Preliminary Analysis of Speed Limit Changes in Eastern Oregon

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Method

Compare changes in speed and safety on segments with increased speed limits to control locations.

Control

65 mph segments
- 151 miles
- 5 speed stations
- I-5 and I-84 freeway

55 mph segments
- 539 miles
- 10 speed stations
- Some in Eastern Oregon, others in Valley/Coast

Increased Posted Speed

65 → 70 mph segments
- 417 miles
- 6 speed stations
- I-84, I-82 and US-395 (a 2-lane segment)

55 → 65 mph segments
- 1,009 miles
- 11 speed stations
- Mostly 2-lane segments in Eastern Oregon
OREGON HIGHWAY SPEED LIMIT INCREASES
Effective March 1, 2016

- Speed Limit 70
- Trucks 65
- Speed Limit 65
- Trucks 60

[Map of Oregon with marked areas and speed limit icons]
OREGON HIGHWAY SPEED LIMIT INCREASES
Effective March 1, 2016

Control Segments
Speed Comparisons

• Source
  • Automatic Traffic Recorders (ATR) – all vehicles by month
  • HERENow, as proof of concept

• Comparison Periods
  • Data from January 2015 to March 2018
  • May to October months only (without snow/ice)
  • December to February months only (winter months)

• Measures (all vehicles, by month)
  • Estimated average speed
  • Percent of vehicles exceeding 65 mph, 75 mph and 85 mph

• Statistical Tests
  • T-test of means (unequal variance)
  • Paired t-test of means (2015 to 2018)
Change in Average Speed Change (mph)

- Control (65 mph): 0.1
- Speed Change (70 mph): 3.0
  - 67.0 mph before, 69.9 mph after
- Control (55 mph): 0.1
- Speed Change (65 mph): 2.6
  - 55.9 mph before, 58.5 mph after
Change in Percent Exceeding

Percent of Vehicles > 75 mph

<table>
<thead>
<tr>
<th>Condition</th>
<th>Percent of Vehicles &gt; 75 mph</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (65 mph)</td>
<td>1.7</td>
</tr>
<tr>
<td>Speed Change (70 mph)</td>
<td>12.0</td>
</tr>
<tr>
<td>11.5% before, 23.5% after</td>
<td></td>
</tr>
<tr>
<td>Control (55 mph)</td>
<td>0.2</td>
</tr>
<tr>
<td>Speed Change (65 mph)</td>
<td>1.9</td>
</tr>
<tr>
<td>1.5% before, 3.3% after</td>
<td></td>
</tr>
</tbody>
</table>

Percent of Vehicles > 85 mph

<table>
<thead>
<tr>
<th>Condition</th>
<th>Percent of Vehicles &gt; 85 mph</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (65 mph)</td>
<td>0.0</td>
</tr>
<tr>
<td>Speed Change (70 mph)</td>
<td>0.9</td>
</tr>
<tr>
<td>0.8% before, 1.8% after</td>
<td></td>
</tr>
<tr>
<td>Control (55 mph)</td>
<td>0.1</td>
</tr>
<tr>
<td>Speed Change (65 mph)</td>
<td>0.3</td>
</tr>
<tr>
<td>0.1% before, 0.4% after</td>
<td></td>
</tr>
</tbody>
</table>
Crash Comparisons

• Measures
  • All vehicle traffic volume
  • All vehicles: 1) Total crashes 2) Fatal + Injury A crashes
  • Truck-involved: 1) Total crashes 2) Fatal + Injury A crashes
  • Proportions by Crash Types

• Comparison Periods
  • Data from March 2013 to February 2017
  • Year is March to February
  • March to October

• Index ( > 1.0 is increase in crashes)
  • Index = \( \frac{\text{Crashes in the post 1 year period}}{\text{Average crashes per year in the 3 year pre-period}} \)

  • also calculated index for 1 year prior, not shown in this PPT
Total Crashes, Control Segments

Total Crashes, Increased Speed Segments

[Charts showing total crashes per year for control and increased speed segments, with speed limits and post-indications.]
Fatal and Injury A Crashes, Control Segments

Fatal and Injury A Crashes, Increased Speed Segments

[Charts showing crash data by year and speed limit changes]
Changes in Crash and Volumes (Index)

- **Total Monthly Volume**
  - Control (65 mph): 1.0
  - Speed Change (70 mph): 1.1

- **Total Crashes (All)**
  - Control (65 mph): 1.20
  - Speed Change (70 mph): 1.75

- **Fatal & Inj. A Crashes (All)**
  - Control (65 mph): 1.37
  - Speed Change (70 mph): 1.36

- **Total Crashes (Trucks)**
  - Control (65 mph): 1.02
  - Speed Change (70 mph): 2.00

- **Fatal & Inj. A Crashes (Trucks)**
  - Control (65 mph): 1.67
  - Speed Change (70 mph): 1.29
Changes in Crash and Volumes (Index)

- Total Monthly Volume
  - Control (55 mph): 1.1
  - Speed Change (65 mph): 1.2

- Total Crashes (All)
  - Control (55 mph): 1.05
  - Speed Change (65 mph): 1.43

- Fatal & Inj. A Crashes (All)
  - Control (55 mph): 1.21
  - Speed Change (65 mph): 1.67

- Total Crashes (Trucks)
  - Control (55 mph): 0.83
  - Speed Change (65 mph): 1.47

- Fatal & Inj. A Crashes (Trucks)
  - Control (55 mph): 0.69
  - Speed Change (65 mph): 1.60
Preliminary Observations

• **Speeds**
  ↑ Increase in average speeds (+3 mph)
  • More vehicles traveling at higher speeds (i.e. >75 mph)

• **Crashes – Speeds raised to 70 mph cars / 65 mph trucks**
  ↑ Increase in total crashes (~+382 cr/yr)
  • No apparent change in fatal and injury A crashes
  ↑ Increase in truck-involved crashes (~+140 cr/yr)
  • A possible decrease in truck-involved fatal injury A crashes

• **Crashes – Speeds raised to 65 mph cars / 60 mph trucks**
  ↑ Increase in total crashes (~+223 cr/yr)
  ↑ Increase in fatal and injury A crashes (~+20 cr/yr)
  ↑ Increase in truck-involved crashes (~+37 cr/yr)
  ↑ Increase in truck-involved fatal and injury A crashes (~+3 cr/yr)
Limitations of Study

• Speed analysis
  • ATR speed data includes trucks and some ATRs have heavy truck volumes
  • ATR coverage is somewhat sparse for 2-lane segments in Eastern Oregon
  • Did not look at speed differences between cars/trucks

• Safety analysis is preliminary
  • Method is basic and is not statistically rigorous
  • Control highways not ideally matched
  • 2017 crash data is preliminary and subject to change
  • Post year includes Jan 2017 and Feb 2017 (winter weather conditions)
Questions

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