Acknowledgements

FHWA
  • Joseph Cheung
  • Paul LaFleur
  • Dick Albin

ALDOT
  • John-Michael Walker
  • Stuart Manson
FAS background

- Started in 2004 and updated every few years (last in 2021)
- Data-driven approach to strategic planning
- Basis for focusing and prioritizing FHWA Safety Program resources for RwD, Intersections and Ped/Bike
- More info at https://safety.fhwa.dot.gov/fas/

Benefits

- Increases awareness of critical severe crash types.
- Provides data analysis and action plan development from initiation to implementation.
- Leads to critical safety infrastructure improvements by promoting the use of effective safety countermeasures.
- Assists FHWA, State DOTs, and localities when prioritizing resources.
- Creates positive organizational changes in safety culture, policies, and procedures.
RwD Safety in Alabama

- Fatal Crashes (2017 – 2021)
  - 867 annually
  - RwDs 58 percent
- Primary Most Harmful Events
  - Head-On
  - Trees
  - Rollovers
Previous RwD Safety Efforts

• 2014 RwD Safety Implementation Plan
  • Corridors were identified based on crash thresholds by type and roadway ownership
  • Estimated number of deployments and potential effectiveness
  • Actual deployment based on site investigation, or Road Safety Assessments (RSAs)

• 2021 FoRRRwD Assessment Action Plan
  • Included a review of documentation, reports, and onsite meetings with State and local stakeholders
  • Identified primary goals and supporting strategies
    • Expand use of Proven RwD Countermeasures
    • Integrate Systemic Safety
    • Increase Support for Local Safety Improvements
2024 ALDOT RwDSIP

- Builds on 2014 and 2021 RwD efforts
- Focuses on systemic safety approach
- Identifies priority locations for ALDOT follow-up

Plan Development Process
- Collect and integrate data
- Identify focus crash types
- Identify focus facility types
- Assess risk factors on focus facilities
- Develop prioritization
- Recommend countermeasures
Where Do RwDs Occur in Alabama?
# Alabama’s Most Harmful Event – KABC RwDs

<table>
<thead>
<tr>
<th>Collision Type</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rollover</td>
<td>1,950</td>
</tr>
<tr>
<td>Trees</td>
<td>1,866</td>
</tr>
<tr>
<td>Curb, Ditch, Embankment</td>
<td>1,446</td>
</tr>
<tr>
<td>Post and Poles</td>
<td>787</td>
</tr>
<tr>
<td>Head-on</td>
<td>634</td>
</tr>
<tr>
<td>Other fixed object</td>
<td>582</td>
</tr>
<tr>
<td>Ran-off-road</td>
<td>475</td>
</tr>
<tr>
<td>Barrier</td>
<td>218</td>
</tr>
<tr>
<td>Crossed Centerline/Median</td>
<td>125</td>
</tr>
</tbody>
</table>
Collect and Integrate Data

- ALDOT provided *crash, roadway, and traffic volume* data
  - Area type
  - Route Type
  - Number of lanes
  - Functional class
  - Speed limit
  - Shoulder width
  - AADT

- **Horizontal curves** estimated from ALDOT centerlines by University of Wisconsin

- **Elevation data** from U.S. Geological Survey’s National Map to identify approximate roadway grades
Focus Crash Types

**Focus Segment Crash Types**
- **Head-on** KA crashes
- **Tree** KA crashes
- **Nighttime** KA crashes
- **Rollover** KA crashes

**Focus Curve Crash Types**
- **RwD** KA crashes
- **Tree** KA crashes
- **Nighttime** KA crashes
- **Rollover** KA crashes

<table>
<thead>
<tr>
<th>Characteristic Type</th>
<th>Characteristic</th>
<th>KA RwD Crashes</th>
<th>BC RwD Crashes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of crashes</td>
<td>%</td>
<td>Number of crashes</td>
</tr>
<tr>
<td>Collision Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrier</td>
<td>215</td>
<td>1.67%</td>
<td>828</td>
</tr>
<tr>
<td>Curb, Ditch, Embankment</td>
<td>1,635</td>
<td>12.73%</td>
<td>5,188</td>
</tr>
<tr>
<td>Head-on</td>
<td>1,246</td>
<td>9.70%</td>
<td>1,929</td>
</tr>
<tr>
<td>Other</td>
<td>2,307</td>
<td>17.96%</td>
<td>10,533</td>
</tr>
<tr>
<td>Other fixed object</td>
<td>513</td>
<td>3.99%</td>
<td>1,996</td>
</tr>
<tr>
<td>Post and Poles</td>
<td>829</td>
<td>6.45%</td>
<td>3,049</td>
</tr>
<tr>
<td>Rollover</td>
<td>3,000</td>
<td>23.35%</td>
<td>5,526</td>
</tr>
<tr>
<td>Trees</td>
<td>3,102</td>
<td>24.15%</td>
<td>5,901</td>
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<tr>
<td>Lighting Conditions</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>E Dark - Unknown Roadway Lighting</td>
<td>37</td>
<td>0.29%</td>
<td>145</td>
</tr>
<tr>
<td>Dusk</td>
<td>333</td>
<td>2.59%</td>
<td>938</td>
</tr>
<tr>
<td>E Dark - Spot Illumination One Side of Road</td>
<td>461</td>
<td>3.59%</td>
<td>1,620</td>
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<tr>
<td>E Dark - Spot Illumination Both Sides of Road</td>
<td>496</td>
<td>3.86%</td>
<td>1,814</td>
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<tr>
<td>Daylight</td>
<td>7,200</td>
<td>56.04%</td>
<td>21,089</td>
</tr>
<tr>
<td>E Dark - Continuous Lighting Both Sides of Road</td>
<td>187</td>
<td>1.46%</td>
<td>758</td>
</tr>
<tr>
<td>Dark - Roadway Lighted</td>
<td>16</td>
<td>0.12%</td>
<td>239</td>
</tr>
<tr>
<td>E Dark - Continuous Lighting One Side of Road</td>
<td>36</td>
<td>0.28%</td>
<td>207</td>
</tr>
<tr>
<td>Dark - Roadway Not Lighted</td>
<td>3,779</td>
<td>29.42%</td>
<td>7,391</td>
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<tr>
<td>Dawn</td>
<td>281</td>
<td>2.19%</td>
<td>691</td>
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<tr>
<td>Unknown</td>
<td>19</td>
<td>0.15%</td>
<td>27</td>
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<tr>
<td>Other</td>
<td>0</td>
<td>0.00%</td>
<td>4</td>
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<tr>
<td>Not Applicable</td>
<td>2</td>
<td>0.02%</td>
<td>27</td>
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</tbody>
</table>
Focus Facility Types

- State-Owned Roads
  - Rural two-lane minor arterials and major collectors

- Local Roads
  - Rural two-lane minor arterials and major collectors
  - Urban two-lane minor arterials and major collectors

- Consistently the most prevalent and over-represented for each crash type
Risk Factor Assessment

Over-representation analysis

- Proportion of crashes on facilities with attribute
- Proportion of vehicle-miles traveled (VMT) on facilities with attribute
- Identify where proportion of crashes is higher than proportion of VMT
- Weighting for risk factor assigned based on degree of over-representation
## Risk Factor Results for Local Rural Two-lane Minor Arterials and Major Collectors

<table>
<thead>
<tr>
<th>Focus Crash Type</th>
<th>Grade</th>
<th>Curve Radius</th>
<th>AADT</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>657 ft – 1,312 ft [1]</td>
<td>501 – 1,000 [1]</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>501 – 1,000 [1]</td>
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<tr>
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<td></td>
<td>657 ft – 1,312 ft [1]</td>
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<td></td>
<td>501 – 1,000 [1]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>501 – 1,000 [1]</td>
</tr>
<tr>
<td>Head-on</td>
<td>&gt; 3 percent [1]</td>
<td>≤ 656 ft [1]</td>
<td>1,001 – 3,000 [1]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>657 ft – 1,312 ft [2]</td>
<td></td>
</tr>
</tbody>
</table>
RwD Risk Prioritization

- Weighted risk scores combined to create prioritization
- Provided as separate GIS file containing layers for
  - Location Details
  - Risk Level
  - Risk Attributes
  - Supporting Crash Data
Site-Specific KA RwD Crash Locations

- Separate file provided containing locations with at least one KA RwD crash over last 5 years
- Can be used for site specific evaluation or to identify tie-breakers for priority locations

Note: Locations shown include corridors with one or more KA RwD crashes over a five-year period, not exact locations
Roadway Departure Objectives

1st - Keep vehicles on the road

- Curve Signing
- Pavement Markings
- Delineators
- Friction Treatments
- Rumbles
- Lighting

2nd - Reduce the potential for crashes

- Widen Shoulders
- Sloped Pavement Edge
- Center Line Buffer
- Clear Zone
- Traversable Slopes

3rd - Minimize the severity

- Breakaway Devices
- Barriers
Plan Implementation

- Consists of engineering, education, and enforcement actions
- Details toolbox of countermeasures, including when to use, how to enhance, and potential effectiveness
- Emphasizes reviewing priority locations with road safety assessments (RSAs)
- Includes decision framework for selecting appropriate countermeasures
Plan Implementation

• Plan provides an estimate of countermeasure installations and potential benefits

• Largest benefits may be derived from the following:
  • Local Rural Two-Lane Minor Arterials and Major Collectors:
    • Installing wider edge line markings
    • Installing raised pavement markers
    • Installing center line rumble strips
    • Installing shoulder/edge line rumble strips
    • Installing sloped pavement edge
  • Local Urban Two-Lane Minor Arterials and Major Collectors
    • Installing wider edge line markings
    • Installing raised pavement markers
    • Installing sloped pavement edge
  • State Owned Rural Two-Lane Minor Arterials and Major Collectors
    • Installing center line rumble strips
    • Installing sloped pavement edge
Future Efforts

• FHWA will share final plan with ALDOT
• ALDOT will use priority locations to identify
  • Locations for potential RSA follow-up
  • Additional needs for projects already ongoing at these locations
• ALDOT will share data on local roads with local agencies