 - Motorcycle Safety
 - Pedestrian and Bicycle Safety
 - Senior Mobility and Safety
 - Drivers Age 24 and Younger
- Engineering Infrastructure
 - Traffic Safety Engineering
 - Lane departure related
 - Intersection related
- System Administration
 - Traffic Incident Management
 - Traffic Records and Information Systems

Element 1: Step 1: Task 2

Task 2: Select Focus Facilities

Minnesota DOT





Element 1: Step 1: Task 3

Task 3: Identify & Evaluate Risk Factors

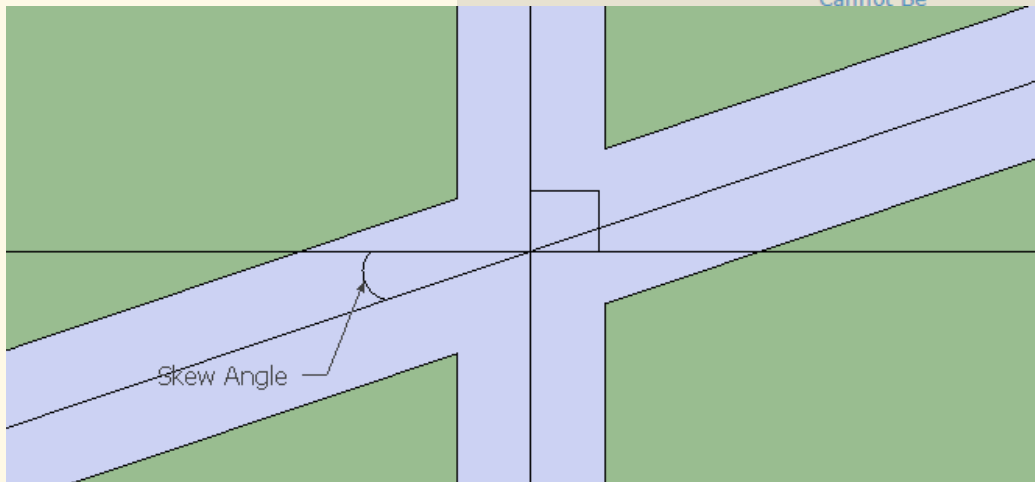
- Roadway and Intersection Features
 - Traffic Volume
 - Other Features

Focus Crash Type – Risk Factors

Example Focus Crash Type	Potential Risk Factors
Rural Crashes	
Road Departure	<ul style="list-style-type: none"> • Road edge condition • Access density • Curve density • Traffic volume
Road Departure in Horizontal Curve	<ul style="list-style-type: none"> • Curve radius • Speed differential (from tangent approach) • Visual trap • Intersection in the curve • Traffic volume
Intersection	<ul style="list-style-type: none"> • Skewed approach • Proximity to horizontal and/or vertical curve • Presence of commercial development • Proximity to at-grade railroad crossing • Traffic volume • Distance from previous controlled intersection
Urban Crashes	
Pedestrian	<ul style="list-style-type: none"> • Intersection control type • Major road characteristics (e.g., number of lanes, divided or undivided) • Traffic volume • Presence or proximity of pedestrian generator • Presence or proximity of transit stop • Presence of sidewalk
Intersection	<ul style="list-style-type: none"> • Left or right turn lanes • Left-turn signal phasing • Right-turn-on-red • Red-light enforcement • Intersection control • Number of lanes on major approach • Divided or undivided • Lighting • Traffic volume • Speed

CMFs

Change
Intersection
Skew Angle



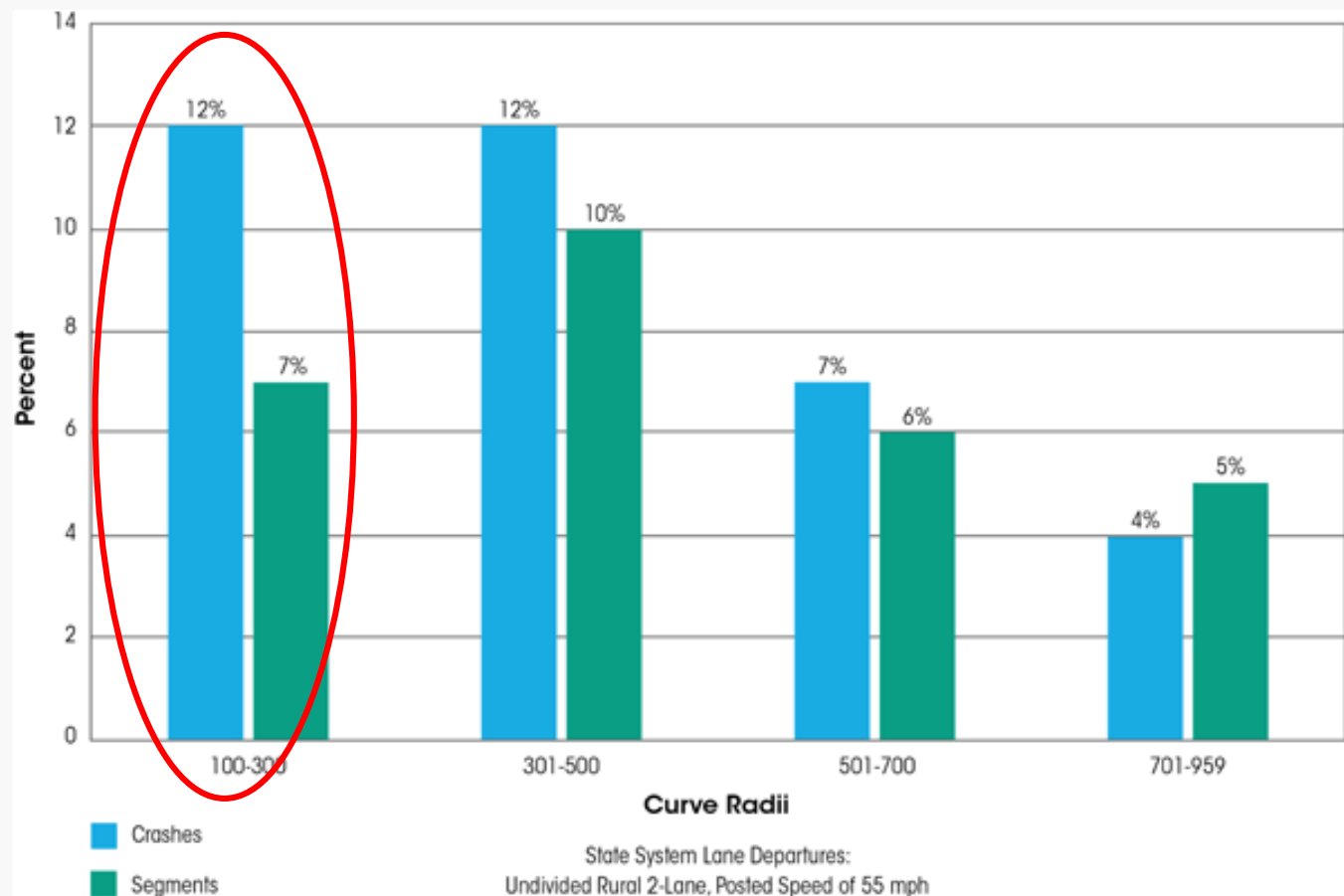
Install
Intersection
Lighting

Compare	CMF	CRF(%)	Quality	Crash Type	Crash Severity	Area Type	Reference	Comments
<input type="checkbox"/>	F(x)		Cannot Be Rated (HSM)	All	All	Rural	Harwood et al., 2000	HSM 1st Ed, page 14-17 ... [read more]
<input type="checkbox"/>	F(x)		Cannot Be Rated (HSM)	All	All	Rural	Harwood et al., 2000	HSM 1st Ed, page 14-17 ... [read more]
<input type="checkbox"/>			Cannot Be Rated (HSM)	All	All	Rural	Harwood et al., 2000	HSM 1st Ed, page 14-19 ... [read more]
<input type="checkbox"/>			Cannot Be Rated (HSM)	All	All	Rural	Harwood et al., 2000	HSM 1st Ed, page 14-19 ... [read more]
<input type="checkbox"/>			Cannot Be Rated (HSM)	Fatal,Serious injury		Rural	Harwood et al., 2000	HSM 1st Ed, page 14-20 ... [read more]
<input type="checkbox"/>			Cannot Be Rated (HSM)	Fatal,Serious injury		Rural	Harwood et al., 2000	HSM 1st Ed, page 14-20 ... [read more]

Compare	CMF	CRF(%)	Quality	Crash Type	Crash Severity	Area Type	Reference	Comments
<input type="checkbox"/>	0.881	11.9	★★★★☆	Nighttime	All	All	Donnell, Porter, Shankar, 2010	

Generate Critical Values and Assign

EXAMPLE 5. New York State Department of Transportation Evaluation of Curve Radii as a Potential Risk Factor

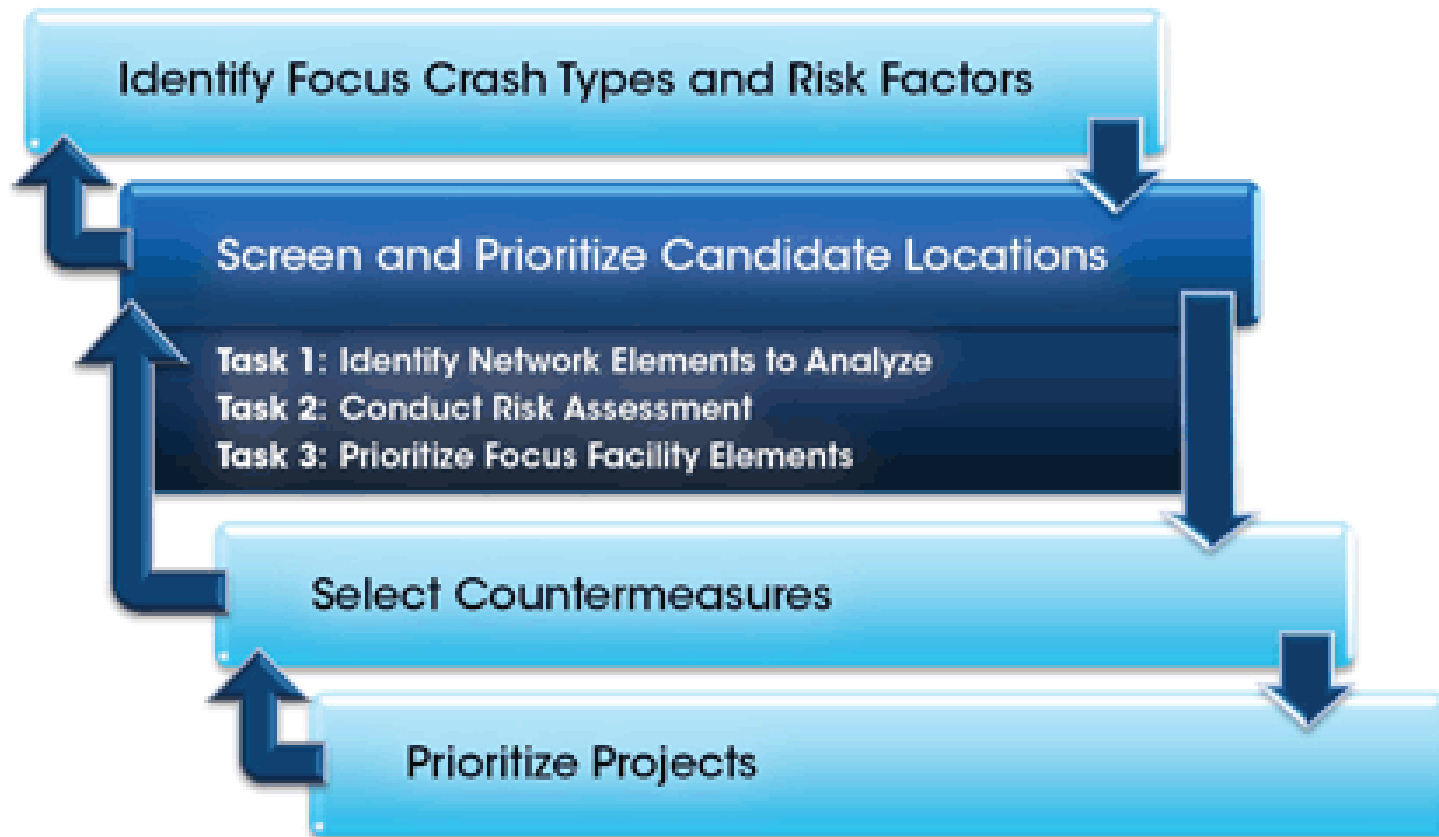


Data Needs

- SHSP
- Crash Data
- Roadway
 - MIRE

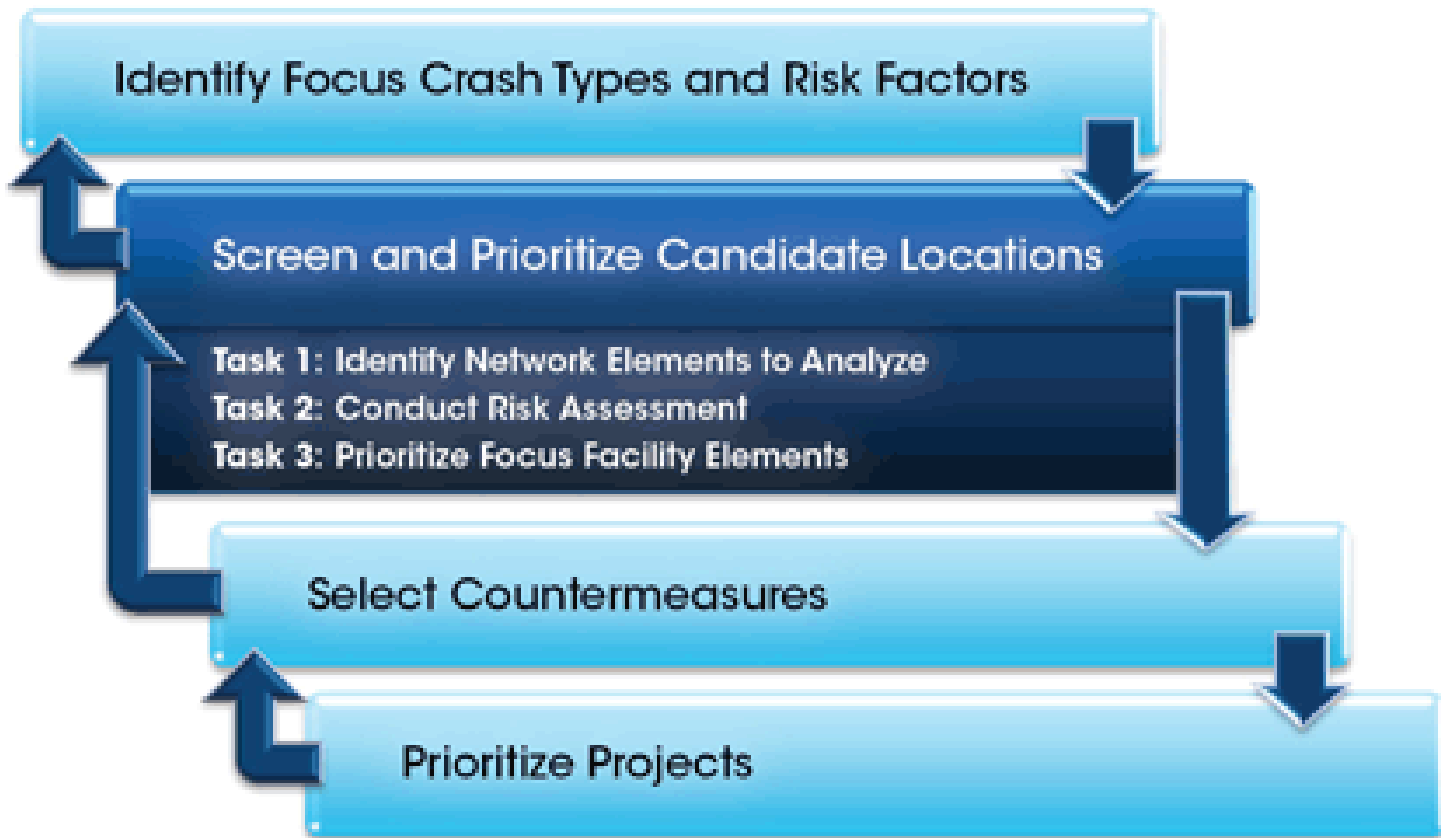
Element 1: Step 2

Step: Screen and Prioritize Candidate Locations



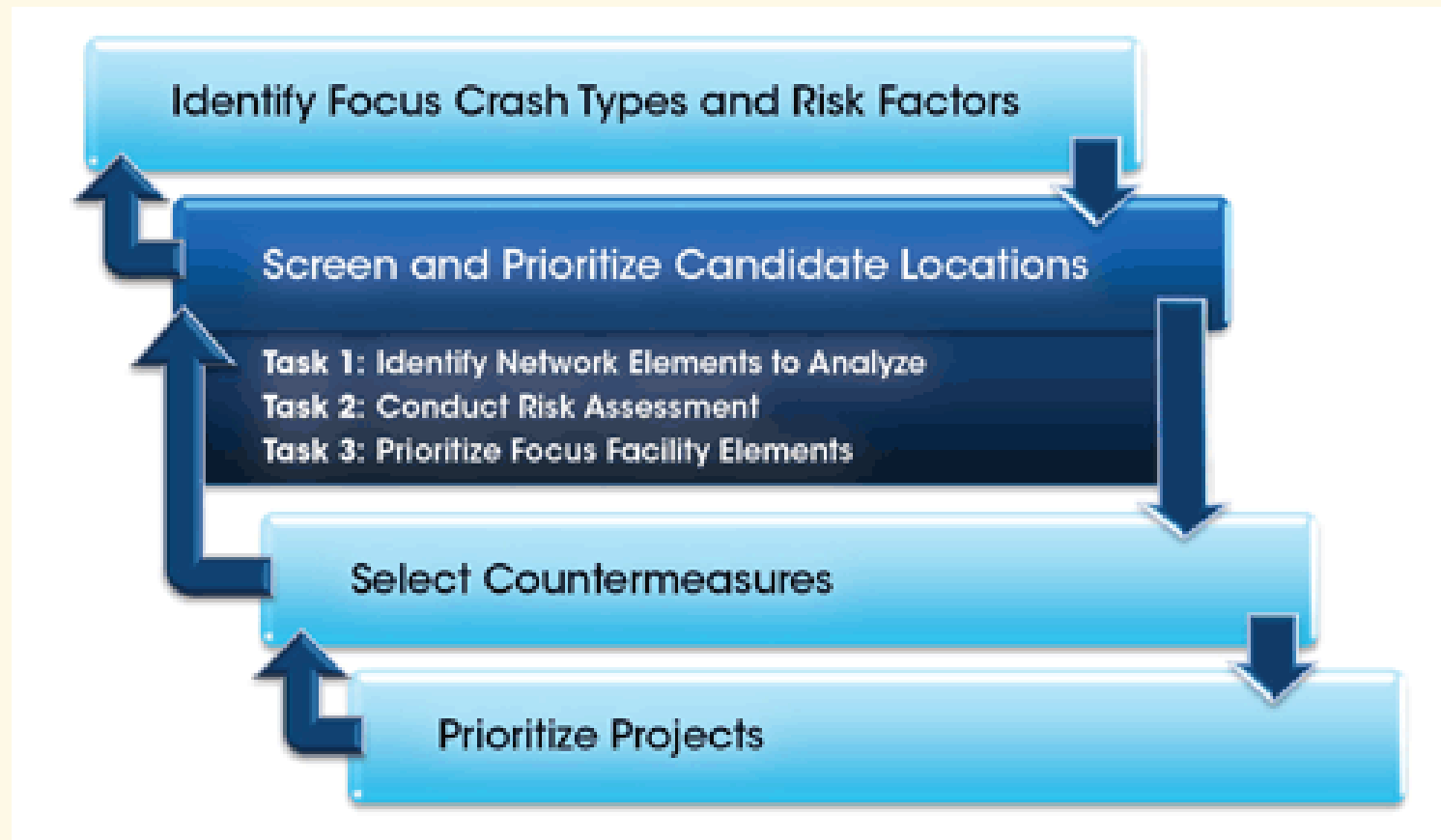
Step 2: Task 1

Task 1: Identify Network Elements to Analyze



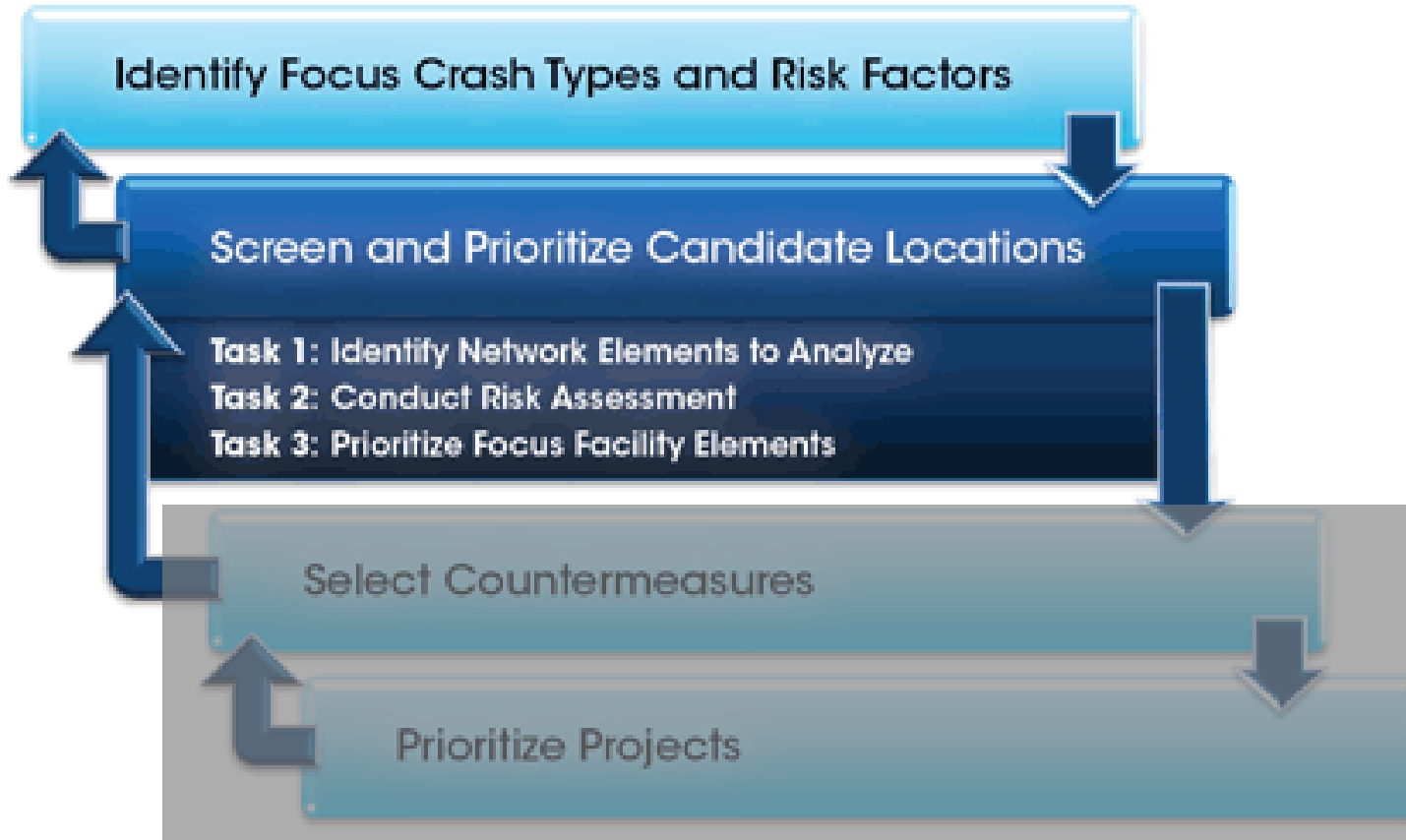
Step 2: Task 2

Task 2: Conduct Risk Assessment



Step 2: Task 3

Task 3: Prioritize Focus Facility Elements



Example

Illinois DOT

Data Collection Excel Intersection Layout 1

Intersection Data Sheet																						2007-2011 Crashes					
Intx ID	Intersection Streets	Rural/Urban	Traffic Control	Leg Count	Township	Right Turn Lane Present	Left Turn Lane Present	Major Route Through Lanes	Minor Route Through Lanes	NB AADT	SB AADT	NB/SB Max	EB AADT	WB AADT	EB/WB Max	Major AADT	Minor AADT	Total Entering Vehicles	Min/Maj Ratio Value	Street Lights	Flashers	Crash Severity					
																						K	A	B	C	PDO	
06-03	CH 6 & Hwy 10	Rural	1 or 2 Way Stop	4	Scott	No	No	2	2	150	1,500	1,500	2,800	1,900	2,800	2,800	1,500	3,175	0.536	No	No	0	2	0	0	13	
25-03	CH 25 & Hwy 10	Urban	Signalized; Multi-Phase; Actuated	4	Champaign	Yes	Yes	2	2	5,800	9,200	9,200	7,900	5,500	7,900	9,200	2,400	14,200	0.859	Yes	No	0	2	0	0	14	
50-06	CH 50 & US Hwy 150	Rural	Signalized; 2-Phase; Actuated	4	Mahomet	Yes	Yes	2	2	7,900	450	7,900	7,700	5,700	9,700	7,900	7,900	12,875	0.814	Yes	No	0	1	2	1	13	
01-01	CH 1 & CH 20	Rural	1 or 2 Way Stop	4	Hensley	No	No	2	2	3,850	2,700	3,850	1,200	800	1,200	3,850	1,200	4,275	0.312	No	No	0	1	3	1	2	
18-07	CH 18 & IL 130	Rural	1 or 2 Way Stop	4	Philo	No	Yes	2	2	10,700	9,700	10,700	4,200	200	4,200	10,700	4,200	12,400	0.393	Yes	No	0	1	2	0	3	
22-01	CH 22 & US Hwy 136	Rural	1 or 2 Way Stop	4	Kerr	No	No	2	2	275	1,300	1,300	2,050	2,250	2,250	2,250	1,300	2,938	0.578	No	No	0	1	0	1	3	
06-02	CH 6 & CH 18	Rural	1 or 2 Way Stop	4	Colfax	No	No	2	2	700	950	950	2,650	2,250	2,650	2,650	950	3,275	0.358	Yes	No	0	1	0	0	0	
09-02	CH 9 & US Hwy 45	Rural	1 or 2 Way Stop	4	Ludlow	No	No	2	2	3,300	3,450	3,450	650	550	650	3,450	650	3,975	0.188	Yes	No	0	0	0	0	4	
11-01	CH 11 & US Hwy 45	Rural	1 or 2 Way Stop	4	Rantoul	No	No	4	2	8,650	10,350	10,350	1,550	2,000	2,000	10,350	2,000	11,275	0.193	Yes	No	0	3	2	3	8	
55-01	CH 55 & US Hwy 136	Urban	Signalized; 2-Phase; Fixed	4	Ludlow	Yes	Yes	4	4	9,500	7,800	9,500	7,100	9,900	9,900	9,900	9,500	17,150	0.960	Yes	No	0	1	4	5	13	
15-01	CH 15 & Hwy 130	Rural	1 or 2 Way Stop	4	Philo	No	Yes	2	2	7,400	5,800	7,400	4,200	79	4,200	7,400	4,200	8,740	0.568	Yes	No	1	0	0	1	8	
18-02	CH 18 & CH 25	Rural	1 or 2 Way Stop	4	Tolono	No	No	2	2	2,050	275	2,050	4,000	3,300	4,000	4,000	2,050	4,813	0.513	No	No	0	1	1	2	1	
16-02	CH 16 & Hwy 130	Rural	1 or 2 Way Stop	4	Crittenden	No	No	2	2	3,300	3,550	3,550	150	750	750	3,550	750	3,875	0.211	No	No	0	1	0	0	1	
18-04	CH 18 & I-57 NB Ramps	Rural	Unknown	4	Tolono	Yes	Yes	2	0	0	500	500	4,900	4,900	4,900	4,900	500	5,400	0.102	Yes	No	0	1	0	0	1	
11-03	CH 11 & CH 32	Rural	1 or 2 Way Stop	3	Compromise	No	No	2	2	2,100	275	2,100	1,050	250	1,050	2,100	1,050	1,838	0.500	No	No	0	0	0	1	1	
15-02	CH 15 (West) & Hwy 49	Rural	1 or 2 Way Stop	2	South Homer	No	No	2	2	3,100	2,650	3,100	250	2,700	2,700	3,100	2,700	4,350	0.871	Yes	No	0	0	0	0	0	
25-02	CH 25 & Kirby Rd	Urban	Signalized; 2-Phase; Actuated	4	Champaign	Yes	Yes	2	2	7,200	5,800	7,200	4,600	2,950	4,600	7,200	4,600	10,275	0.639	No	No	0	2	2	0	8	
20-03	CH 20 & US Hwy 45	Rural	1 or 2 Way Stop	4	Somer	Yes	Yes	4	2	10,350	8,550	10,350	800	2,900	2,900	10,350	2,900	11,300	0.280	Yes	No	0	2	2	1	6	
12-01	CH 12 & CH 20	Rural	Unknown	4	Stanton	No	No	2	2	850	1,100	1,100	1,000	950	1,000	1,100	1,000	1,950	0.909	No	Yes	0	2	2	0	1	
14-01	CH 14 & Hwy 49	Rural	1 or 2 Way Stop	4	South Homer	No	No	2	2	2,800	2,800	2,800	200	450	450	2,800	450	3,125	0.161	No	No	0	2	0	0	2	
18-06	CH 18 & US Hwy 45	Rural	1 or 2 Way Stop	3	Tolono	Yes	Yes	4	2	9,700	8,500	9,700	200	2,900	2,900	9,700	2,900	10,650	0.299	No	No	0	1	1	0	8	
18-01	CH 18 & CH 19	Rural	1 or 2 Way Stop	4	Tolono	No	No	2	2	75	750	750	3,300	1,000	3,300	3,300	750	2,563	0.227	Yes	No	0	1	1	0	3	
18-05	CH 18 & US Hwy 45	Urban	Signalized; 2-Phase; Fixed	3	Tolono	Yes	Yes	4	0	11,500	10,500	11,500	0	4,200	4,200	11,500	4,200	13,100	0.365	Yes	No	0	0	2	1	10	
51-04	CH 51 & US Hwy 136	Urban	Signalized; 2-Phase; Fixed	3	Rantoul	Yes	Yes	4	0	4,100	0	4,100	9,900	10,000	10,000	10,000	4,100	12,000	0.410	Yes	No	0	0	0	0	4	
51-01	CH 51 & US Hwy 136	Urban	1 or 2 Way Stop	4	Rantoul	No	Yes	4	2	1,200	500	1,200	12,600	12,600	12,600	1,200	13,450	0.095	Yes	No	0	0	0	1	1	1	
32-01	CH 32 & US Hwy 136	Rural	1 or 2 Way Stop	4	Harwood	No	No	2	2	1,200	2,400	2,400	2,250	3,100	3,100	2,400	4,475	0.774	Yes	Yes	0	0	1	0	2		
50-02	CH 50 & CH 54 West	Rural	1 or 2 Way Stop	4	Mahomet	Yes	No	2	2	2,300	3,600	3,600	2,100	250	2,100	3,600	2,100	4,125	0.583	Yes	No	0	0	1	1	1	
01-02	CH 1 & CH 11	Rural	1 or 2 Way Stop	3	Hensley	No	No	2	0	0	2,350	2,350	750	2,850	2,850	2,850	2,350	2,975	0.825	No	No	0	0	0	0	1	
13-01	CH 13 & CH 15	Rural	1 or 2 Way Stop	4	South Homer	No	No	2	2	250	700	700	2,500	2,700	2,700	2,700	700	3,075	0.259	No	No	0	0	0	0	0	
11-02	CH 11 & CH 12	Rural	1 or 2 Way Stop	4	Compromise	No	No	2	2	450	800	800	1,050	1,200	1,200	800	1,750	0.667	No	No	0	0	0	0	0		
15-03	CH 15 (East) & Hwy 49	Rural	1 or 2 Way Stop	4	South Homer	No	No	2	2	3,100	3,100	3,100	2,150	250	2,150	3,100	2,150	4,300	0.694	Yes	No	0	0	0	0	0	
06-01	CH 6 & CH 17	Rural	1 or 2 Way Stop	4	Sadorus	No	No	2	2	1,100	25	1,100	700	1,600	1,600	1,600	1,100	1,713	0.688	No	No	0	0	0	0	0	
08-02	CH 8 & CH 30	Rural	1 or 2 Way Stop	4	East Bend	No	No	2	2	300	650	650	400	400	400	650	400	875	0.615	No	No	0	0	0	0	0	
17-01	CH 17 & CH 19	Rural	1 or 2 Way Stop	4	Pesotum	No	No	2	2	900	250	900	1,100	1,150	1,150	900	1,700	0.783	No	No	0	0	0	0	0	0	
51-03	CH 51 (East) & Hwy 45	Urban	Signalized; 2-Phase; Fixed	4	Ludlow	Yes	Yes	4	2	5,300	7,100	7,100	4,550	4,300	4,550	7,100	4,550	10,625	0.641	Yes	No	0	0	2	0	10	
01-03	CH 1 & US Hwy 136	Rural	1 or 2 Way Stop	4	East Bend	No	No	2	2	750	2,600	2,600	2,650	2,500	2,650	2,650	2,600	4,250	0.981	No	No	0	0	2	0	8	
50-04	CH 50 & I-74 WB Ramps	Rural	Unknown	4	Mahomet	Yes	Yes	2	0	9,700	9,700	9,700	0	1,300	1,300	9,700	1,300	11,000	0.134	Yes	No	0	0	0	1	8	
18-03	CH 18 & I-57 SB Ramps	Rural	Unknown	4	Tolono	No	No	2	0	900	0	900	4,000	4,000	4,000	4,000	900	4,900	0.225	Yes	No	0	0	1	0	5	
50-01	CH 50 & US Hwy 150	Rural	1 or 2 Way Stop	3	Mahomet	No	Yes	2	0	2,550	0	2,550	10,400	10,400	10,400	10,400	2,550	11,675	0.245	Yes	No	0	0	0	1	5	
17-02	CH 17 & US Hwy 45	Rural	1 or 2 Way Stop	4	Pesotum	Yes	Yes	2	2	8,500	3,650	8,500	300	1,300	1,300	8,500	1,300	6,875	0.153	Yes	No	0	0	1	0	3	
50-05	CH 50 & I-74 EB Ramps	Rural	Unknown	4	Mahomet	No	Yes	2	0	7,900	7,900	7,900	0	1,200	1,200	7,900	1,200	9,100	0.152	Yes	No	0	0	1	0	3	
50-03	CH 50 & CH 54 East	Rural	All-Way Stop	4	Mahomet	No	No	2	2	6,500	9,700	9,700	650	2,550	2,550	9,700	2,550	9,700	0.263	Yes	No	0	0	0	1	2	
20-02	CH 20 & I-57 NB Ramps	Rural	Unknown	4	Hensley	No	No	2	0	0	950	950	5,600	5,600	5,600	5,600	950	6,550	0.170	No	No	0	0	0	0	2	
51-02	CH 51 (West) & Hwy 45	Urban	Signalized; 2-Phase; Fixed	4	Rantoul	Yes	Yes	4	2	7,100	7,100	7,100	700	450	700	7,100	700	7,675	0.099	Yes	No	0	0	0	0	2	
25-01	CH 25 & Windsor Rd	Urban	All-Way Stop	4	Champaign	No	Yes	2	2	5,600	2,650	5,600	5,400	2,850	5,400	5,600	5,400	8,250	0.964	No	No	0	0	0	0	1	
20-05	CH 20 & CH 22	Rural	1 or 2 Way Stop	4	Ogden	No	No	2	2	950	800	950	650	1,050	1,050	950	950	1,725	0.905	Yes	No	0	0	0	0	1	
20-04	CH 20 & CH 24	Rural	1 or 2 Way Stop	4	Stanton	No	No	2	2	275	400	400	950	800	950	950	400	1,213	0.421	No	No	0	0	0	0	1	
30-01	CH 30 & US Hwy 136	Rural	1 or 2 Way Stop	3	Brown	No	No	2	0	1,800	0	1,800	2,500	2,500	2,500	2,500	1,800	3,400	0.720	No	No	0	0	0	0	1	
08-01	CH 8 & Hwy 47	Rural	1 or 2 Way Stop	4	Brown	No	No	2	2	3,400	3,550	3,550	175	250	250	3,550	250	3,688	0.070	No	No	0	0	0	0	1	
09-04	CH 9 & CH 22	Rural	1 or 2 Way Stop	4	Kerr	No	No	2	2	175	175	175	75	200	200	200	175	313	0.875	No	No	0	0	0	0	1	

Example

Illinois DOT

Data Collection Excel Intersection Layout 2

Intersection Data Sheet										Stars							Stars	Priority Group	Rank
Intx ID	Total All Severity Crashes	Total K+A Crashes	Crash Rate (All Severity Crashes)	Skewed Intx	On/Near Curve	RR X-ing Within 500 ft.	Nearest Stop Distance (miles)	Nearest Stop >5 miles?	Commercial Development Nearby	Skewed Intx	On/Near Curve	RR X-ing Within 500 ft.	Previous Stop >5 miles	Commercial Development Nearby	Total Crashes (K+A)	Min/Maj Ratio			
06-03	1	2	0.690	Yes	Yes	No	0.91	No	No	1	1	0	0	0	1	1	4	1	1
25-03	15	2	0.579	No	No	Yes	0.99	No	Yes	0	0	1	0	1	1	0	3	1	2
50-06	18	1	0.766	Yes	Yes	No	0.63	No	No	1	1	0	0	0	1	0	3	1	3
01-01	7	1	0.897	No	No	No	1.00	No	Yes	0	0	0	0	1	1	1	3	1	4
18-07	6	1	0.265	No	No	No	1.00	No	Yes	0	0	0	0	1	1	1	3	1	5
22-01	5	1	0.933	No	No	No	3.03	No	Yes	0	0	0	0	1	1	1	3	1	6
06-02	1	1	0.167	No	No	No	>5.00	Yes	No	0	0	0	1	0	1	1	3	1	7
09-02	4	0	0.551	Yes	Yes	No	0.36	No	Yes	1	1	0	0	1	0	0	3	1	8
11-01	16	3	0.778	No	No	No	>5.00	Yes	No	0	0	0	1	0	1	0	2	1	9
55-01	23	1	0.735	No	No	No	0.27	No	Yes	0	0	0	0	1	1	0	2	1	10
15-01	10	1	0.627	No	No	No	1.01	No	No	0	0	0	0	0	1	1	2	1	11
18-02	5	1	0.569	No	No	No	2.01	No	No	0	0	0	0	0	1	1	2	1	12
16-02	2	1	0.283	No	Yes	No	3.04	No	No	0	1	0	0	0	1	0	2	1	13
18-04	2	1	0.203	No	Yes	No	2.37	No	No	0	1	0	0	0	1	0	2	1	14
11-03	2	0	0.596	No	Yes	No	1.01	No	No	0	1	0	0	0	0	1	2	2	15
15-02	0	0	0.000	No	No	No	>5.00	Yes	Yes	0	0	0	1	1	0	0	2	2	16
25-02	12	2	0.640	No	No	No	0.99	No	No	0	0	0	0	0	1	0	1	2	17
20-03	11	2	0.533	No	No	No	3.52	No	No	0	0	0	0	0	1	0	1	2	18
12-01	5	2	1.405	No	No	No	4.18	No	No	0	0	0	0	0	1	0	1	2	19
14-01	4	2	0.701	No	No	No	2.44	No	No	0	0	0	0	0	1	0	1	2	20
18-06	10	1	0.515	No	No	No	1.65	No	No	0	0	0	0	0	1	0	1	2	21
18-01	5	1	1.069	No	No	No	2.04	No	No	0	0	0	0	0	1	0	1	2	22
18-05	13	0	0.544	No	No	No	1.01	No	No	0	0	0	0	0	0	1	1	0	23
51-04	4	0	0.183	No	Yes	No	0.27	No	No	0	1	0	0	0	0	0	1	0	24
51-01	3	0	0.122	Yes	No	No	0.15	No	No	1	0	0	0	0	0	0	1	0	25
32-01	3	0	0.367	No	No	No	>5.00	Yes	No	0	0	0	1	0	0	0	1	0	26
50-02	3	0	0.399	No	No	No	0.70	No	No	0	0	0	0	0	0	1	1	0	27
01-02	1	0	0.184	No	Yes	No	2.56	No	No	0	1	0	0	0	0	0	1	0	28
13-01	0	0	0.000	No	Yes	No	1.92	No	No	0	1	0	0	0	0	0	1	0	29
11-02	0	0	0.000	No	No	No	4.17	No	Yes	0	0	0	0	1	0	0	1	0	30
15-03	0	0	0.000	No	No	No	0.27	No	Yes	0	0	0	0	1	0	0	1	0	31
06-01	0	0	0.000	No	No	Yes	0.95	No	No	0	0	1	0	0	0	0	1	0	32
08-02	0	0	0.000	No	Yes	No	1.02	No	No	0	1	0	0	0	0	0	1	0	33
17-01	0	0	0.000	Yes	No	No	0.12	No	No	1	0	0	0	0	0	0	1	0	34
51-03	12	0	0.619	No	No	No	0.08	No	No	0	0	0	0	0	0	0	0	0	35
01-03	10	0	1.289	No	No	No	3.03	No	No	0	0	0	0	0	0	0	0	0	36
50-04	9	0	0.448	No	No	No	0.32	No	No	0	0	0	0	0	0	0	0	0	37
18-03	6	0	0.671	No	No	No	2.67	No	No	0	0	0	0	0	0	0	0	0	38
50-01	6	0	0.282	No	No	No	0.42	No	No	0	0	0	0	0	0	0	0	0	39
17-02	4	0	0.319	No	No	No	1.36	No	No	0	0	0	0	0	0	0	0	0	40
50-05	4	0	0.241	No	No	No	0.09	No	No	0	0	0	0	0	0	0	0	0	41
50-03	3	0	0.169	No	No	No	0.70	No	No	0	0	0	0	0	0	0	0	0	42
20-02	2	0	0.167	No	No	No	0.45	No	No	0	0	0	0	0	0	0	0	0	43
51-02	2	0	0.143	No	No	No	0.08	No	No	0	0	0	0	0	0	0	0	0	44
25-01	1	0	0.066	No	No	No	0.99	No	No	0	0	0	0	0	0	0	0	0	45
20-05	1	0	0.318	No	No	No	2.99	No	No	0	0	0	0	0	0	0	0	0	46
20-04	1	0	0.452	No	No	No	2.66	No	No	0	0	0	0	0	0	0	0	0	47
30-01	1	0	0.161	No	No	No	0.40	No	No	0	0	0	0	0	0	0	0	0	48
08-01	1	0	0.149	No	No	No	2.01	No	No	0	0	0	0	0	0	0	0	0	49
09-04	1	0	1.753	No	No	No	0.98	No	No	0	0	0	0	0	0	0	0	0	50
55-02	1	0	0.142	No	No	No	0.46	No	No	0	0	0	0	0	0	0	0	0	51
20-01	0	0	0.000	No	No	No	0.27	No	No	0	0	0	0	0	0	0	0	0	52
09-01	0	0	0.000	No	No	No	1.00	No	No	0	0	0	0	0	0	0	0	0	53
09-03	0	0	0.000	No	No	No	1.00	No	No	0	0	0	0	0	0	0	0	0	54



Summary

- Supplements traditional approach
- Appropriate on local roads where there are few crashes over a lot of miles of roadway
- Allows pro-active approach
- Can be used as a Network Screening technique
- Data Driven
- Utilizes MIRE type data



Questions

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