

INDOT Greenfield Dist. Creates a Traffic Project

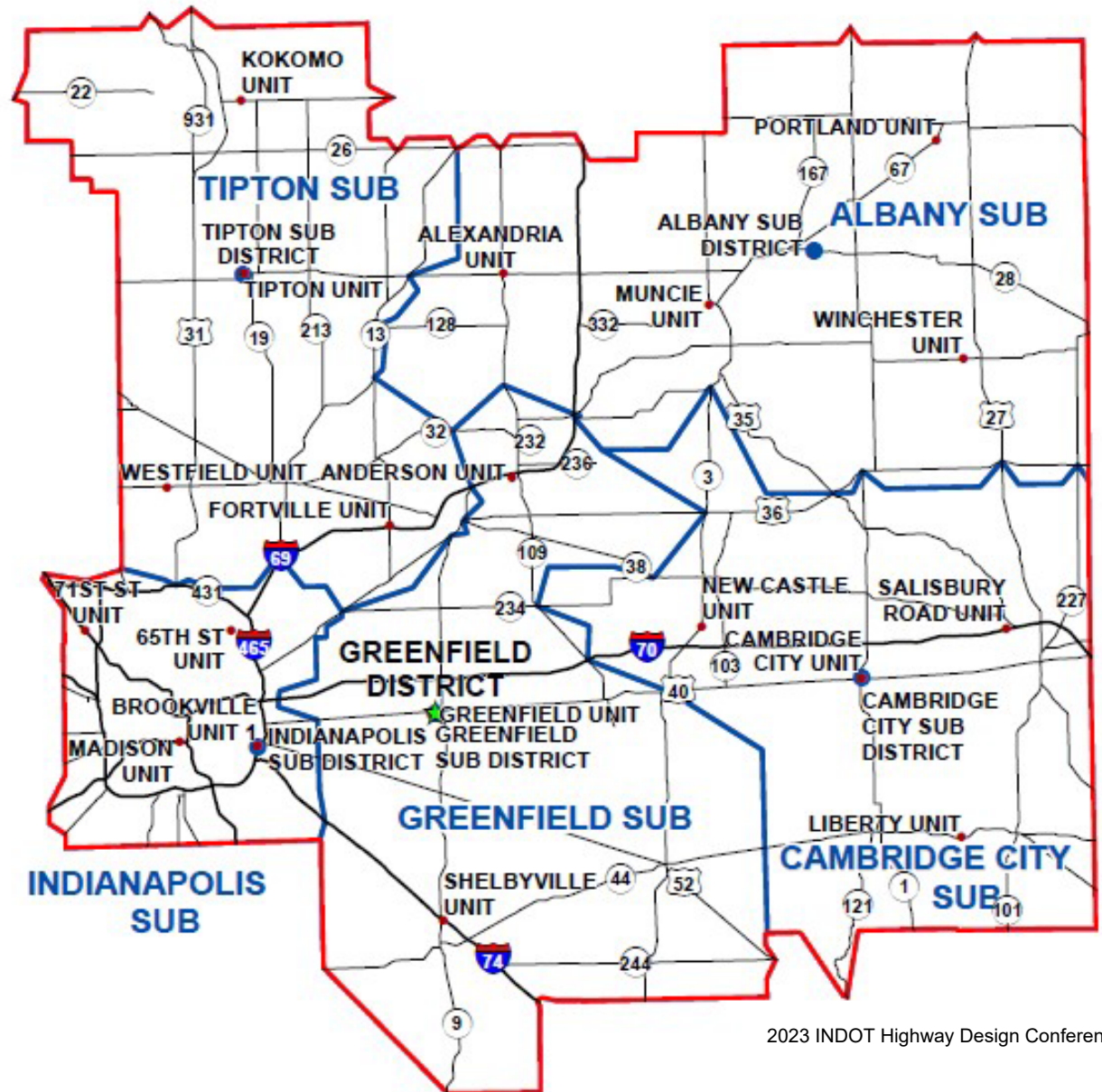
Luis A. Laracuente, P.E., M.S.
District Traffic Engineer



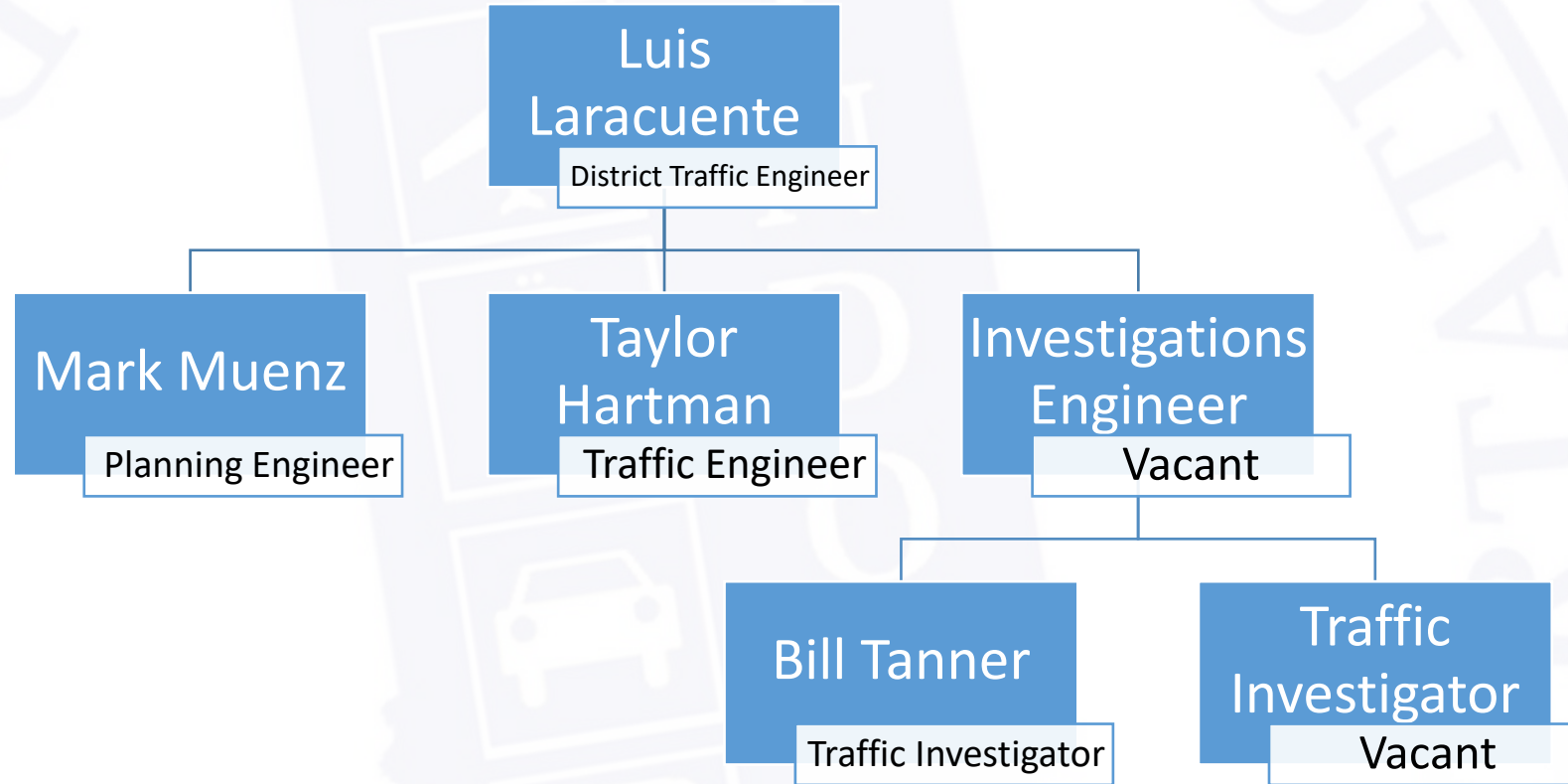
East Central – Greenfield District

Assets

- 4,375 lane miles of state roads
- 1,300 lane miles of interstate
- 1,200 state bridges
- 1,461 large culverts
- ~ 12,000 small culverts
- **859 traffic signals**
- **360 flashers**
- ~ 52,000 road signs
- ~ 1,500 panel signs
- ~ 7,000 luminaires
- 926,000 SFT special markings



District Traffic Team



INDOT Mission

Collaboratively plan, build, and maintain safe and innovative transportation infrastructure that enhances quality of life, drives economic growth, and accommodates new modes of transport.

Funding Year

2028 Projects were recently deliberated

Districts currently developing 2029 projects



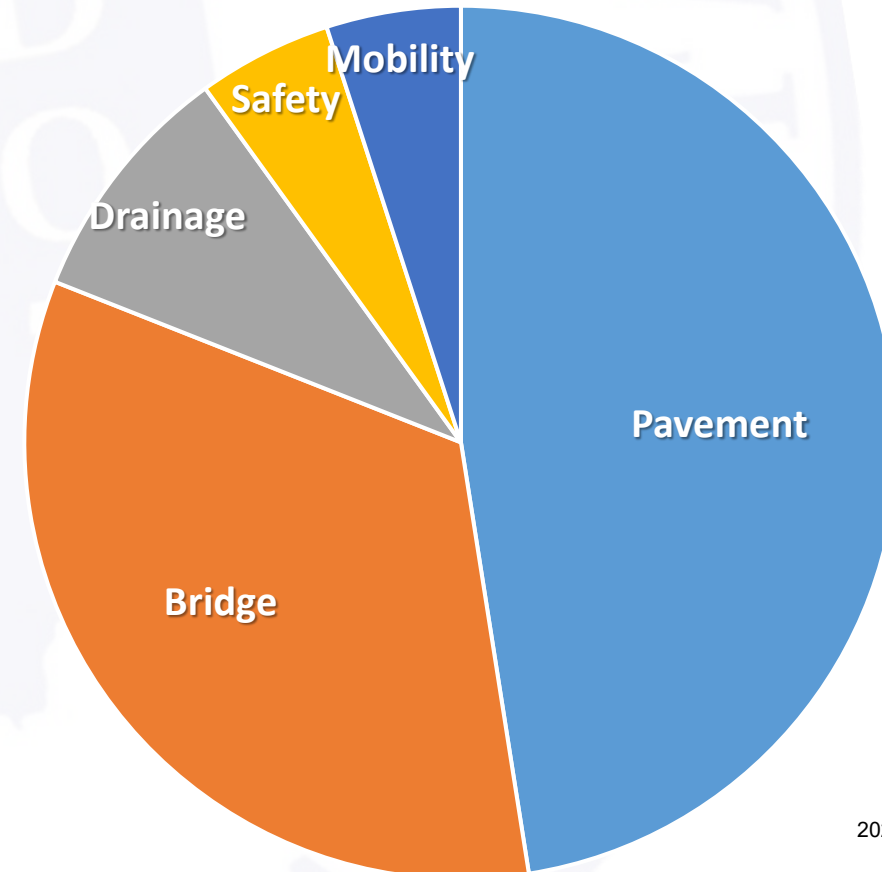
Statewide Asset Funding

Preservation Funding - FY 2027

- Pavement – \$525 million
- Bridge – \$370 million
- Drainage (new) – \$ 100 million
- Traffic Signals – \$25 million
- Others...

Traffic Safety & Mobility - FY 2027

- **Safety – \$55 Million**
- **Mobility – \$75 Million**

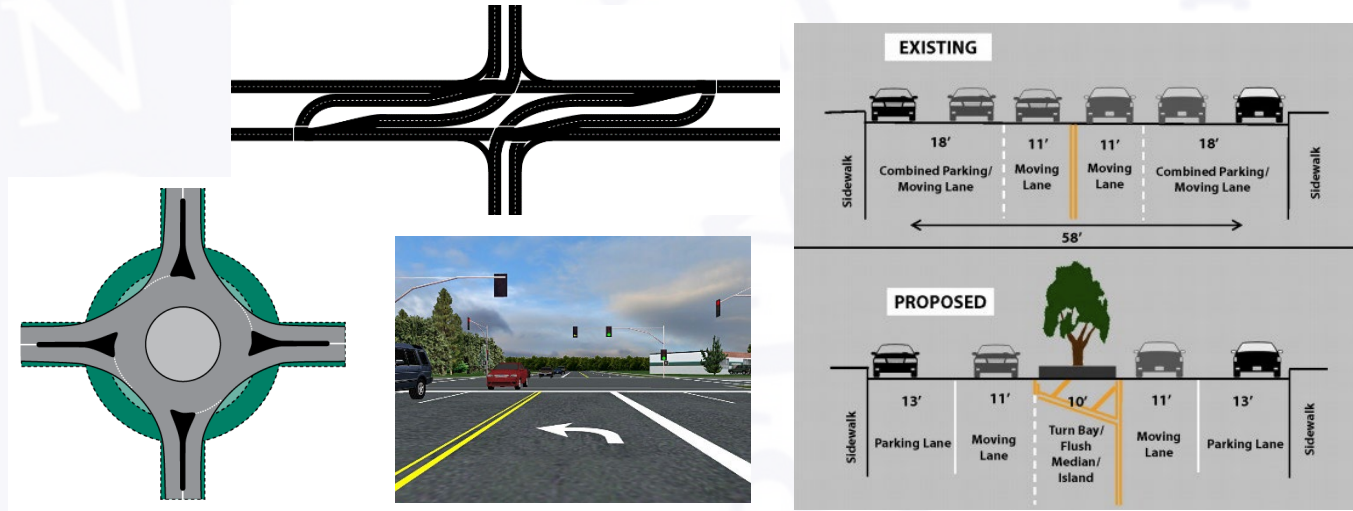


Traffic Safety Funding

- \$55 million in 2027 statewide funding
- 2 – types of projects:

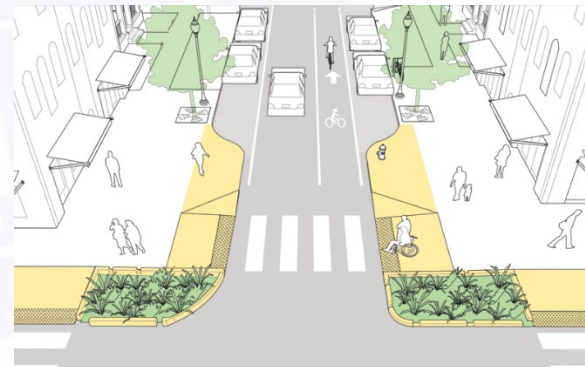
- **SPOT IMPROVEMENTS**

- All Districts compete for ~30 million



- **SYSTEMIC**

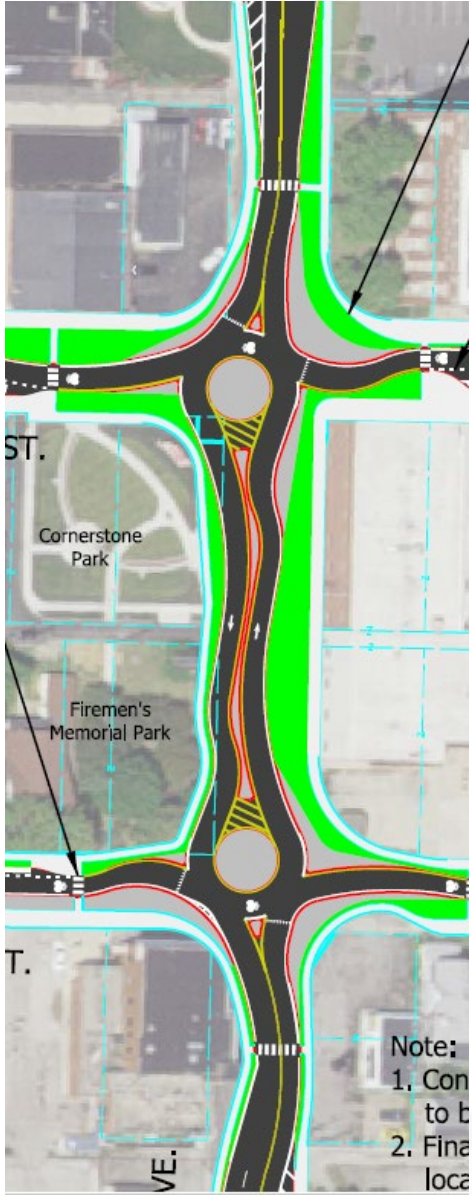
- Each District is Assigned ~ 4 million
- Signal Modernizations ~ 5 million
- RPM Replacement



tLevel
ANA

2023 INDOT Highway Design Conference

Safety submittals in 2027

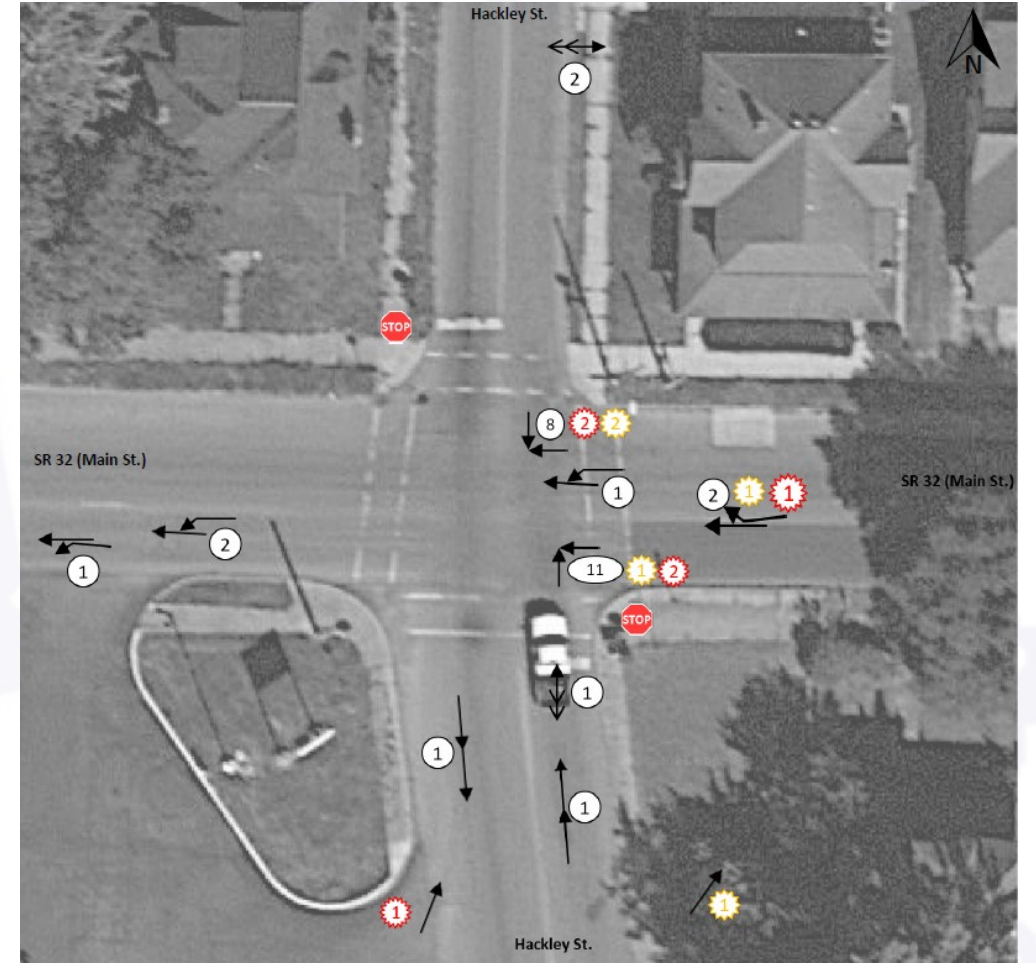
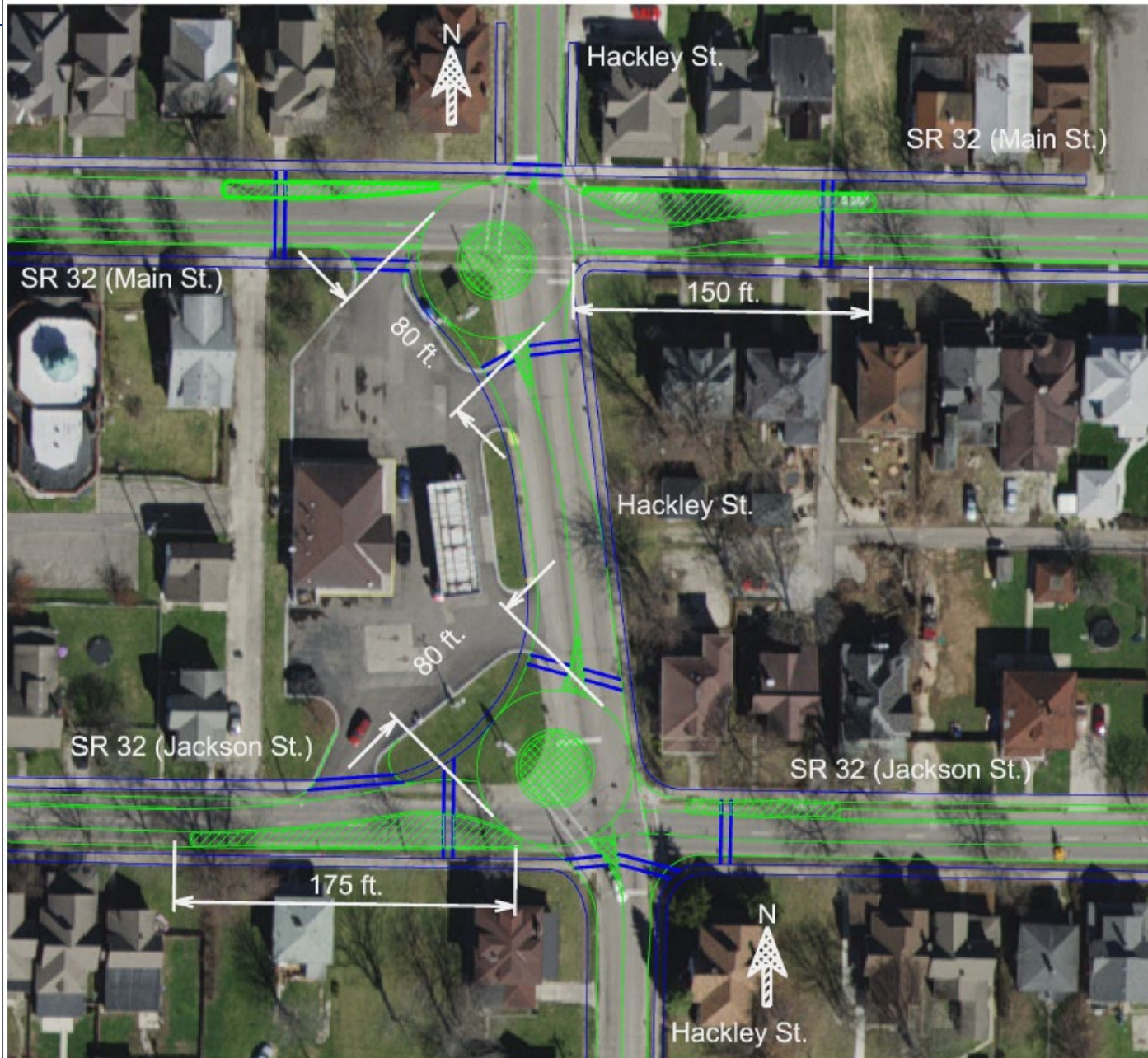


SR 32 (Main St) & Madison St



SR 32 (Jackson St) & Madison St

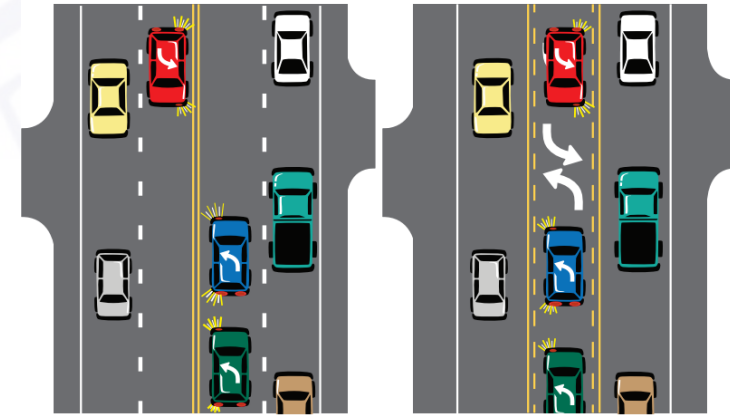
Safety submittals in 2027



Right Sizing Success Story

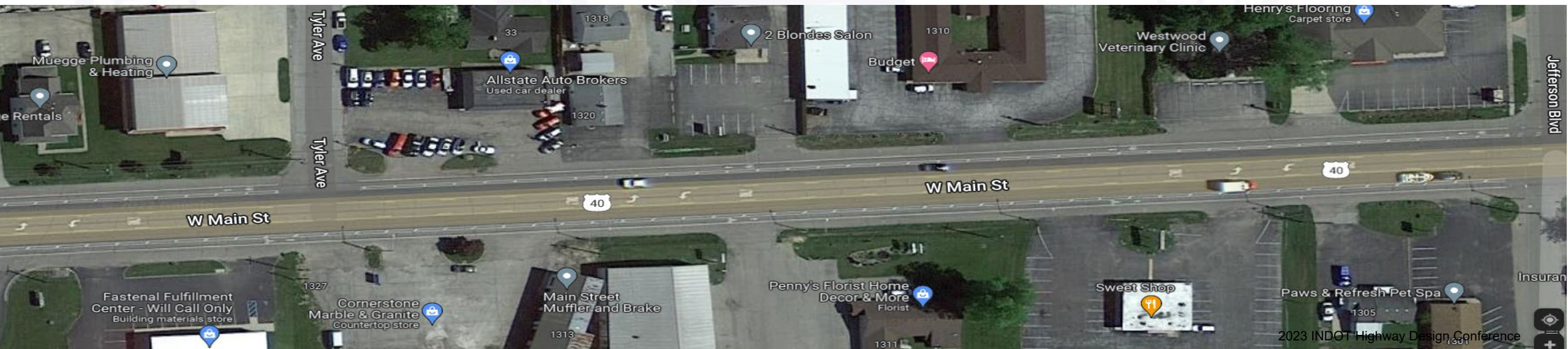
3-Years After Construction

- **69%** less target crashes (71 to 22)
- **68%** less incapacitating injuries (22 to 7)
- **65%** less property damage crashes (60 to 21)



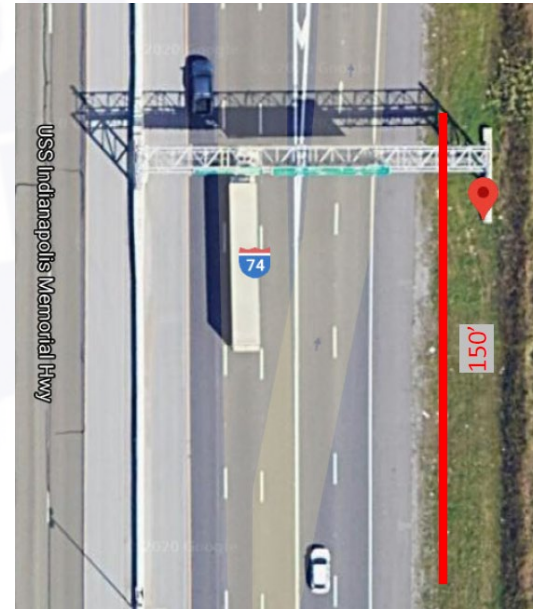
Before
A four-lane road behaving like a three-lane road.

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

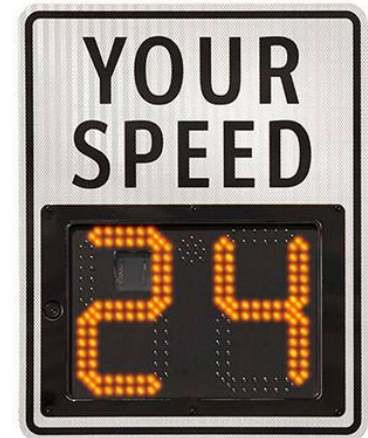
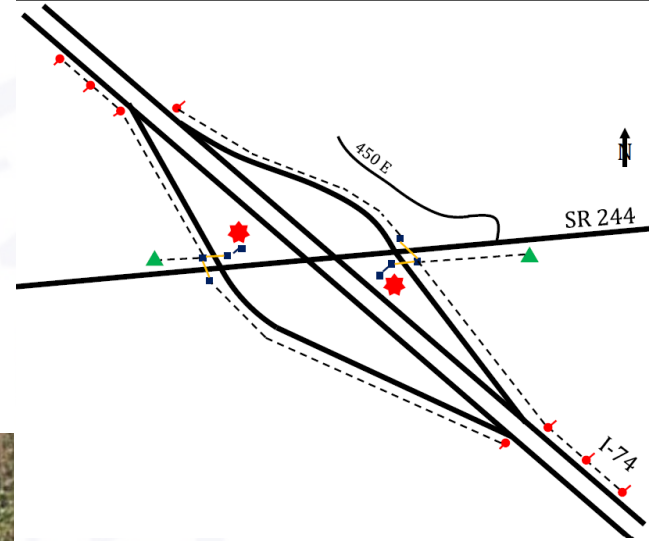


Example Systemic

- Add lighting to interchanges (16)
- Enhance curve signage districtwide
- High Friction Surface treatment
- Shield Roadside Hazards
- Speed feedback sign as gateway treatment to small towns (2027)
- Push Button activated flashers at uncontrolled school crossings (2027)

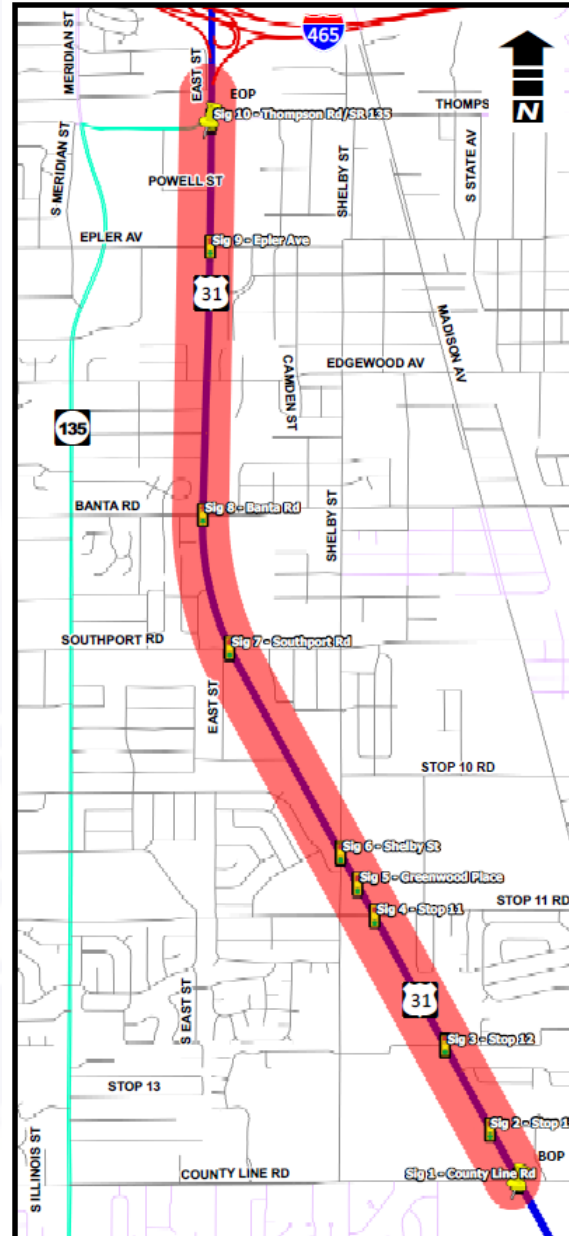


I-74 at SR 244
Proposed Partial Interchange Highway Lighting



Sidewalks (New)

- \$20 million
- New Sidewalk
- Reconstruct existing sidewalk



Traffic Mobility Funding

- \$75 million for 2027
- 2 – types of projects:
 - Very expensive projects
 - Typically, special funding
 - System interchanges
 - Added Interstate lanes



- District Mobility Projects
 - Corridor Projects
 - Added lanes
 - Interchanges



INDIANA DEPARTMENT OF TRANSPORTATION

SAFETY & MOBILITY STUDY

SR 32 from Willow Creek Way to Mensa Drive
IN THE GREENFIELD DISTRICT



Mobility Project Example

- SR 32 Added Travel Lanes
 - 5mi between Westfield and Noblesville
 - Access Management
 - Sidewalks
- US 31 added turn lanes along side streets
- US 31 & /SR 135/Thompson Rd
 - Continuous Flow Intersection



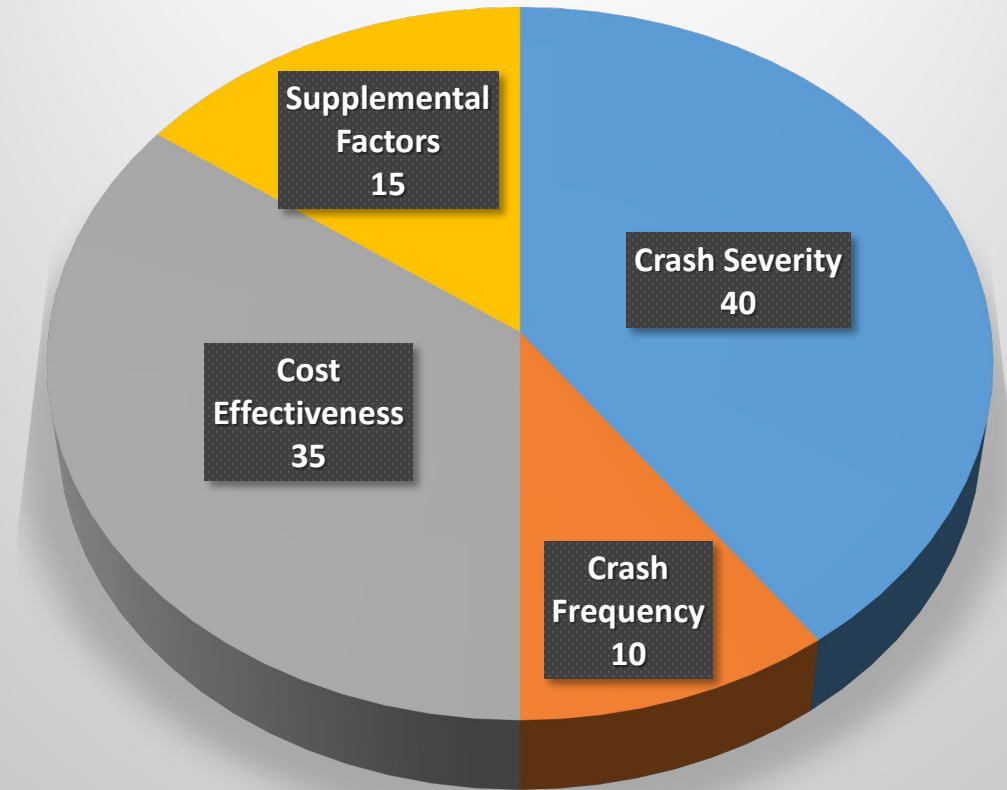
Project Scoring - Safety

Safety

- Its all about reducing injury crashes
- Expected Crash Reduction vs Cost
- Supplemental Factors
 - Local support
 - Multimodal components
- 0 to 100 scoring scale



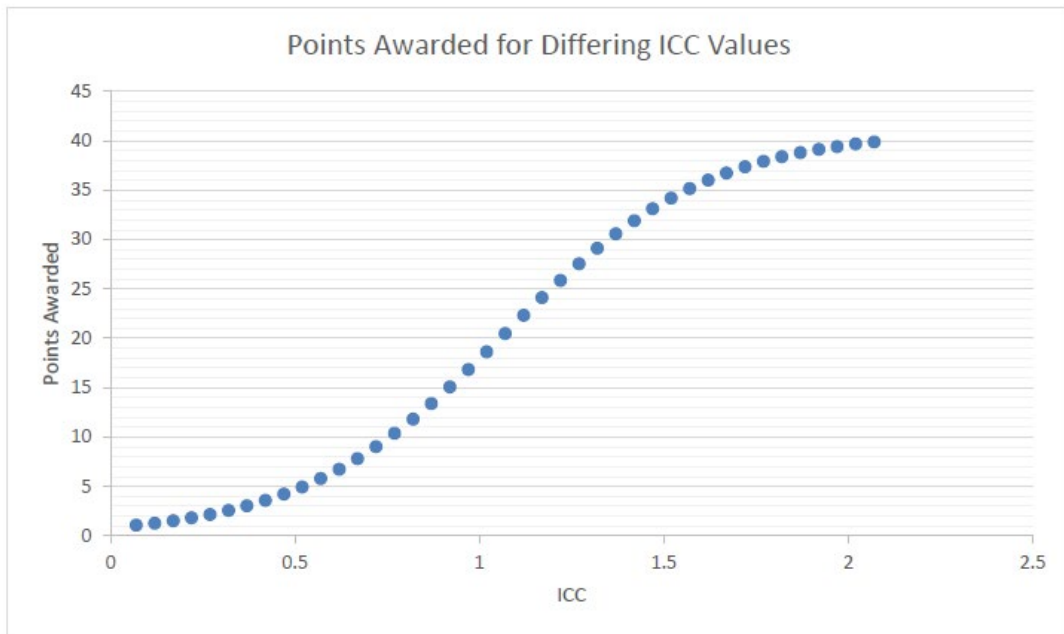
Scoring Factors



Crash Severity and Frequency

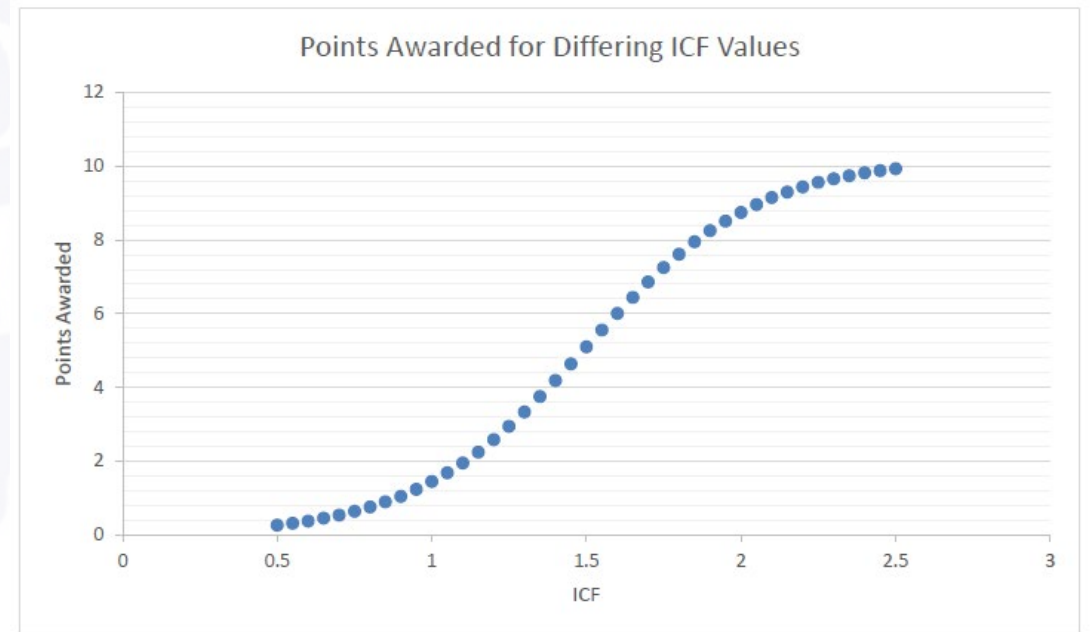
Crash Severity

- Called Index of Crash Cost (ICC)
- Number of Severe (Fatal/Injury) Crashes compared to Traffic Volume



Crash Frequency

- Called Index of Crash Frequency (ICF)
- Total Number of Crashes compared to Intersection Traffic Volume



Cost Effectiveness

- Predicted crash reduction vs. Project Cost
- Crash Reduction Factor
 - Statistical measurements of how effective roadway changes are at reducing crashes



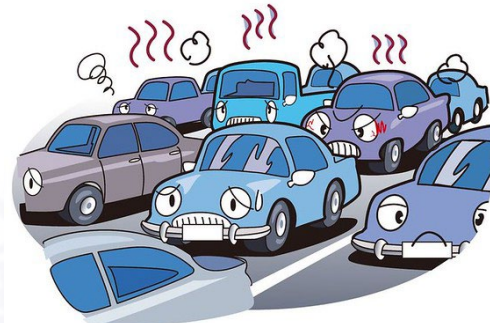
Source: <https://safety.fhwa.dot.gov/intersection/roundabouts/>

Category	Countermeasure	Area Type	Facility Type	Crash Type	CRF
Intersection Geometry	Convert a Two-Way Stop to a Roundabout	Urban	Two or Four Lane Roads	Total	27 %
				Injury	58 %
		Rural	Two or Four Lane Roads	Total	48 %
				Injury	61 %

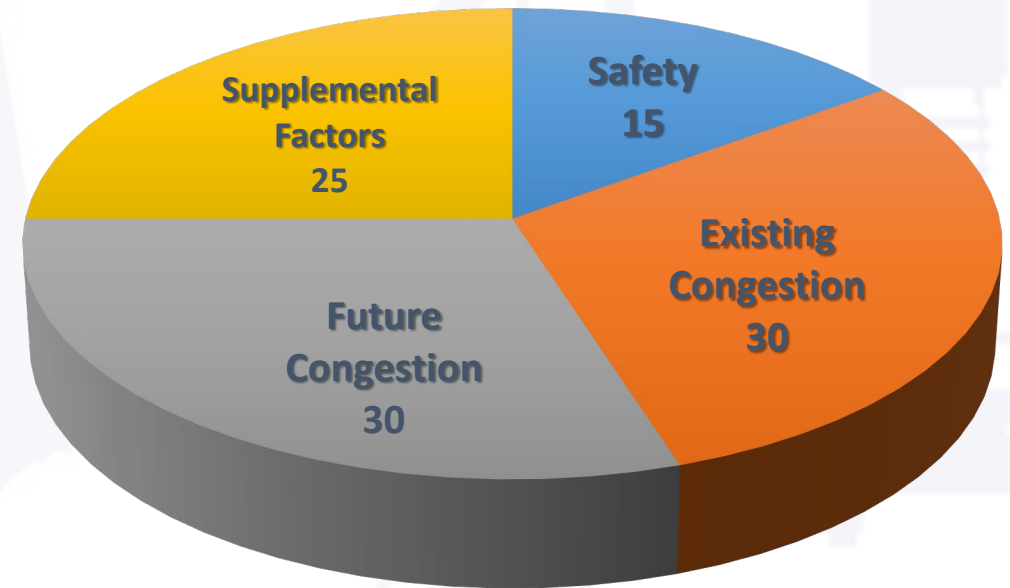
Project Scoring - Mobility

Mobility

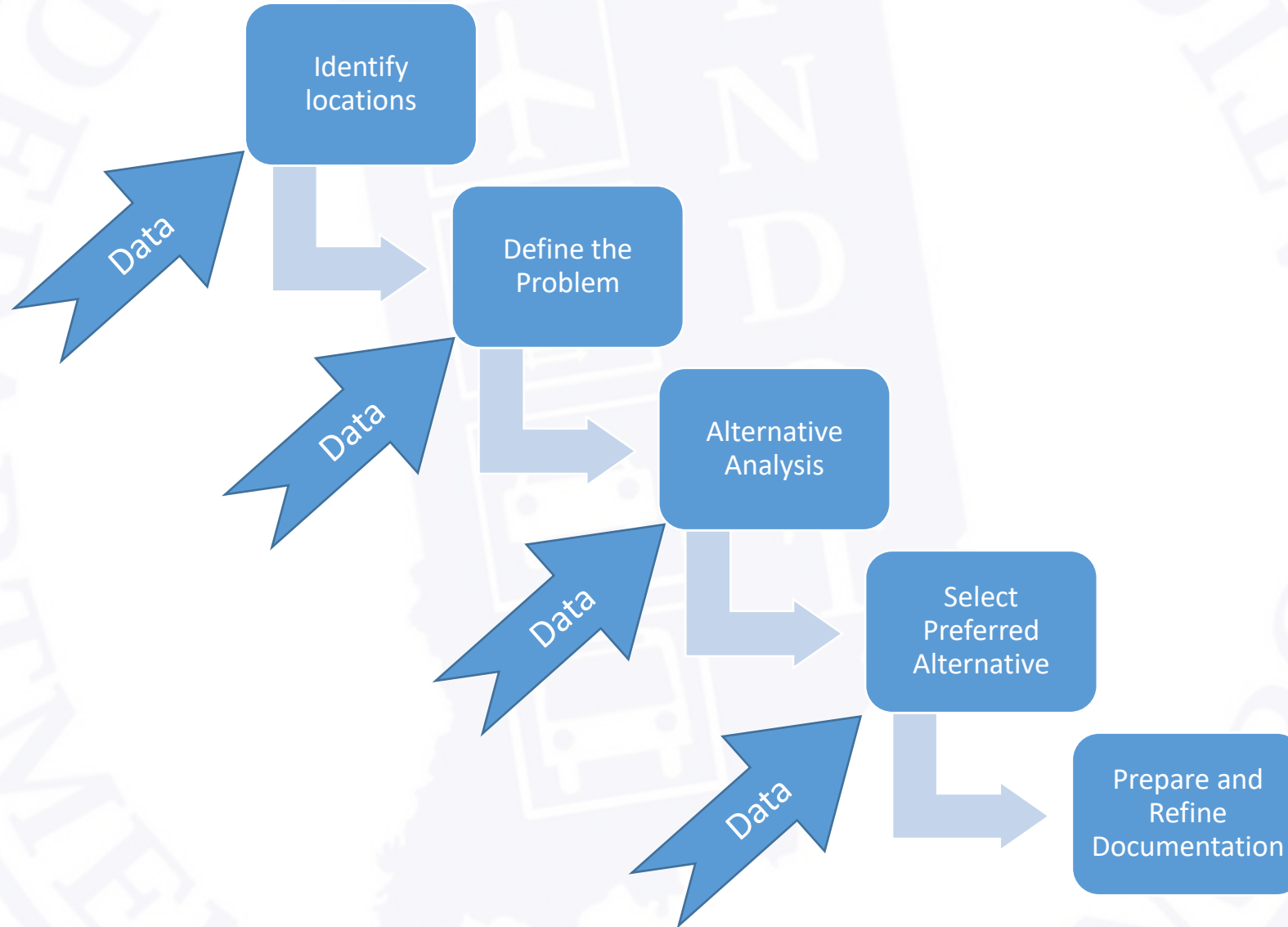
- Its all about reducing congestion
- Existing and projected poor level of service
- Supplemental Factors
 - Roadway Classification
 - Local Support
 - Multimodal & Access Control
- 0 to 100 scoring scale



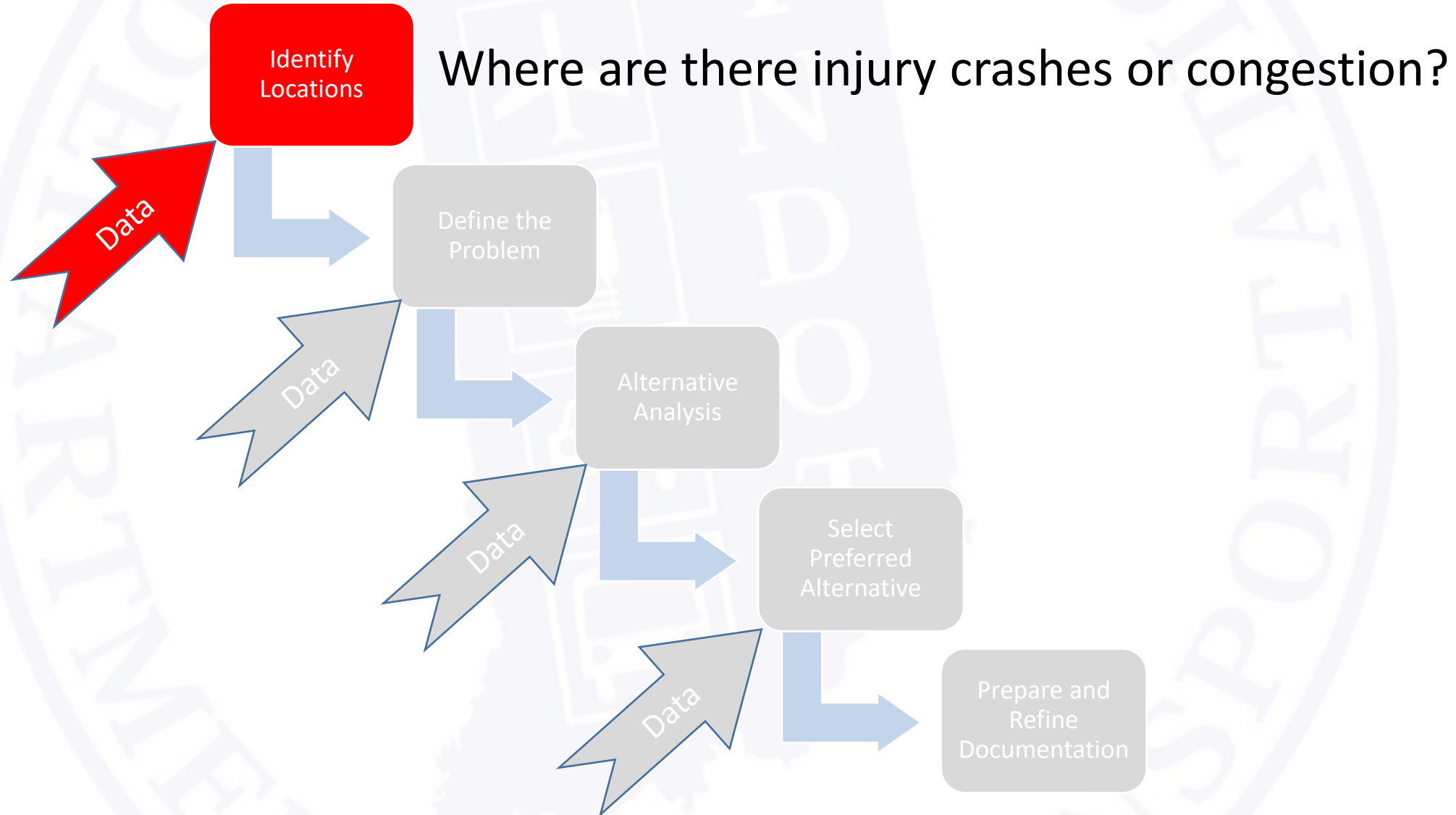
Scoring Factors



Planning Process – For Traffic Projects



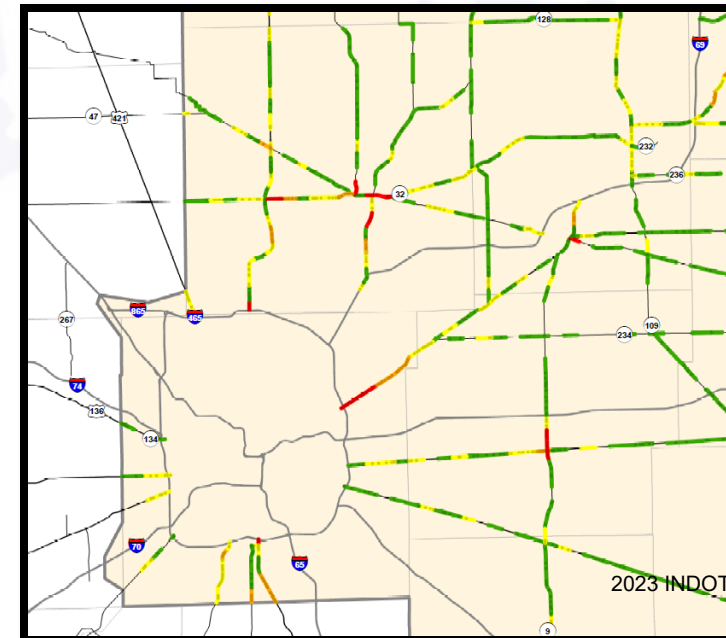
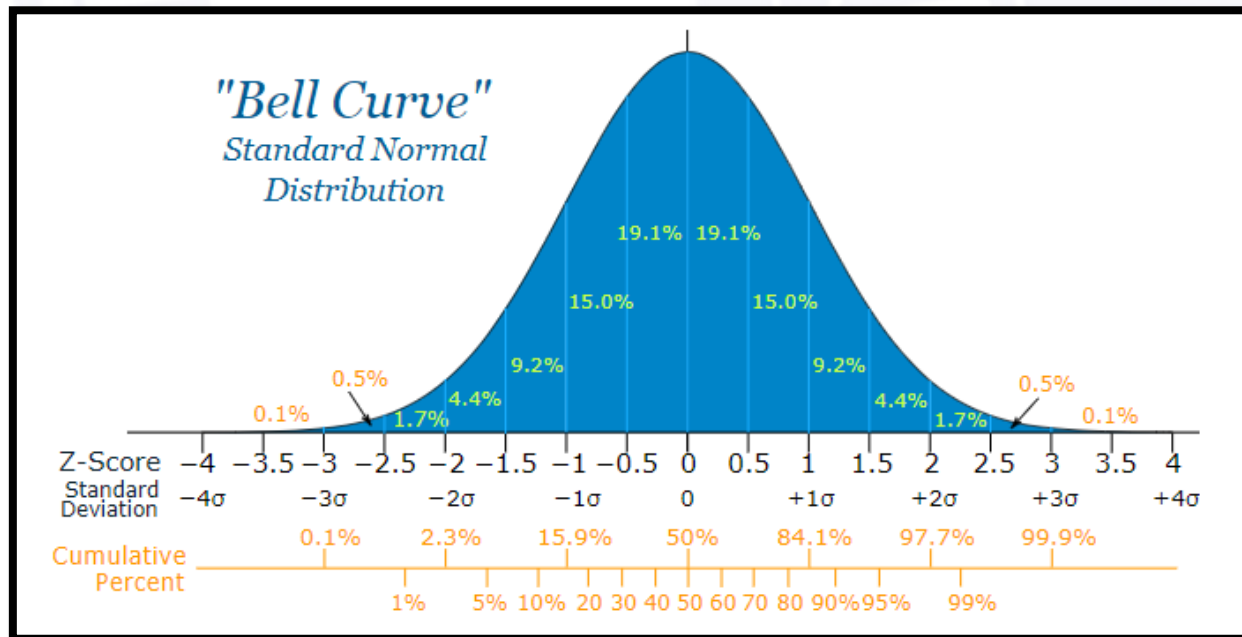
Identify the Need



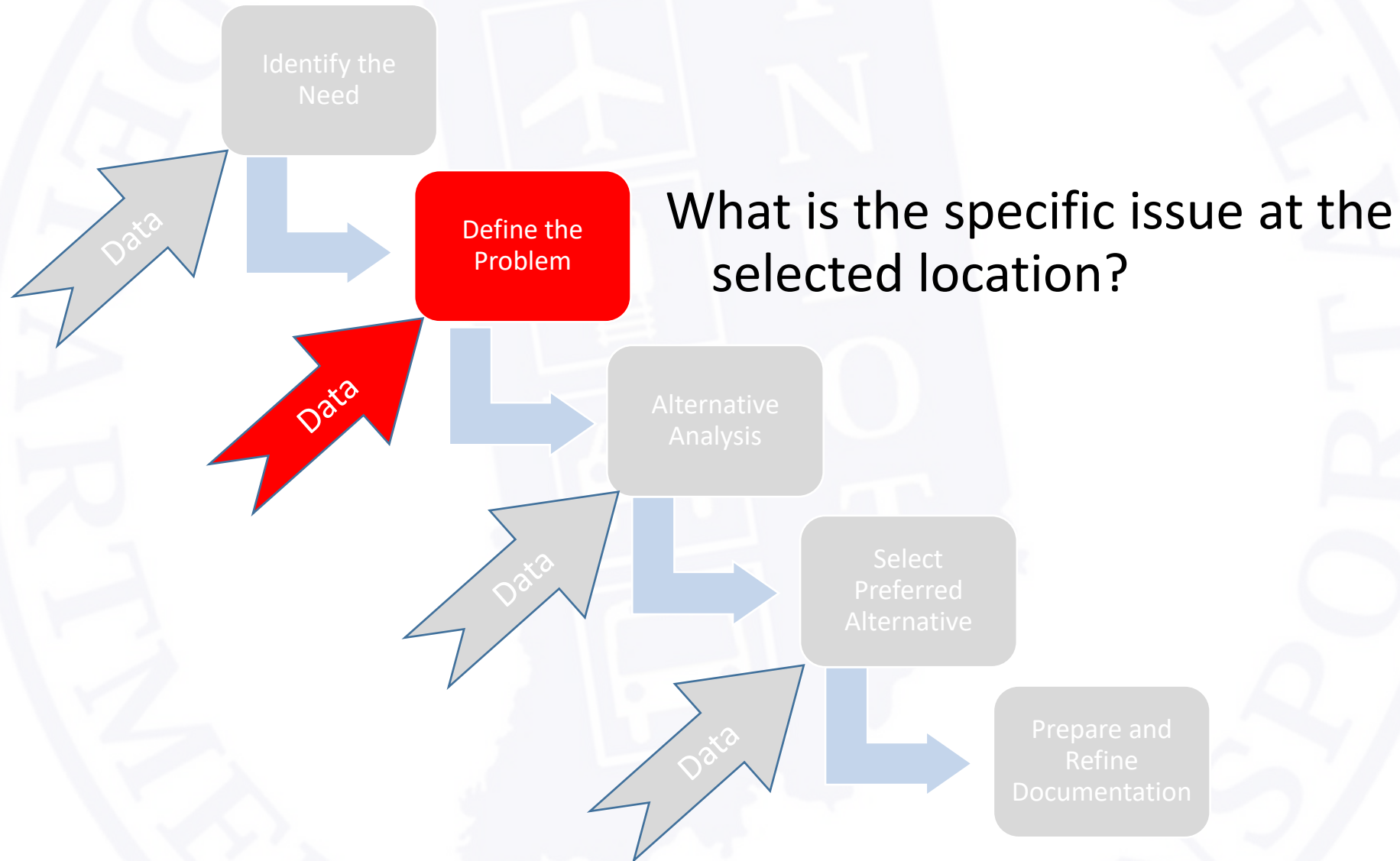
Identify the Need

- Determine where the issues are
 - Higher than normal number of crashes
 - Crashes more severe than expected
 - Recurring congestion

- Uses many forms of data collection
 - Network Screening List
 - Crash Type Heat Maps
 - Customer Complaints
 - AADT/Traffic Counts Analysis
 - Network Speeds Analysis



Define the Problem



Define the Problem

- What are we trying to solve?

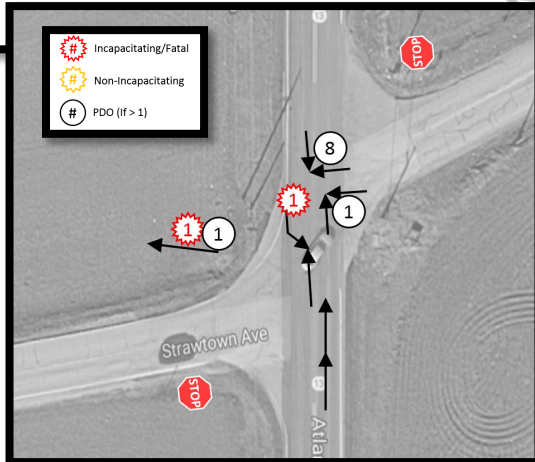
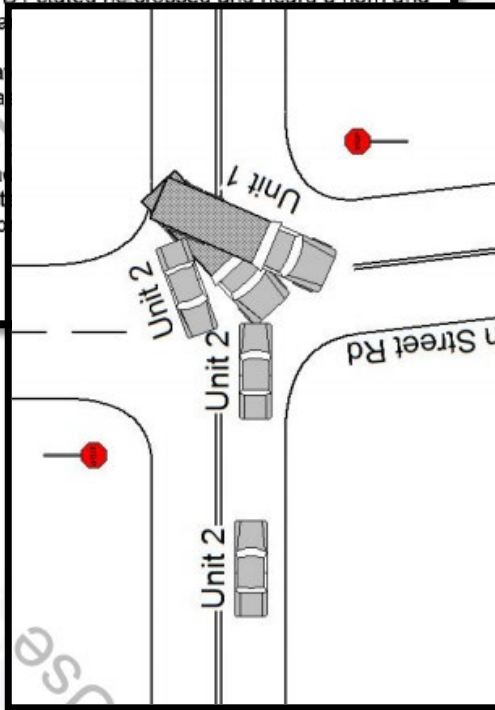
Crash Pattern

Narrative

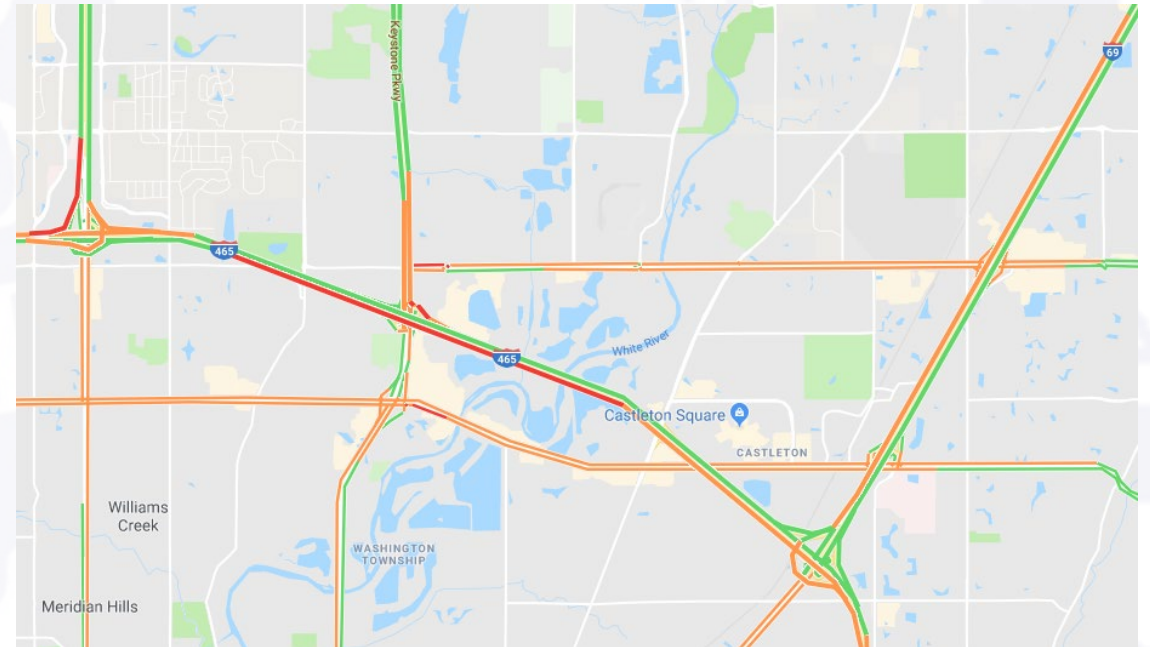
Driver 1 operating Vehicle 1 was traveling westbound on 8th Street. D1 stated he stopped at the stop sign and looked both ways and did not see anything but the sun was in his eyes. D1 stated he crossed and heard a horn and then a bang. V1 was struck in the front right by V2. D1 was not injured and V1 sustained minor damage to the front right of the vehicle.

Driver 2 operating Vehicle 2 was traveling southbound on SR 13. D2 stated he was hit by V1. V2 was struck in the left side of V2. D2 was injured and V2 sustained damage.

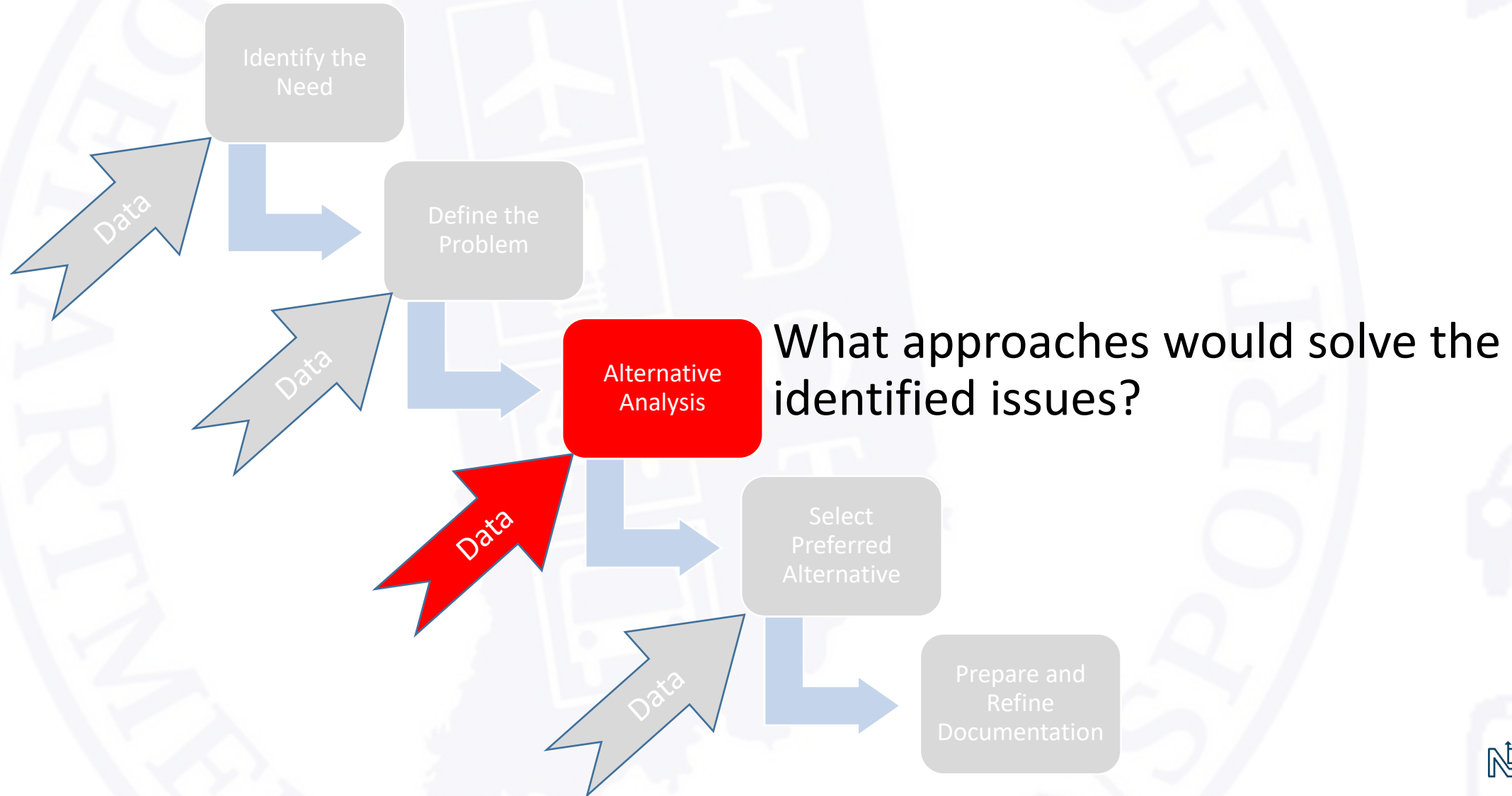
Passenger 1 was seated behind D2. P1 stated she was on bike and car. Witness 1 was traveling westbound directly behind V1. W1 stated V1 had stopped at the stop sign. W1 stated V1 started pulling away and right as V1 started to miss V1. W1 stated V2 ended up sliding and saw P1 lying face down on the road southbound on SR 13.



Congestion



Alternative Analysis



Alternative Analysis

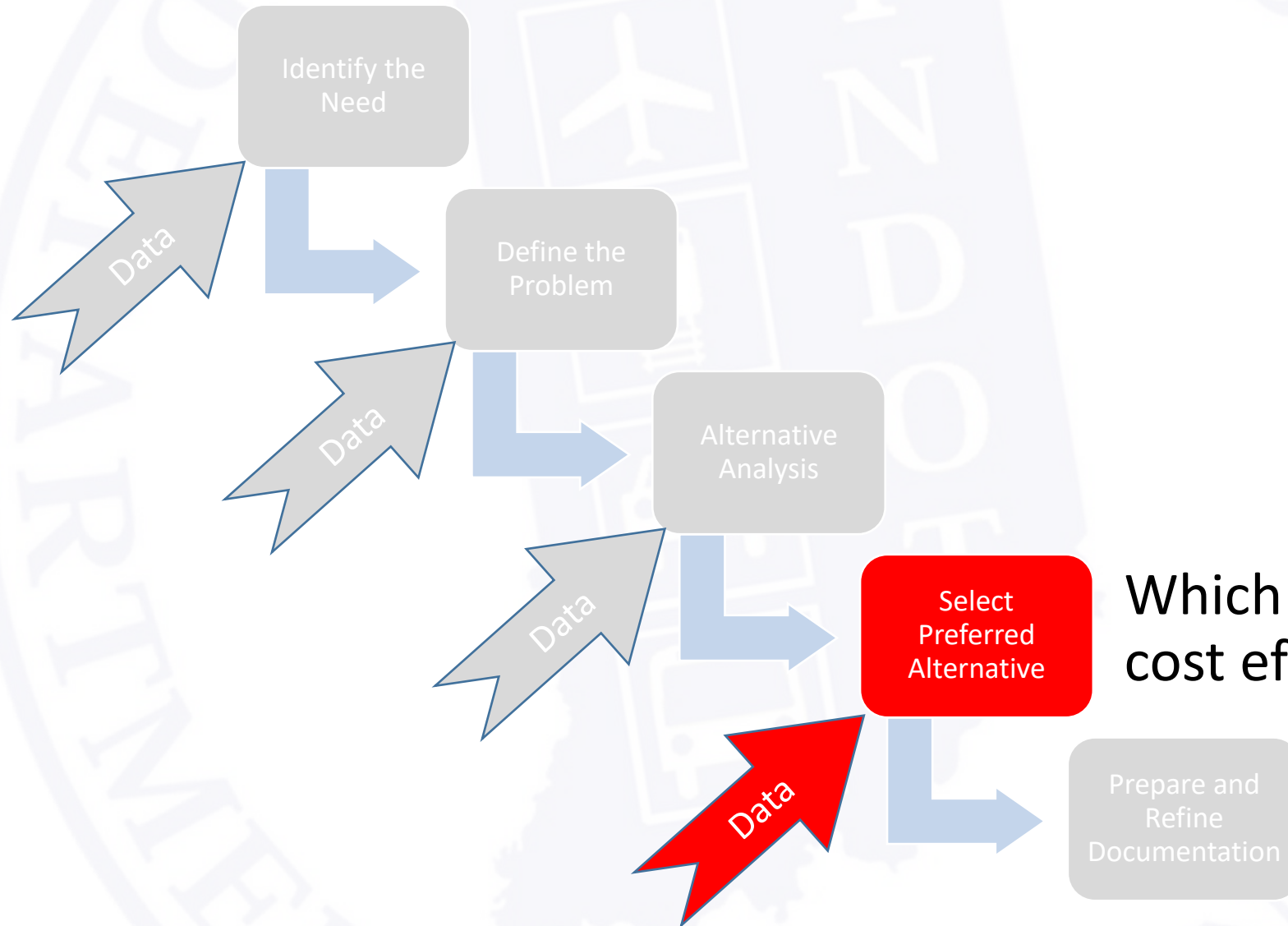
- Determine best options to address the problem
- Evaluate different funding options
- Evaluate each alternative
 - How well will it solve the problem
 - How much will it cost
 - Is it feasible
 - Will it SCORE well

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘			↗			↘
Traffic Vol, veh/h	45	381	42	21	208	23	0	0	122	0	0	144
Future Vol, veh/h	45	381	42	21	208	23	0	0	122	0	0	144
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	250	250	-	250	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	62	523	58	29	285	32	0	0	133	0	0	157

USER INPUT	
Countermeasure: Raised Median and Signal Modifications	
Crashes (Total of 3 years only)	
Location Type	Urban Multilane Highway
Fatal and Incapacitating Injury Crashes	47
Non-Incapacitating Injury Crashes	36
PDO Crashes	206
Crash Reduction Factors (% , By Severity)	
CRF _{KA} (Killed or Incapacitating Injury)	39
CRF _{BC} (Injury or Possible Injury)	39
CRF _O (Property Damage Only)	39
Project Information	
Current Year	2018
Project Build Year	2024
Inflation Rate (% , Do Not Change)	2
Project Life (Years, Default Value is 20)	20
Traffic Growth (% , Not Greater than 1.5)	1
Yearly Upkeep Costs (Today's Dollars)	\$15,000
Total Project Cost (Today's Dollars)	\$5,790,000

RESULTS
Initial Annual Crash Costs \$9,154,427
Initial Annual Crash Costs Reduction \$3,570,226
Total Lifetime Crash Costs Reduction \$78,312,828
Build Year Project Cost \$6,520,480
Benefit Cost Ratio 12.01

Select Preferred Alternative



Which alternative is the most cost effective?

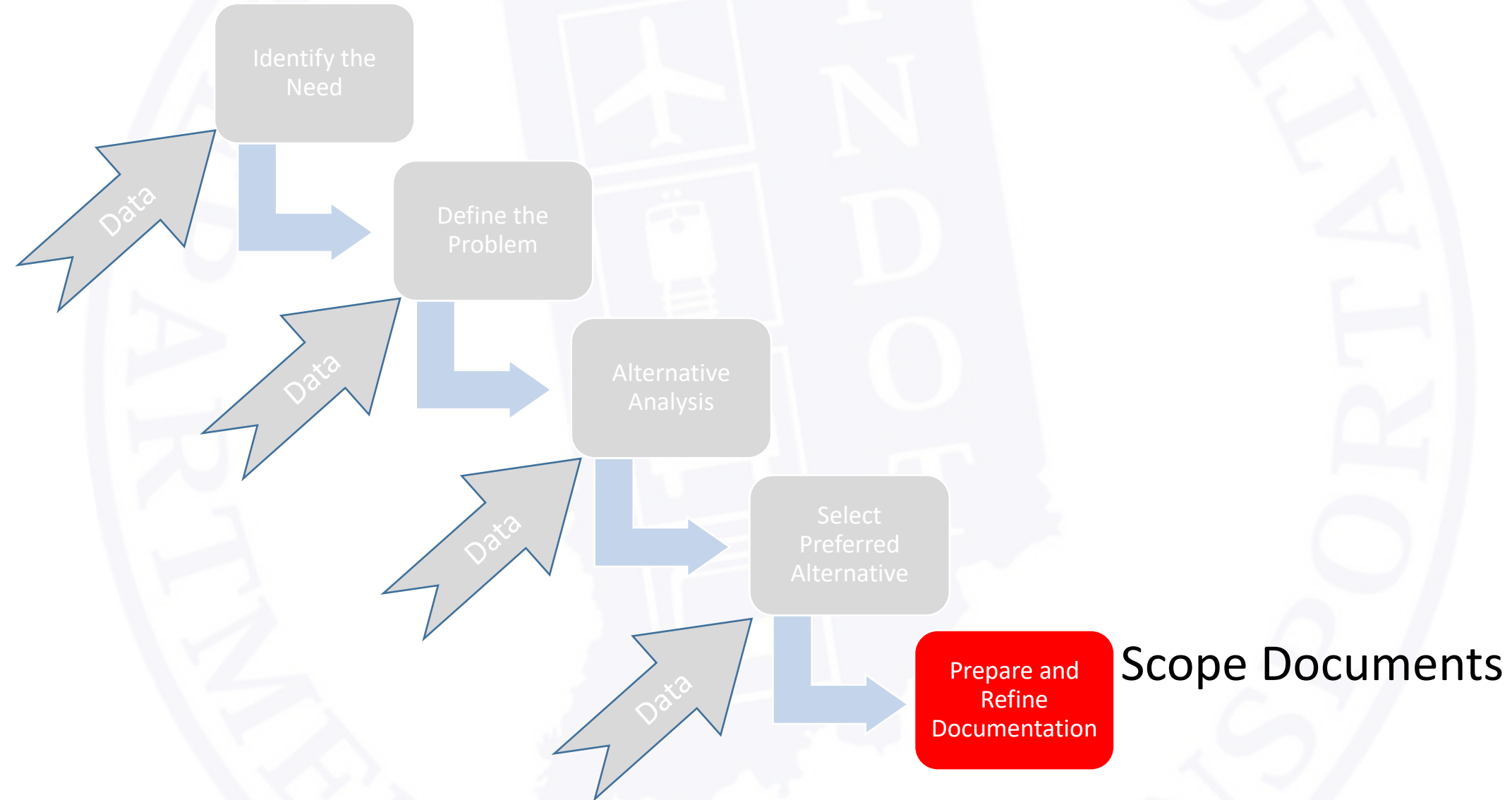
Select Preferred Alternative

- Use data to compare alternatives
- Select alternative that best solves the problem while still being feasible/fundable

SR 37 & 186th St – 2023 Construction



Prepare and Refine Documentation



Prepare and Refine Documentation

- **Collect information that may impact design:**

- Right of Way
- Utilities and Railroad
- Hydraulic Concerns
- Environmental and Historic
- Adjacent Projects
- Community Outreach
- Maintenance of Traffic

- **Finalize documentation**

- Project Score
- Cost Estimate
- Sketch
- Capacity Analysis
- Project Scope Document

- **Submit for a Project**

- Work Orders
- Incorporation into existing project
- Submit a call project



Submit for a Project

- **Work order through traffic maintenance**

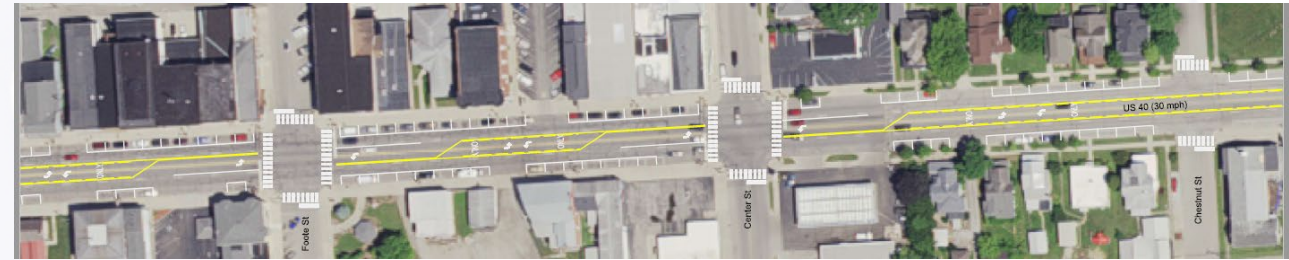
- Minor traffic asset modifications
- Typically, within 8 weeks
- Low cost, localized impact, good value for customers

- **Incorporation into existing project**

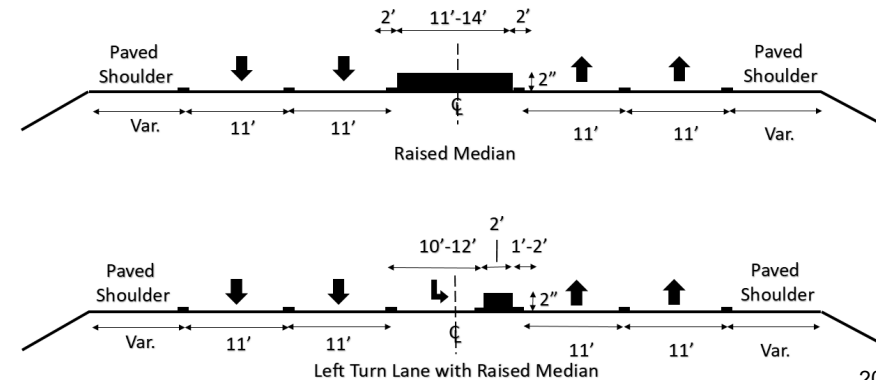
- Scope and Plan review
- Typically, within 2 years
- Discounted cost, targeted impact, excellent value for customers

- **Call and Deliberation**

- Full project package
- 5 Year project development
- High cost, high impact, good value for customers



US 36 – Proposed Raised Median
Typical Cross Sections



QUESTIONS?

