Roadway Departure Crashes in Kansas

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With Appreciation

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  • Akshit Ahuja
  • Auston Jacobsen
  • Akshay Patel
Roadway Departures in Kansas

- A crash which occurs after a vehicle crosses an edge line or a center line, or otherwise leaves the traveled way
Roadway Departure Crashes

- The FHWA states an average of 18,275 fatalities per year (2013 - 2015) resulted from roadway departure
  - 54% of all fatal crashes during that time period
- From the NMVCCS, we’ve learned the following about roadway departure crashes
  - 64 percent of all single vehicle crashes
  - Police narrative often assigns critical pre-crash critical factors on driver error
    - Driver performance errors (27% of passenger car roadway departures)
    - Driver decision errors (25%)
Roadway Departure Crashes

• From the NMVCCS study, other critical reasons included:
  • Internal distractions
  • Overcompensation
  • Poor directional control
  • Too fast for conditions
  • Sleeping/actually asleep

• Today I want to discuss our ongoing efforts to better understand these crashes that occur in Kansas
This is the first project in the United States completed under provisions of the new Federal Aid Highway Act of 1956.

Eight miles concrete pavement on US-40 Interstate Route No. 1

State Highway Commission of Kansas

Source: http://highway.umwblogs.org/invention/  
Source: Lawrence Journal World
Not All Routes are Interstates Though…

- Of the state’s 10,600 mile network
  - Class A - Interstates
Not All Routes are Interstates Though…

- Of the state’s 10,600 mile network
  - Class B - Non-Interstate routes with limited access and high-speeds
Not All Routes are Interstates Though…

• Of the state’s 10,600 mile network
  • Class C - Regional travel
Not All Routes are Interstates Though…

• Of the state’s 10,600 mile network
  • Class D - Inter-county transport - may have speed restrictions
Not All Routes are Interstates Though…

- Of the state’s 10,600 mile network
  - Class E - Routes for short trips
What We Did...

- Examined data from the statewide crash database, looking for only roadway departure crashes
  - 2004 - 2016
  - Only looked at two-lane roadways
    - So All Class A routes and some Class B routes were not considered
  - 6,881 fatal and injury crashes

<table>
<thead>
<tr>
<th>Year</th>
<th>F+I Crashes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>645</td>
</tr>
<tr>
<td>2005</td>
<td>639</td>
</tr>
<tr>
<td>2006</td>
<td>582</td>
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<td>2007</td>
<td>606</td>
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<td>2014</td>
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<tr>
<td>2015</td>
<td>427</td>
</tr>
<tr>
<td>2016</td>
<td>412</td>
</tr>
<tr>
<td>Total</td>
<td>6,881</td>
</tr>
</tbody>
</table>
Summary Data

• 75 percent of the vehicles were cars/pickups/SUVs/vans
• 70 percent of roadway departure crashes happened during daylight
• 27 percent of crashes had first identifiable cause as “Collision with motor vehicle”
Fatal and Injury Roadway Departure Crashes over Time

Average 3.8% reduction every year
Fatal and Injury Roadway Departure Crashes over Time

F+I by Route Type

- Class B
- Class C
- Class D
- Class E

Years: 2004 to 2016
Fatal and Injury Roadway Departure Crashes over Time
Ultimately what we want is to understand the rate at which rumble strips were installed by route class.

<table>
<thead>
<tr>
<th>Route</th>
<th>Percentage with Rumble Strips (of any type)</th>
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<tbody>
<tr>
<td>Class A</td>
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<tr>
<td>Class B</td>
<td>85</td>
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<tr>
<td>Class C</td>
<td>41</td>
</tr>
<tr>
<td>Class D</td>
<td>12</td>
</tr>
<tr>
<td>Class E</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: kansascyclist.com
Fatal and Injury Roadway Departure Crashes over Time

![Graph showing F+I Crash Rate per MVMT by Route Type with data points for different route classes from 2004 to 2016.](image-url)
Where We Go from Here

- We ultimately want to conduct an odds ratio analysis
  - Determine how rumble strip presence affects crashes
- But in order to do that we need to know when rumble strips were installed at a crash location
  - 390 installation projects to review
Other Factors We Plan to Examine

- Drug/alcohol involvement
- Gender and age
- Shoulder width and surfacing type
Questions