NHTSA

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

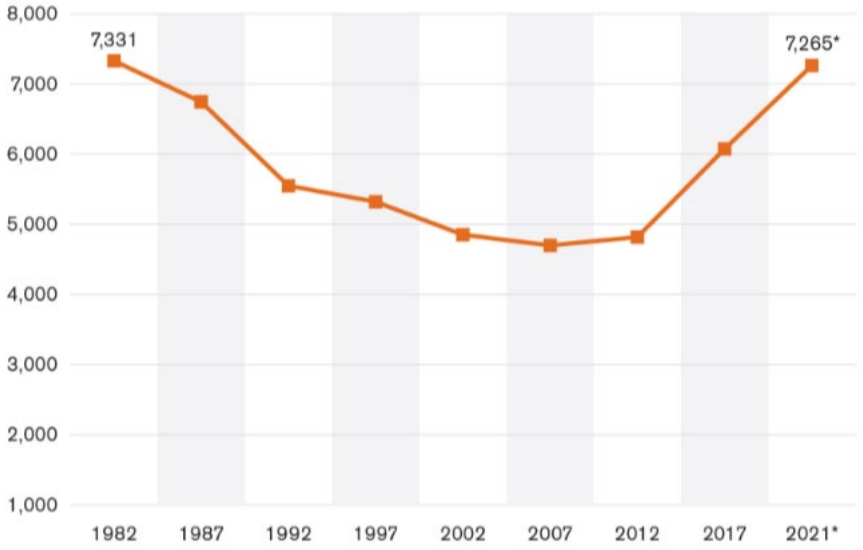
An Update on the Vulnerable Road User In-Depth Crash Investigation Study

Jack Lockerby, Mechanical Engineer

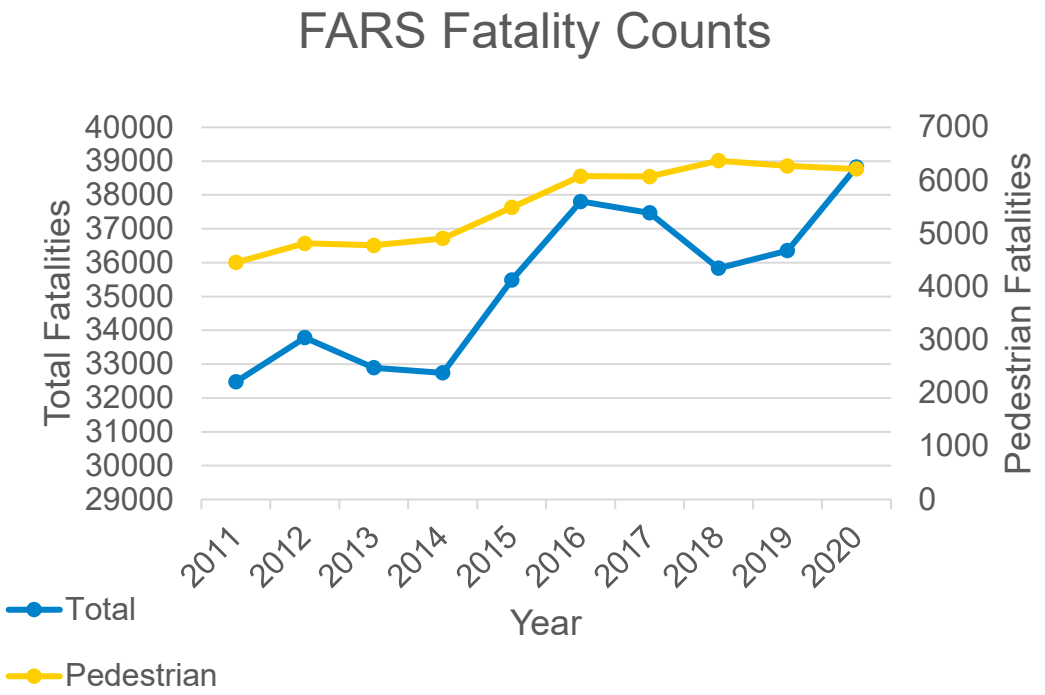
NHTSA

Motivation

- Pedestrian fatalities have been increasing
- Lack of modern in-depth pedestrian crash data
- Various research needs across NHTSA



Source: Governors Highway Safety Administration



VICIS Study

Vulnerable Road User In-depth Crash Investigation Study (VICIS)

Sacramento County, CA

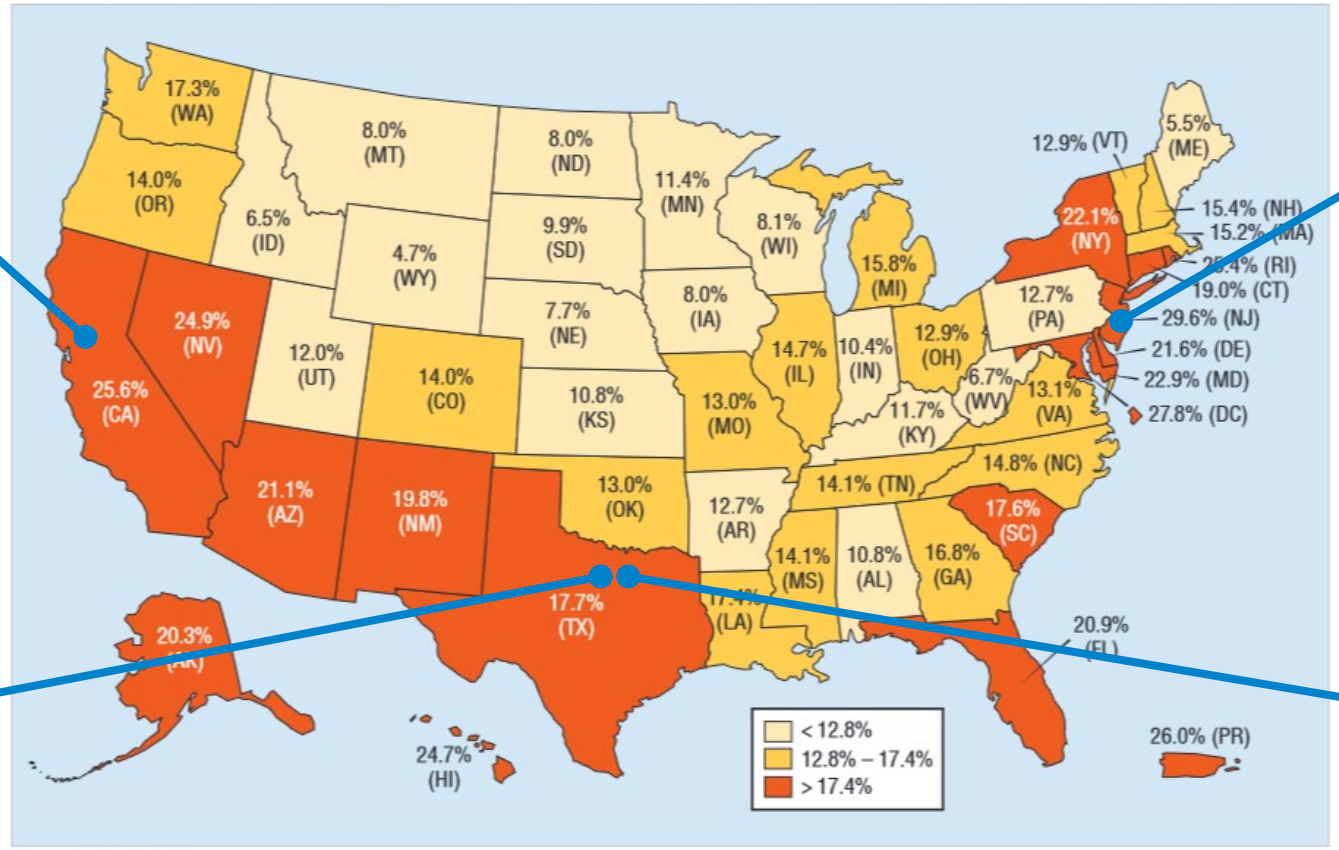
Tarrant County, TX

Atlantic County, NJ

Dallas County, TX

Figure 3

Percentage of Total Fatalities Who Were Pedestrians, by State, 2020

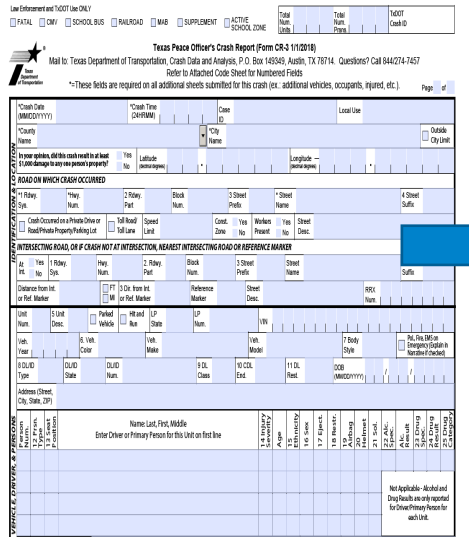


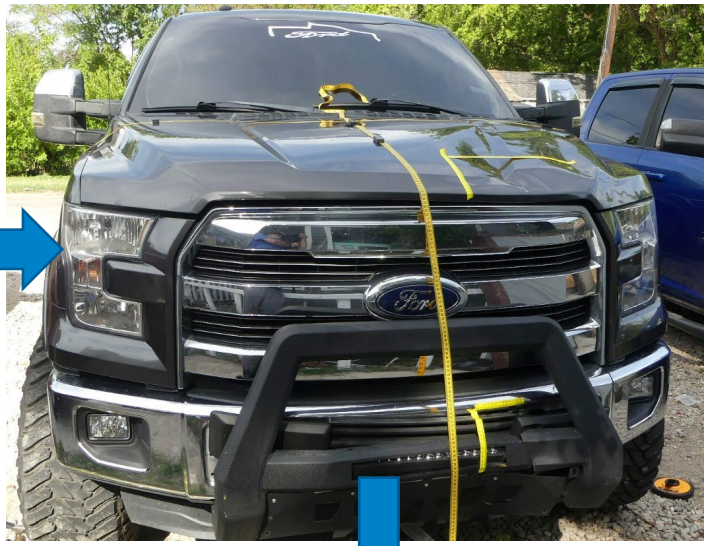
Source: FARS 2020 ARF

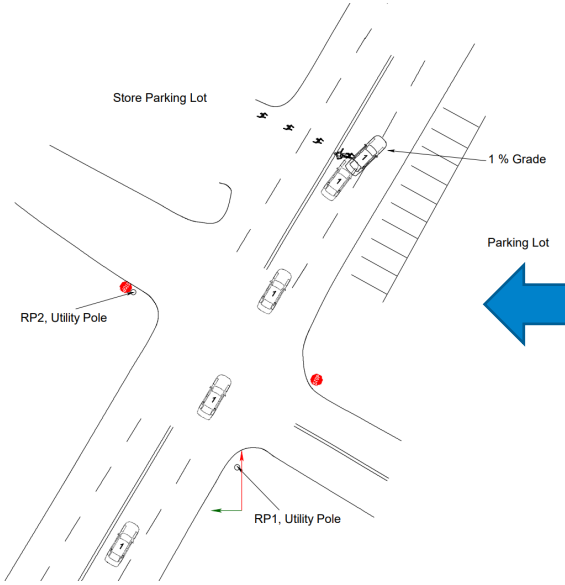
VICIS Study

- Inclusion criteria:
  - Only pedestrians (no bikes, scooters, or conveyances)
  - Struck by vehicle moving forward
  - Vehicle inspection or photos of contact damage required

- No Sampling – PSUs screen local police crash reports and select cases


Texas Peace Officer's Crash Report (Form CR-3 1/1/2018)

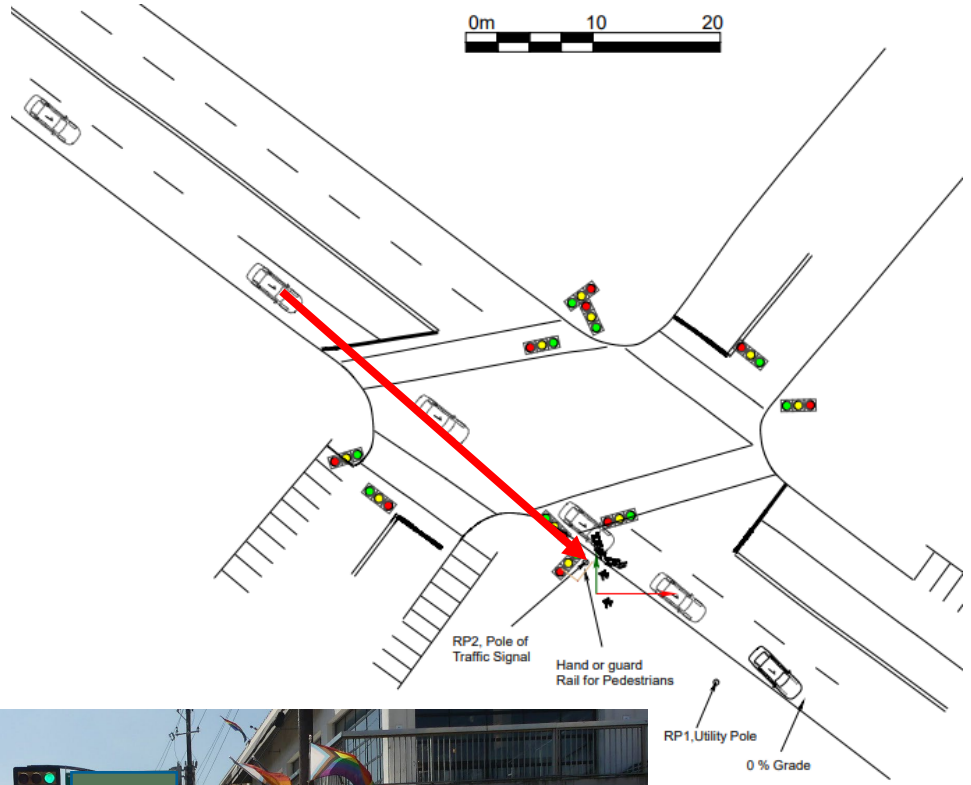


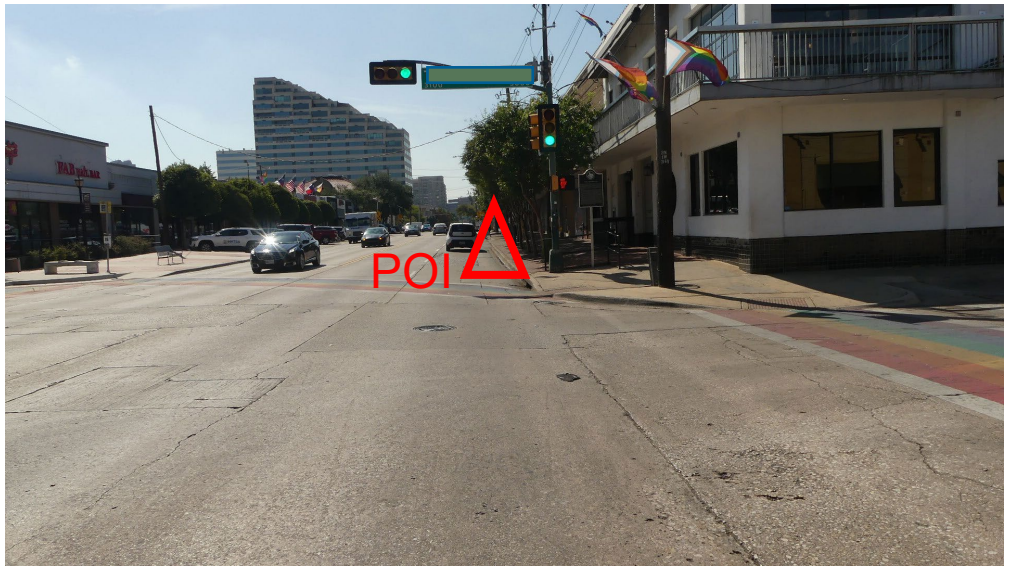


Data Collection

1. Crash Avoidance
   - Pre-crash scenarios and sightlines
   - Speed and trajectory of vehicle and pedestrian
   - Environment, weather, and lighting

2. Crashworthiness
   - Vehicle inspections/photos documenting contacts
   - Pedestrian injuries from medical records





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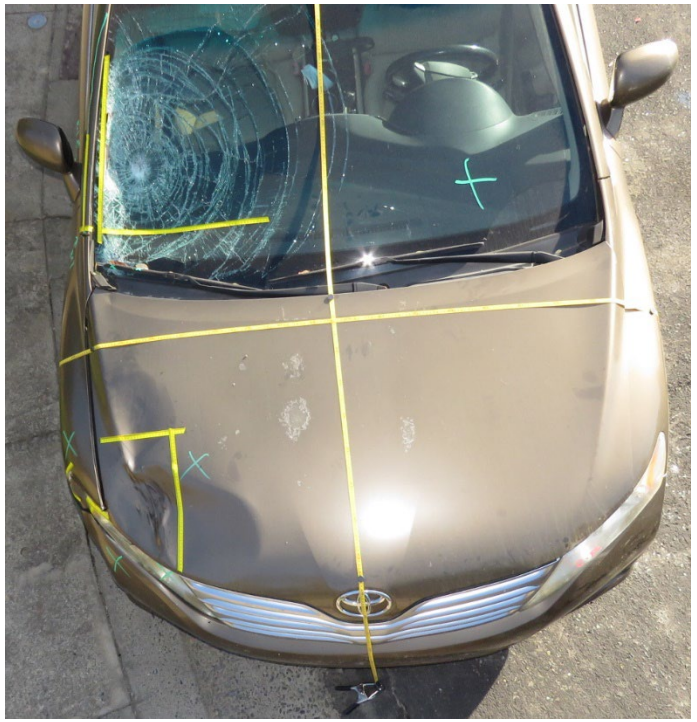
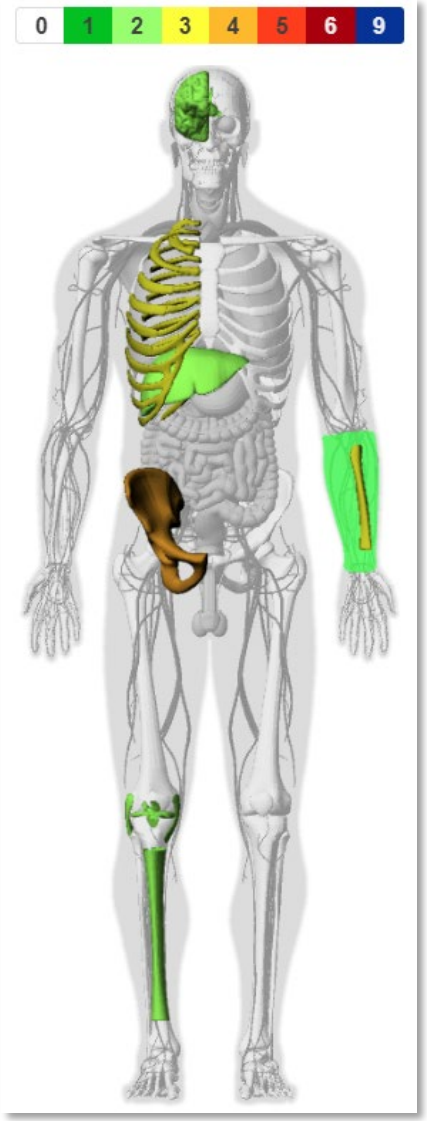




Data Collection

3. Infrastructure
   - Roadway features
   - Pedestrian facilities and warnings
   - Streetlighting

4. Human Behavior
   - Detailed interview forms for driver and pedestrian
   - Distractions, impairment, trip purpose, risk-taking behavior

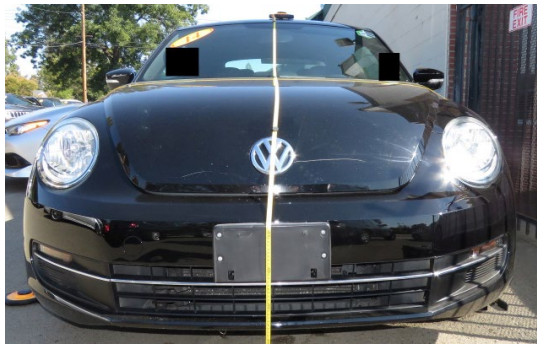
Driver Condition	
32. Before the crash, how were you feeling?	☒ Normal ☐ Other, specify _____
33. Do you think your mental status was clear leading up to the crash?	☒ Yes ☐ No, specify _____
34. Were you feeling rushed?	☐ Yes ☒ No
35. Would you say you are well rested or a little tired at the time of the crash?	☐ Very tired ☐ Somewhat tired Did not want to answer ☐ Well rested
36. Did you have alcohol or another drug (over-the-counter, prescription, or other) within 12 hours of the crash?	☐ Yes ☒ No
36a. Did you feel impaired by any substance? *Select all that apply.*	☒ No ☐ Alcohol ☐ Prescription Drugs, specify _____ ☐ Other, specify _____
37. Before the crash, did anything distract you? *Select all that apply.* NO	☐ Talking on cell phone ☐ Another person in car ☐ Moving object in car ☐ Something outside the car, Specify _____ ☐ Sleeping or dozing ☐ Other, Specify _____ ☐ Not distracted
Trip Details and Behavior	
38. What was the main purpose of your driving trip on the day of the crash?	☐ Commuting to/from work ☐ Commuting to/from school ☐ Recreation ☒ Personal errands (to/from the store, post office, etc.) ☐ Drop off/pick up someone ☐ Visiting a friend or relative ☐ Other, specify: _____
39. How long have you been driving in general?	☐ Less than 1 year ☐ 1-5 years ☒ 6-10 years SO ☒ 10+ years
40. How many miles a year do you drive?	☐ Less than 5,000 ☐ 5,000-10,000 miles UNK ☐ 10,000+ miles
41. Is this the vehicle you normally drive?	☒ Yes ☐ No, Explain _____
42. How long have you been driving it?	☐ Less than a month ☐ 1-6 months ☒ 6 months to 2 years ☐ 2+ years

VICIS Cases

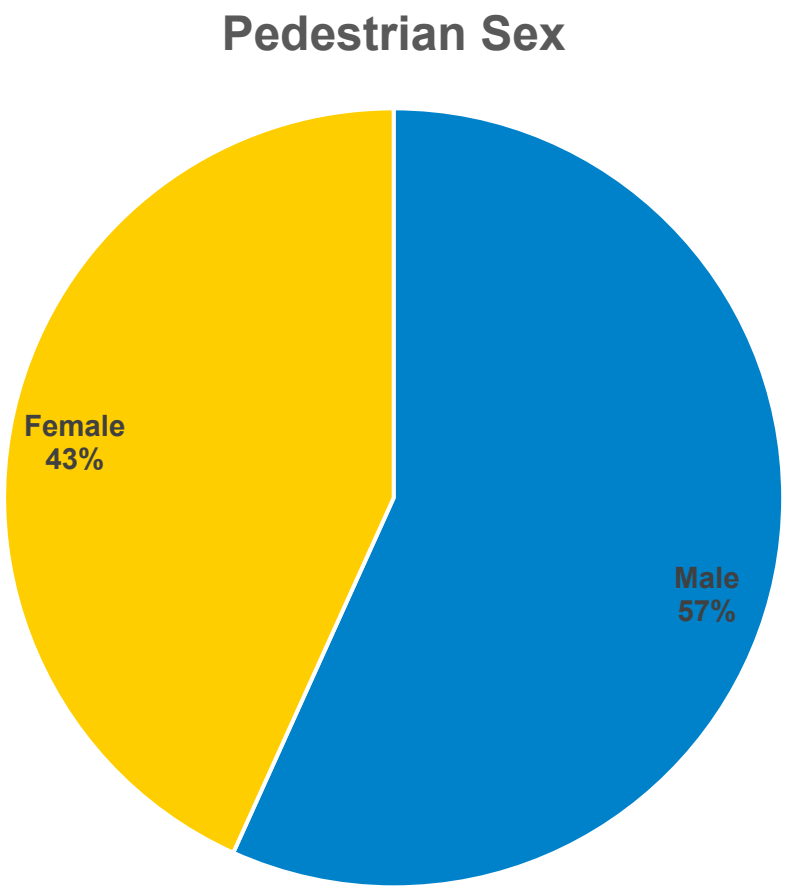
- Case enrollment for six months: July to Dec 2022
- 93 total cases collected across four sites
- PSU data entry ongoing, not all crash cases fully populated

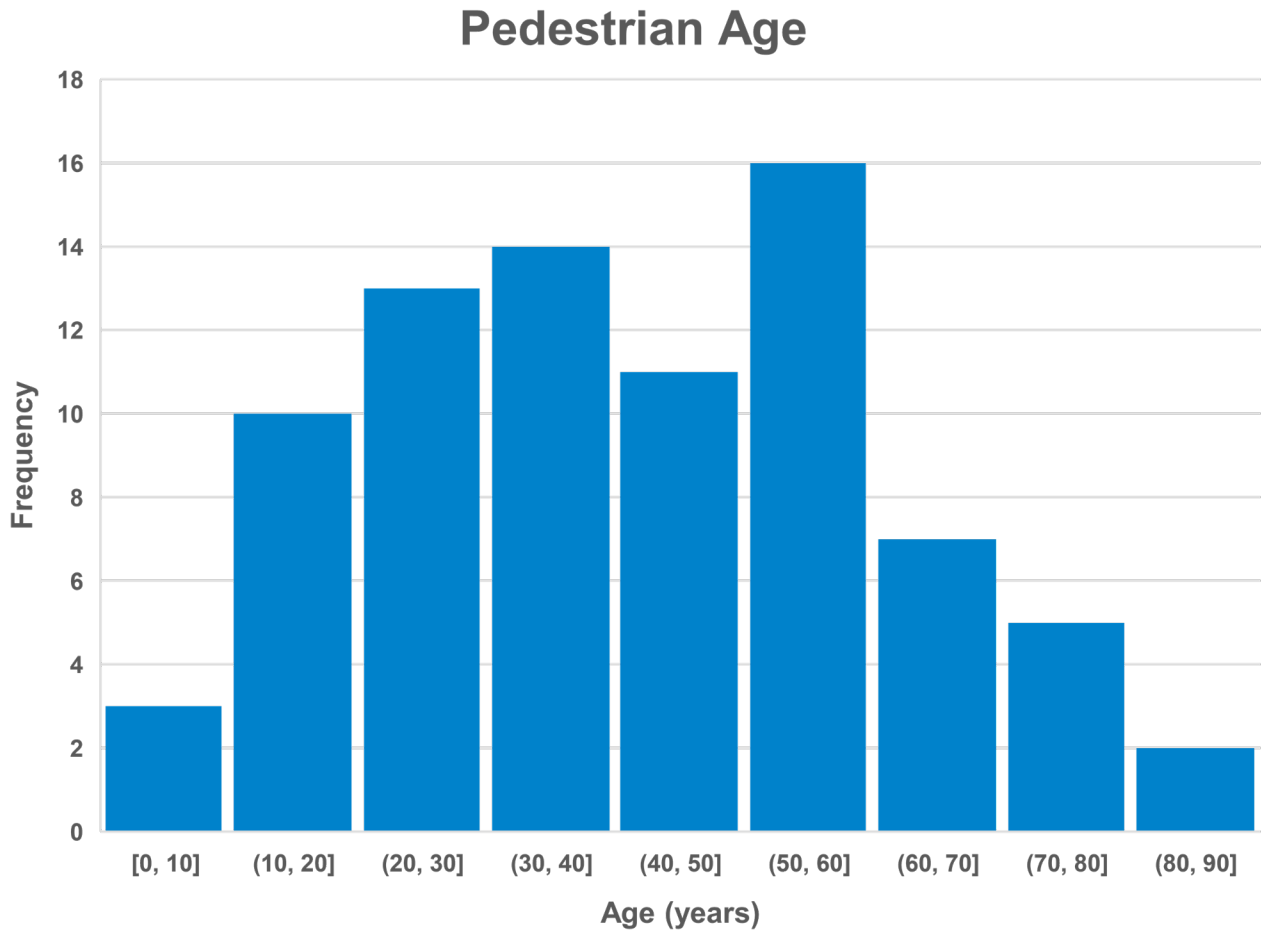






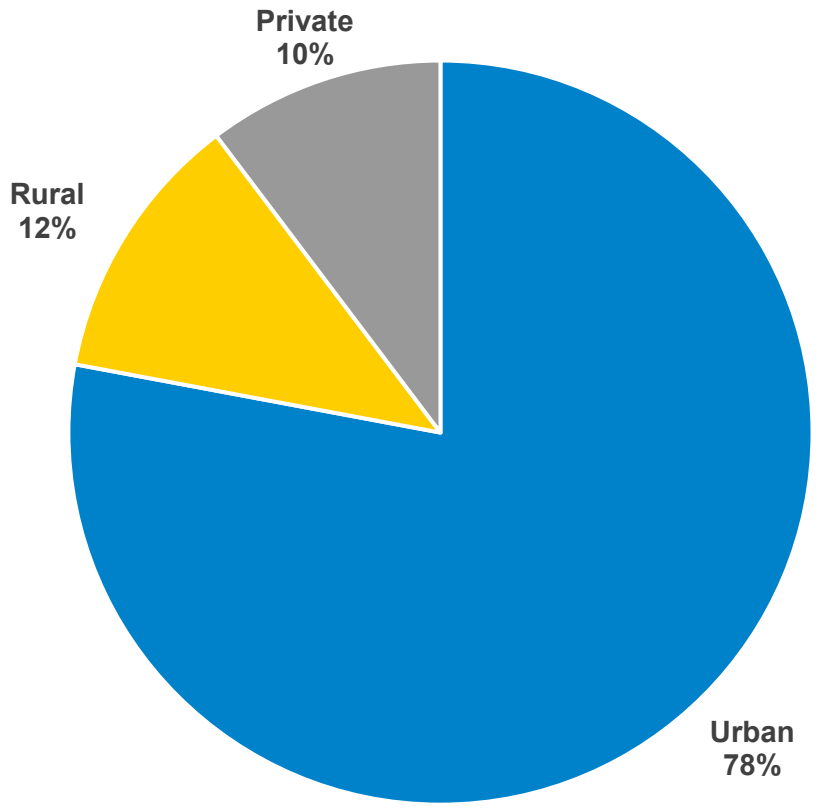

Preliminary Case Distributions



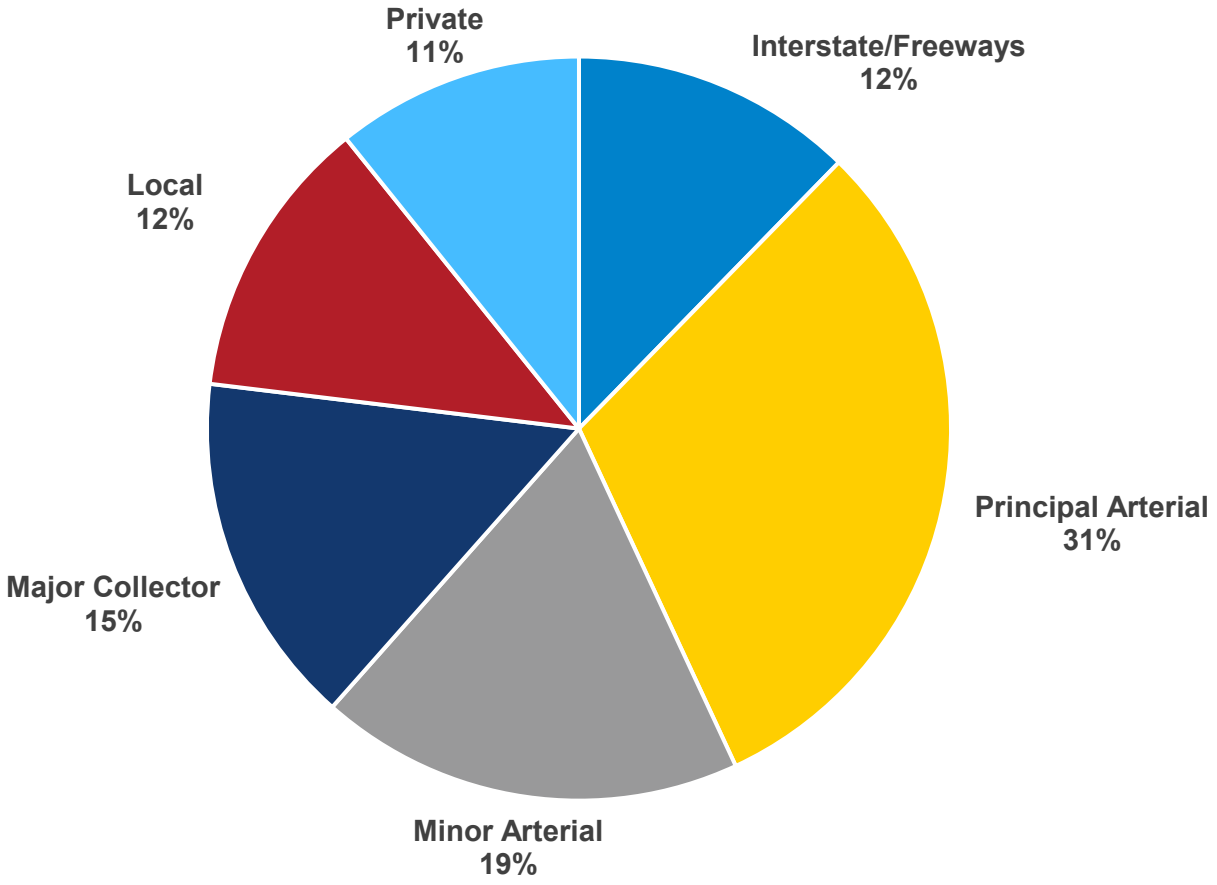


Preliminary Case Distributions

Land Use



Roadway Functional System



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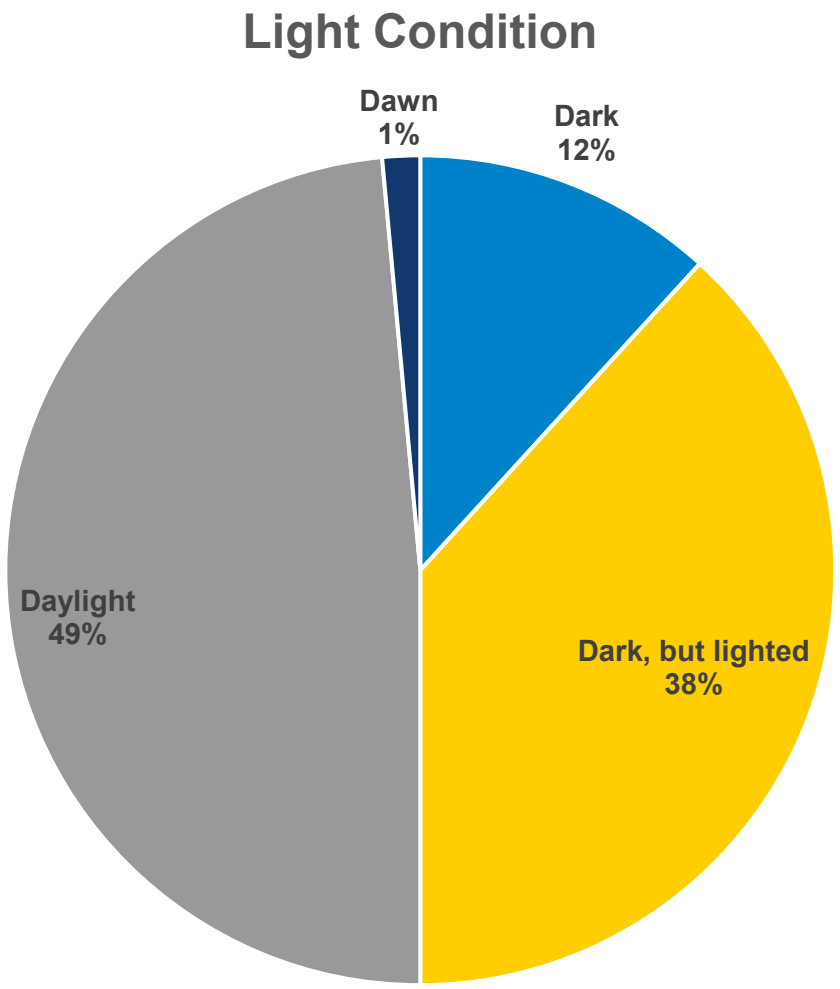

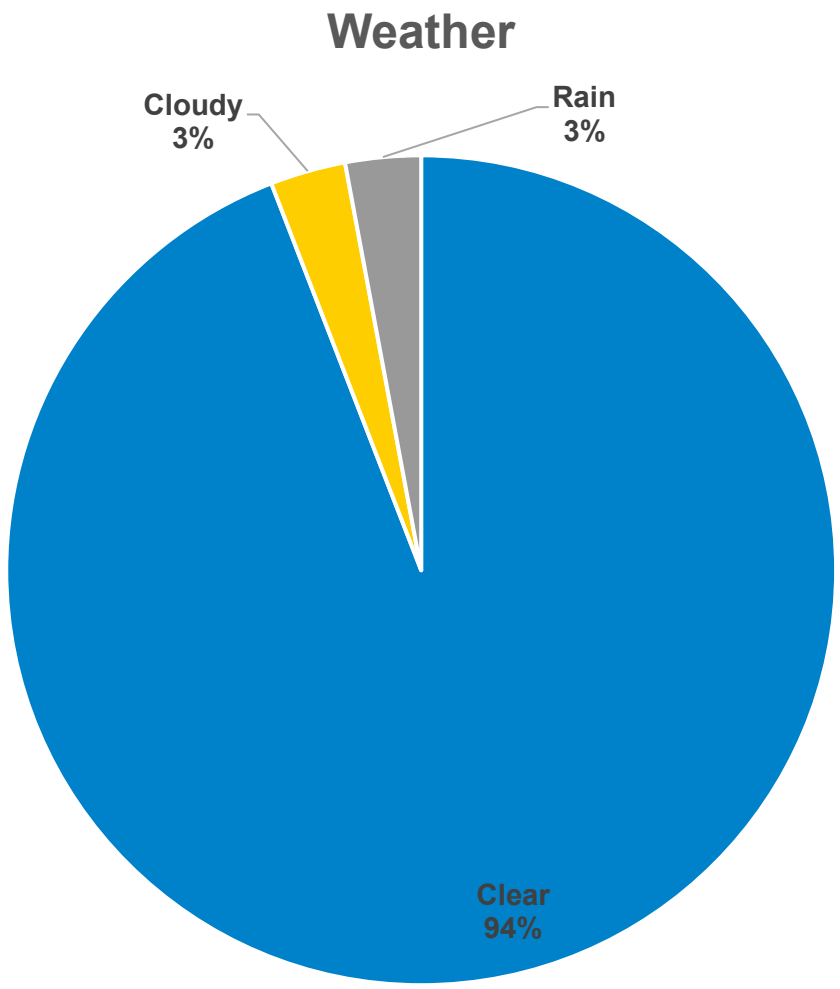

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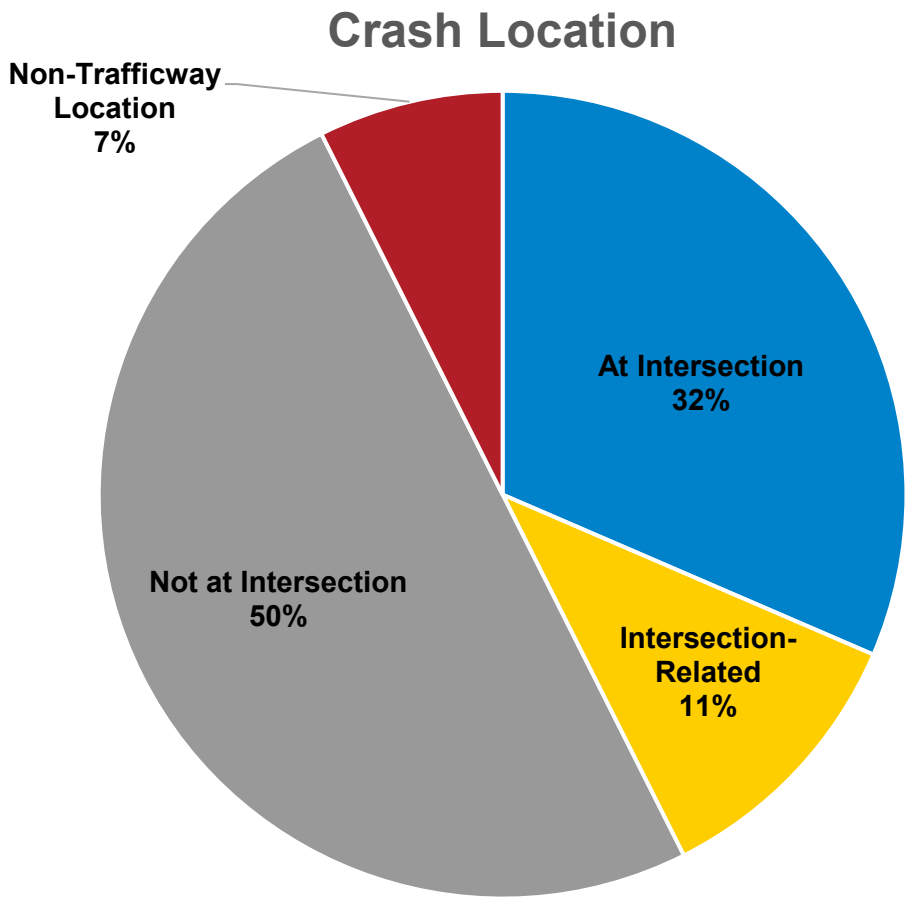

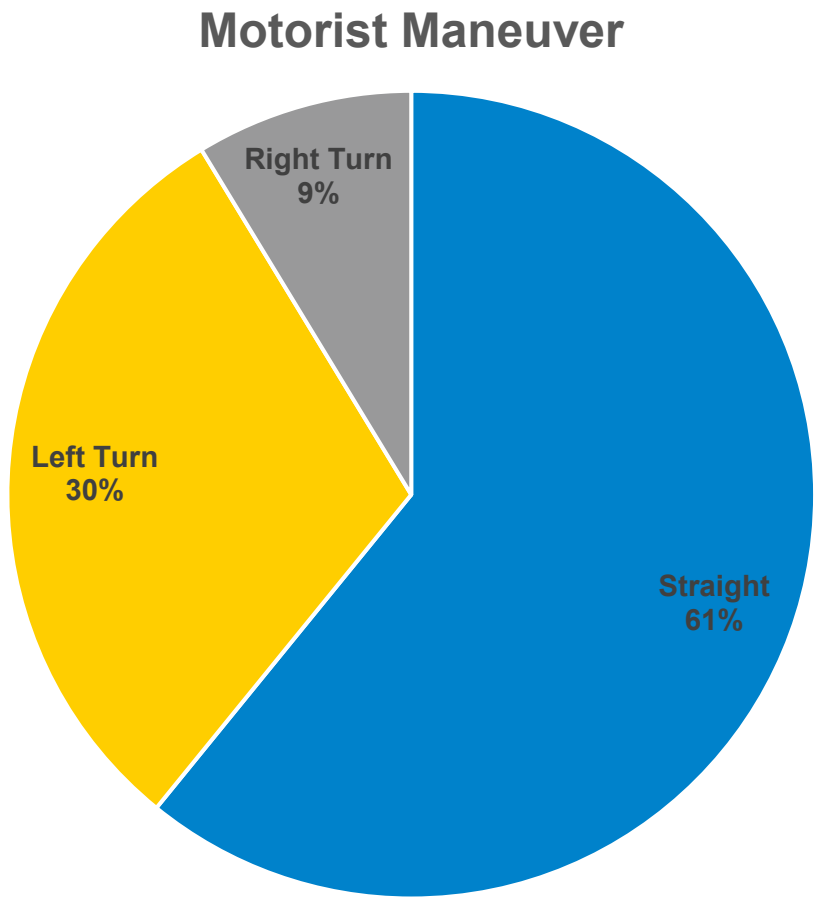

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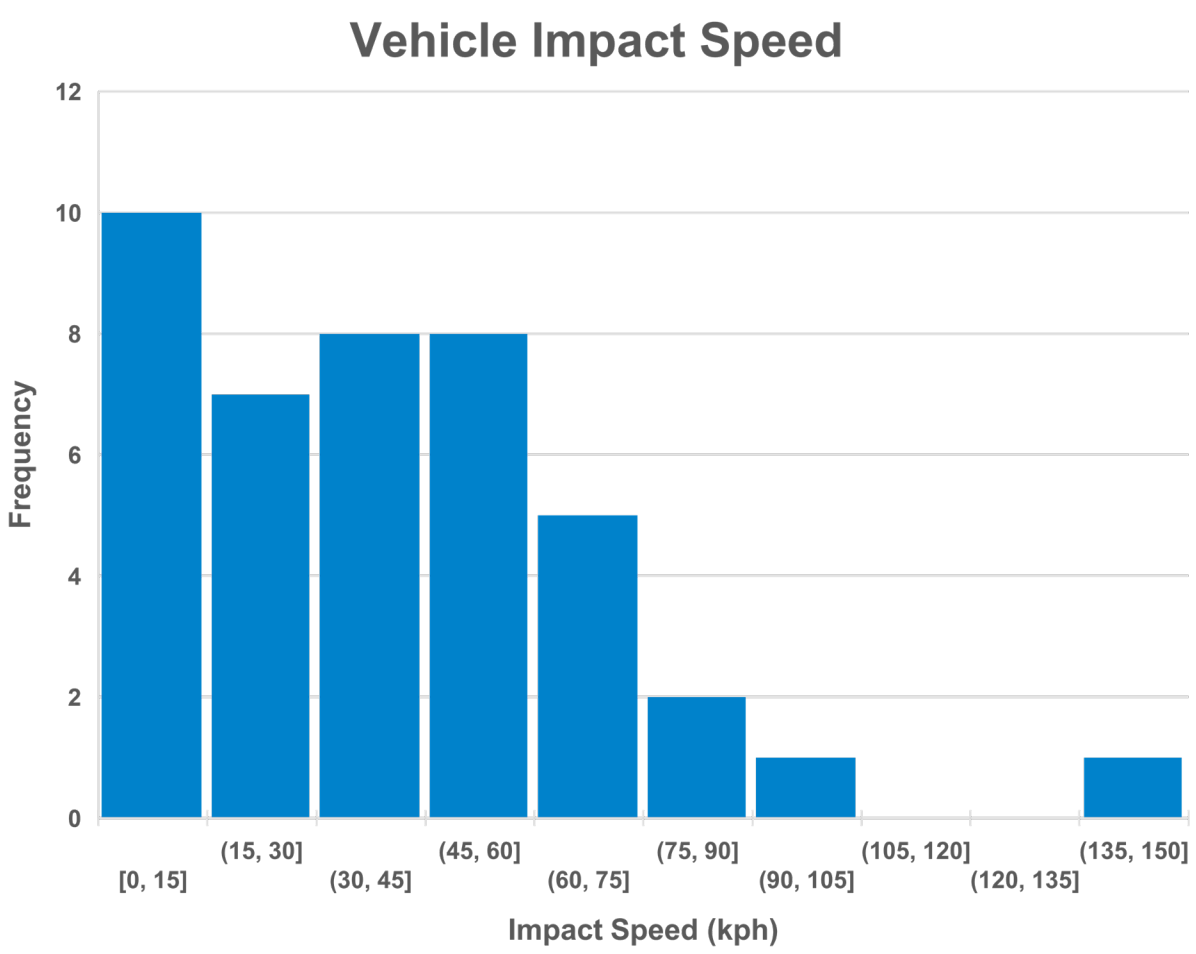

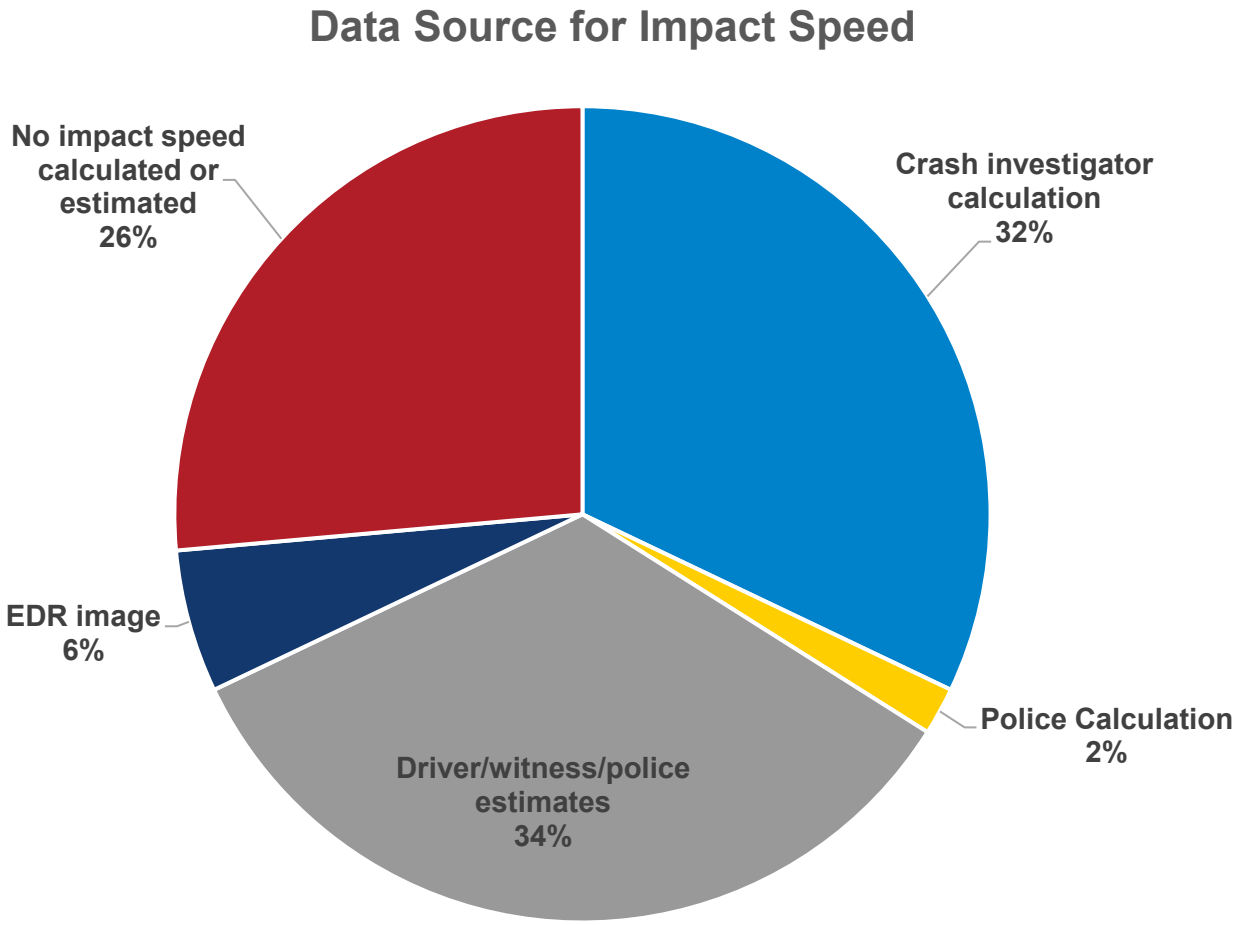

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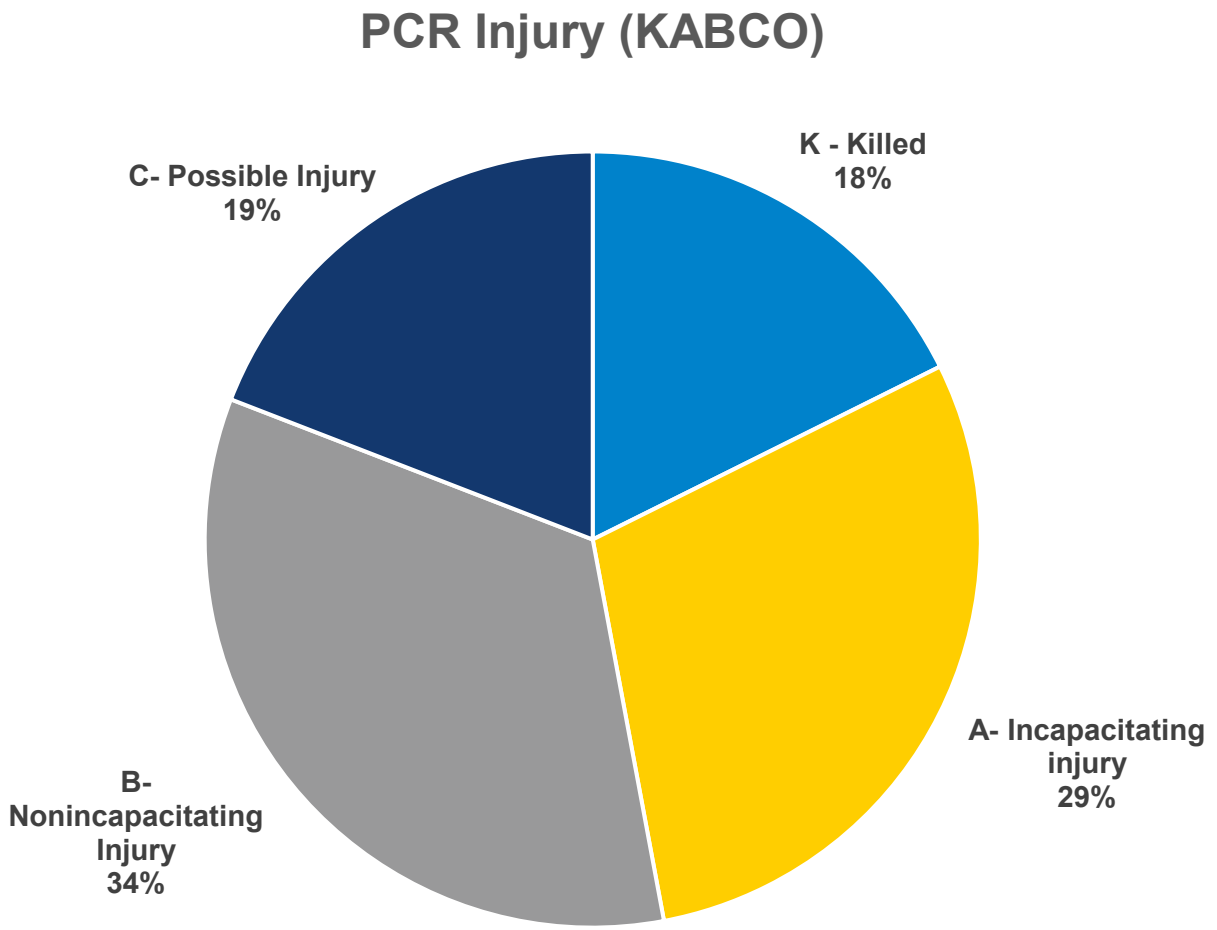

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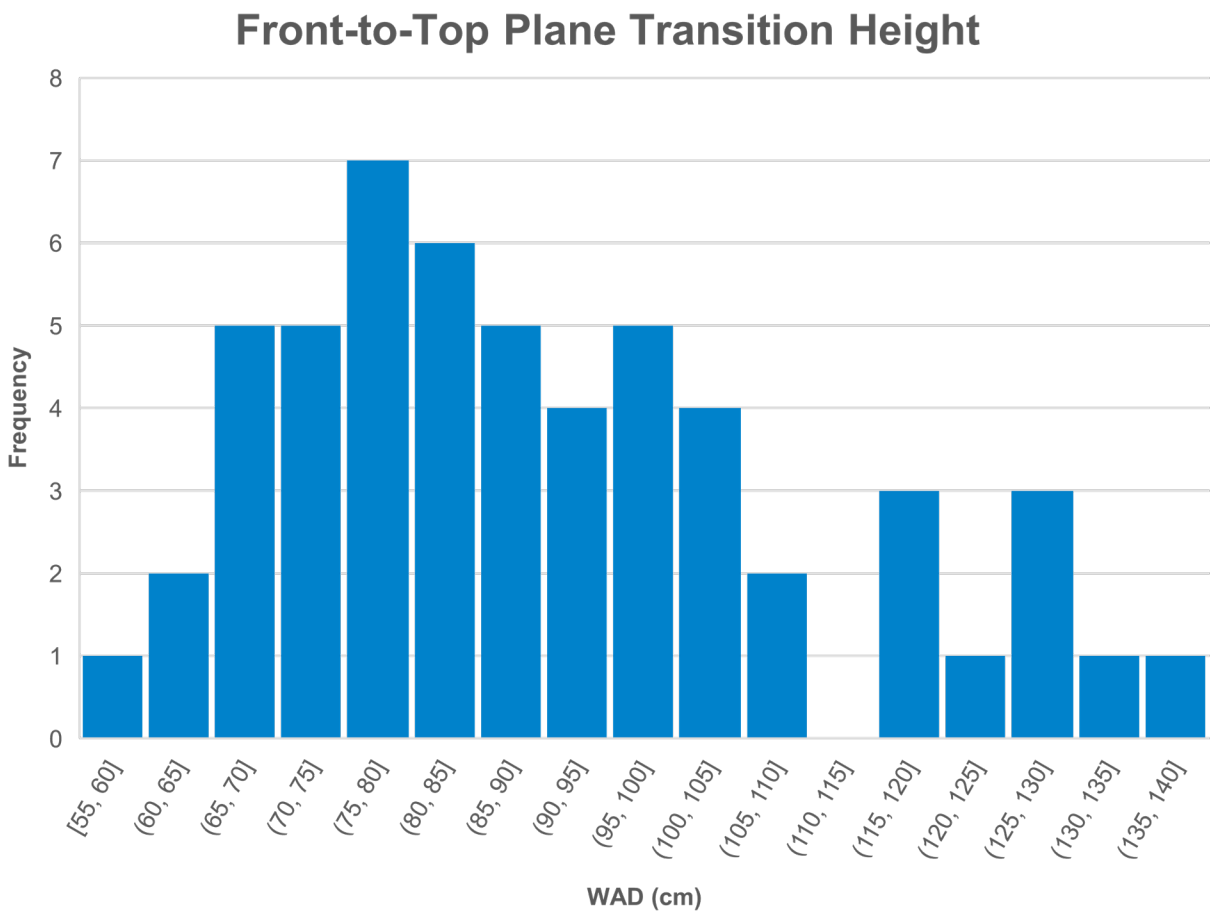

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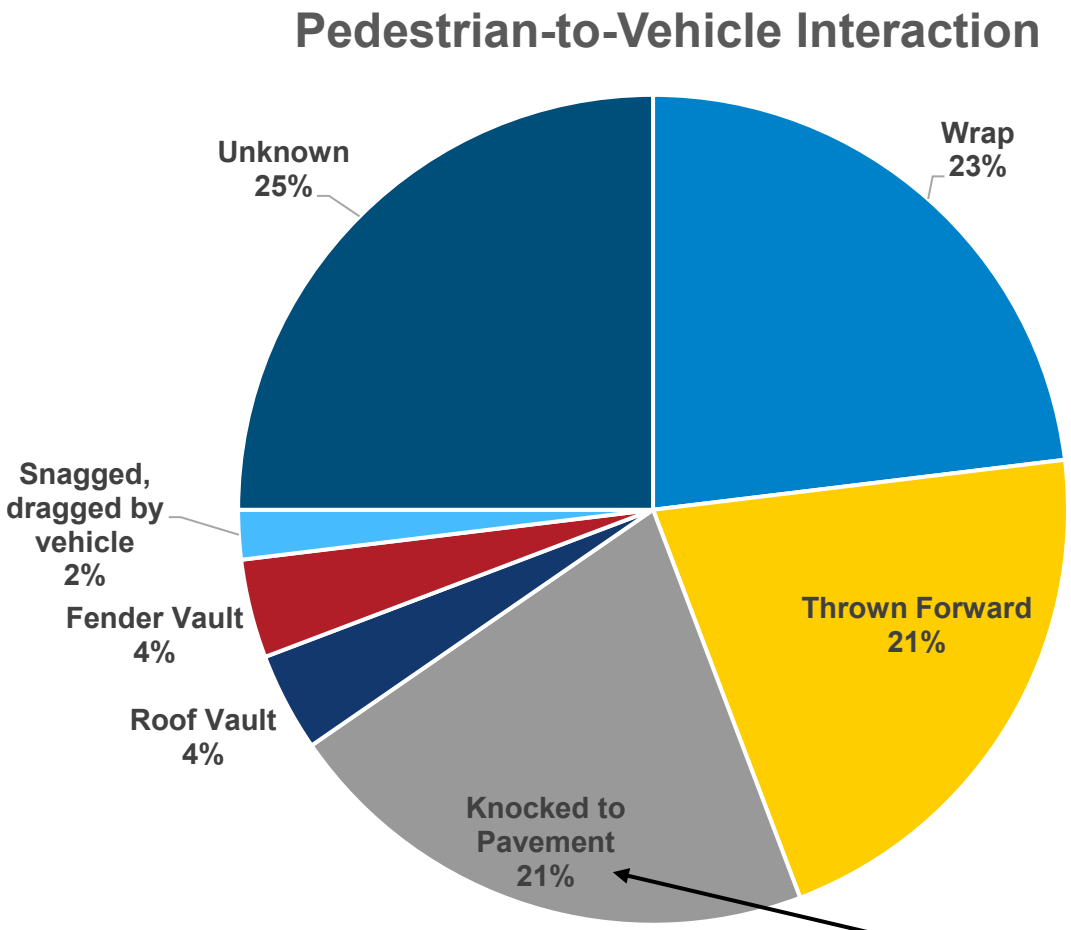
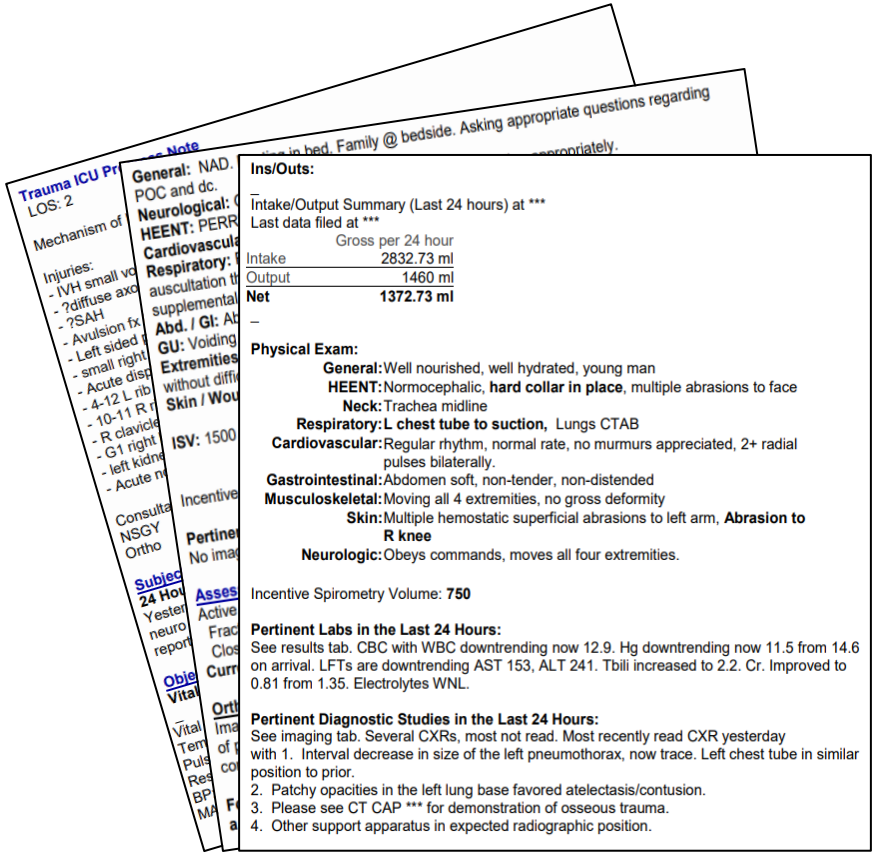


Pedestrian falls to the ground immediately in front of the vehicle

Injury and Engineering Center (IEC)

- CIREN Engineering Centers
  - Wake Forest University
  - Medical College of Wisconsin

- Review medical records and code injuries



Ins/Outs:

Intake/Output Summary (Last 24 hours) at ***
Last data filed at ***

	Gross per 24 hour
Intake	2832.73 ml
Output	1460 ml
Net	**1372.73 ml**

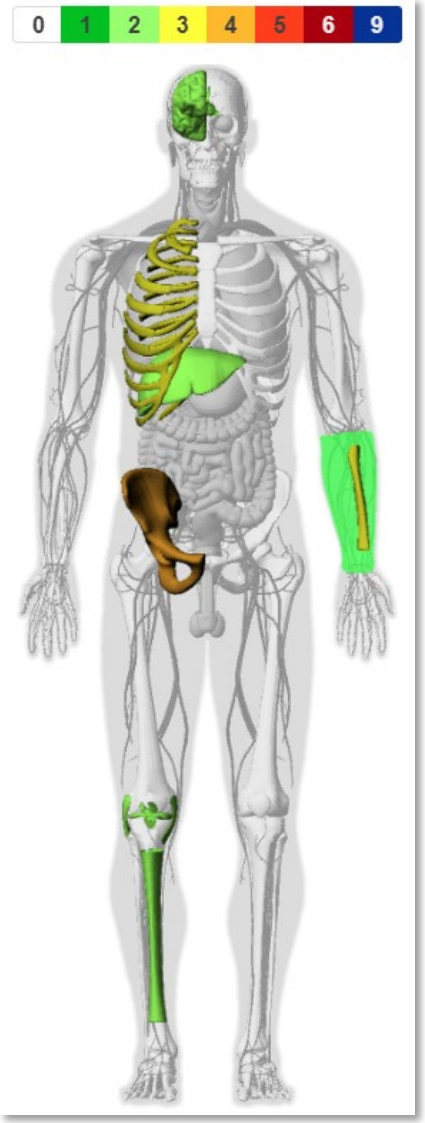
Physical Exam:

General: Well nourished, well hydrated, young man
HEENT: Normocephalic, **hard collar in place**, multiple abrasions to face
Neck: Trachea midline
Respiratory: **L chest tube to suction,** Lungs CTAB
Cardiovascular: Regular rhythm, normal rate, no murmurs appreciated, 2+ radial pulses bilaterally.
Gastrointestinal: Abdomen soft, non-tender, non-distended
Musculoskeletal: Moving all 4 extremities, no gross deformity
Skin: Multiple hemostatic superficial abrasions to left arm, **Abrasion to R knee**
Neurologic: Obeys commands, moves all four extremities.

Incentive Spirometry Volume: **750**

Pertinent Labs in the Last 24 Hours:
See results tab. CBC with WBC downtrending now 12.9. Hg downtrending now 11.5 from 14.6 on arrival. LFTs are downtrending AST 153, ALT 241. Tbili increased to 2.2. Cr. Improved to 0.81 from 1.35. Electrolytes WNL.

Pertinent Diagnostic Studies in the Last 24 Hours:
See imaging tab. Several CXRs, most not read. Most recently read CXR yesterday with 1. Interval decrease in size of the left pneumothorax, now trace. Left chest tube in similar position to prior.
2. Patchy opacities in the left lung base favored atelectasis/contusion.
3. Please see CT CAP *** for demonstration of osseous trauma.
4. Other support apparatus in expected radiographic position.



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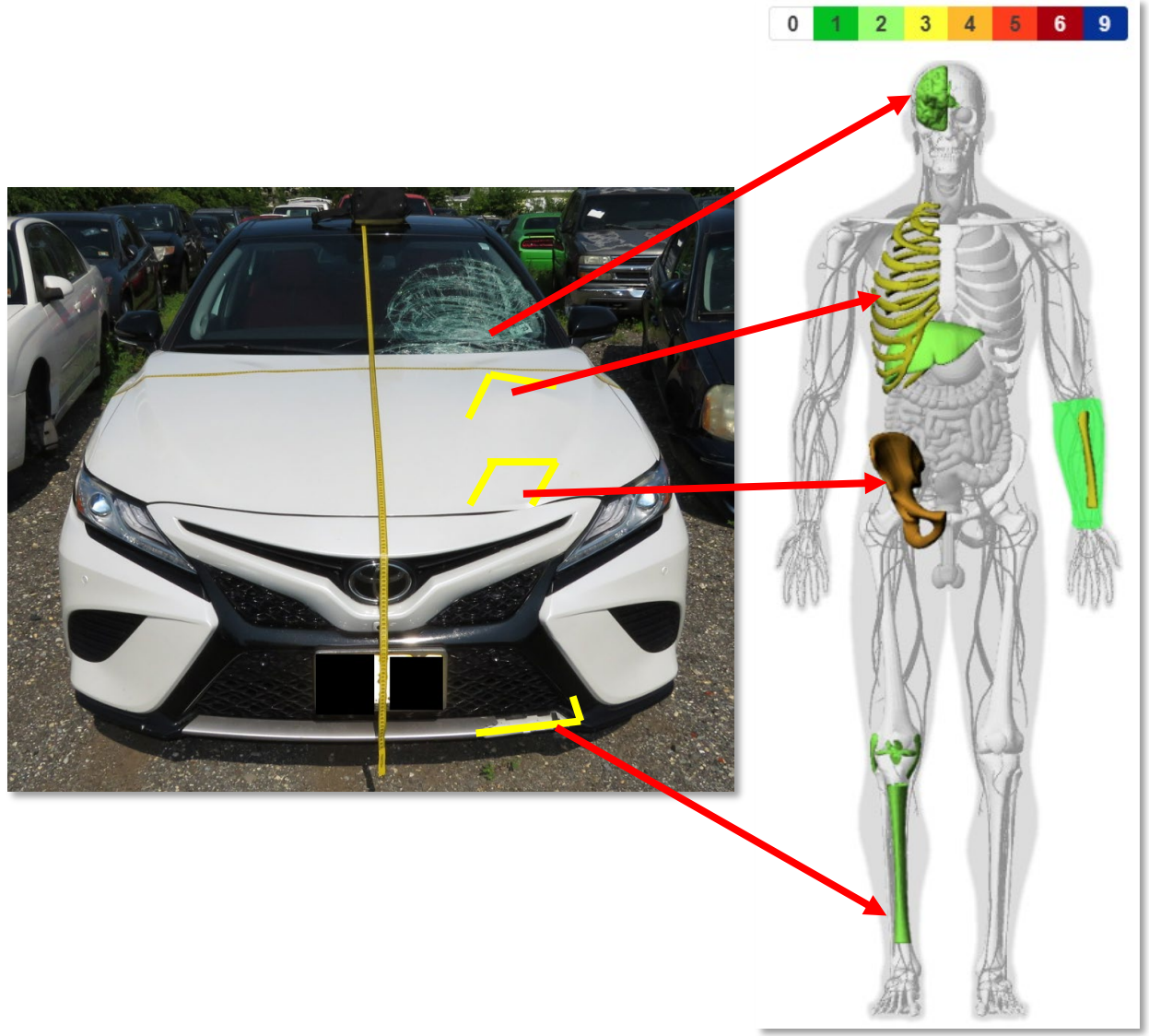

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- Determine kinematic trajectories

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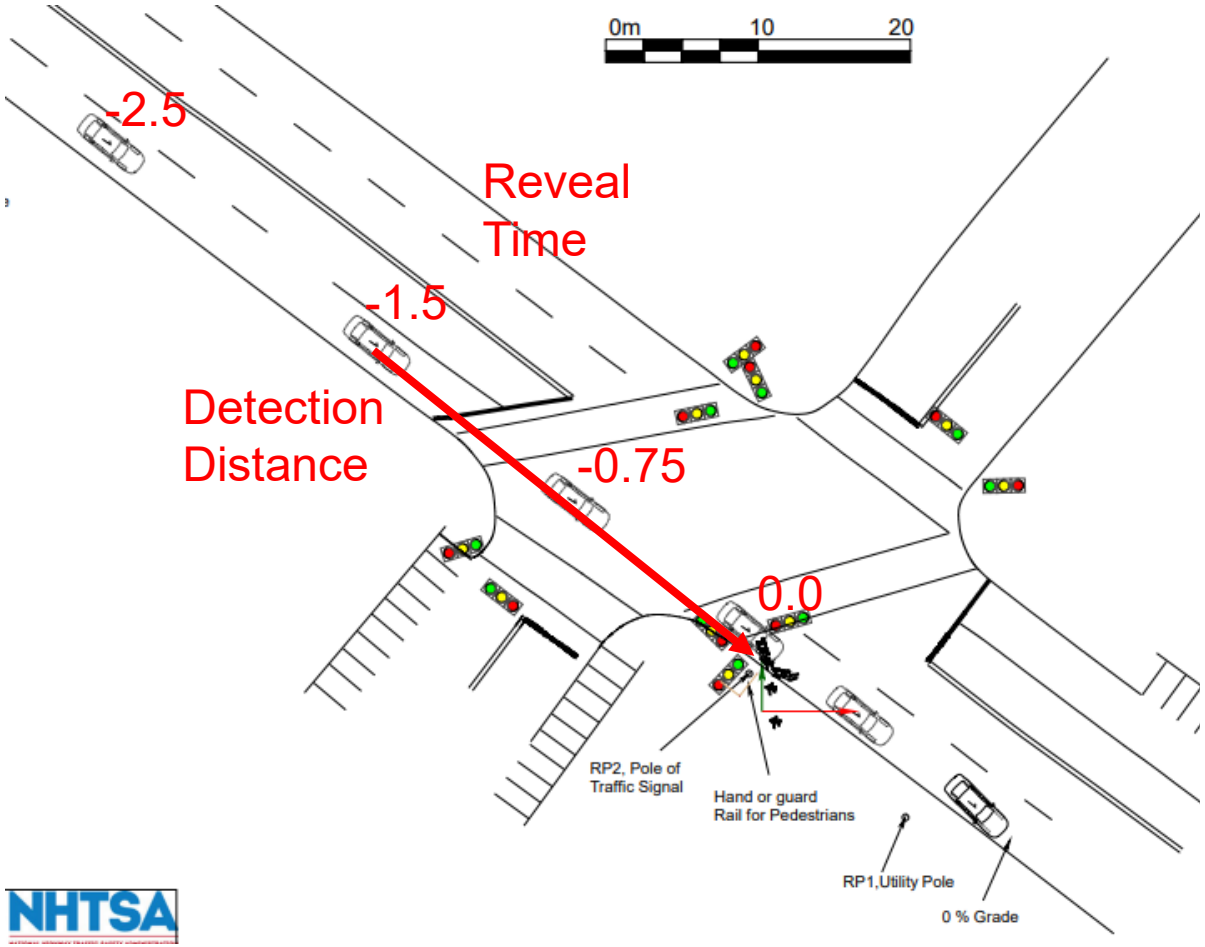
- Review medical records and code injuries
- Perform injury causation analysis
- Determine kinematic trajectories
- Review crash avoidance calculations



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Next Steps

- Case enrollment – complete
- Crash data population by PSU's – ongoing
- Injury and engineering analysis by IEC's – started
- Quality control and case publishing by NHTSA – future

Questions?

Jack Lockerby
jack.lockerby@dot.gov