Optimizing Cross Boarder Truck Safety

Cross Boarder Regional Truck Transportation Conference

John Woodroofe
June 15, 2005
Overview

- Examining the truck crash picture
- Focus on the more significant crash types
- Discuss LCV safety and policy
<table>
<thead>
<tr>
<th>Crash Type</th>
<th>Nonfatal %</th>
<th>Fatal %</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head on / side swipe</td>
<td>4.8</td>
<td>24.4</td>
<td>5.2</td>
</tr>
<tr>
<td>Hit object on road</td>
<td>6.1</td>
<td>7.5</td>
<td>6.1</td>
</tr>
<tr>
<td>Ran off road</td>
<td>10.2</td>
<td>7.7</td>
<td>10.2</td>
</tr>
<tr>
<td>Turn across</td>
<td>16.5</td>
<td>9.6</td>
<td>16.4</td>
</tr>
<tr>
<td>Rear end / side swipe</td>
<td>40.5</td>
<td>21.8</td>
<td>40.3</td>
</tr>
<tr>
<td>Totals</td>
<td>82.1</td>
<td>71.0</td>
<td>78.2</td>
</tr>
</tbody>
</table>
At Issue - Key Findings

- Large truck rear-end collisions are common
- The occurrence of truck striking rear-end collisions is significantly greater than the occurrence of truck struck rear-end collisions
- Truck striking rear end collisions imply truck at fault
Comparison Fatal Truck Crashes
Maine (state vs. turnpike)
1999 - 2001

<table>
<thead>
<tr>
<th>Condition</th>
<th>State Wide</th>
<th>Turnpike</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total fatal crashes</td>
<td>78</td>
<td>11</td>
</tr>
<tr>
<td>Apparent truck fault</td>
<td>24%</td>
<td>64%</td>
</tr>
</tbody>
</table>
Fatal Truck Crash (turnpike) 
Primary Factors

- Rear end sideswipe and rear end avoidance crashes account for 45% of turnpike fatal truck crashes
- Truck driver fault is strongly represented
- Rear end sideswipe crashes are associated with congestion / differential speed
- Driver attention appears to be the primary human factor in rear end sideswipe and avoidance crashes
- The average driver age for at fault rear end sideswipe 46yrs
Comparing strike or struck role for pass cars and trucks (semi)

NASS/GES Data (2001)

All Roads

Pass car

T-semi

Percent

Strike

Struck

Strike/struck
Truck (all types) rear-end “fatal” crashes by road type

(Blower)
**NASS / GES Data**

(2001)

Note: *trucks over 10,000 lb*)

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**All Roads**

<table>
<thead>
<tr>
<th></th>
<th>Struck</th>
<th>Strike</th>
<th>Strike/struck</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All trucks</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Semi</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pass cars</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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*Percent*

```plaintext
0  10  20  30  40  50  60  70
```
Other important findings

(Blower)

- 90% of fatal truck rear-end crashes occur on straight roads
- Only 3.1% of fatal truck striking rear-end crashes occur on snowy/icy roads
- 75% of fatal truck rear-end crashes occur away from intersections
LCV Safety
Alberta’s LCV Experience

Rock Mountain Double
101 ft maximum

Turnpike Double
125 ft maximum
Alberta’s LCV Experience

115 ft maximum

Triple
Exposure Measurements
(Distance Traveled by Vehicle Type)

- 14 highway segments selected
  - 9 two lane segments
  - 5 four lane segments
- Annual Average Daily Traffic (AADT) counts were conducted for all vehicles
- A separate vehicle classification count was conducted to determine the mix of truck configurations (7 day 24 hour sample)
Crash Rates

Crash rate per 100 million km

- Triples
- Turnpike Doubles
- Rocky M. Doubles
- All LCVs
- Tractor semi

Legend:
- Fatal
- Injury
- PDO
## Best Practice LCV Benefits

<table>
<thead>
<tr>
<th>Factors</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck km reduction</td>
<td>44%</td>
</tr>
<tr>
<td>Cost saving to shipper</td>
<td>29%</td>
</tr>
<tr>
<td>Reduction in fuel and green house gases</td>
<td>32%</td>
</tr>
<tr>
<td>Reduction in road consumption</td>
<td>40%</td>
</tr>
<tr>
<td>Exposure crash reduction</td>
<td>44%</td>
</tr>
<tr>
<td>Policy affected crash rate reduction</td>
<td>500%</td>
</tr>
</tbody>
</table>
Alberta LCV Safety Benefits

- Based on a “Special Permit System”
- Vehicle operations are controlled to minimize risk
- Restrictions related to time of day, weather, driver qualifications, safety practice and routing
Factors Influencing Transport Risk

- Population density
- Traffic volumes/condition (e.g. vacation traffic)
- Road class
- Weather and road condition
- Road curviness (vertical & horizontal)
- Overtaking opportunities
- Commodity risk
- Operational factors
- Alternative transport mode options
- Driver and company experience
Special Permit Management

- Meaningful enforcement is essential
- Highway safety and weight violation information must be linked to the enforcement program
- Regular incident reporting by carriers important to ensure maximum benefit
- The system should foster pride – it should be seen as a privilege and not a right
- Acceptance into the program should have a minimum performance threshold
Concluding comments

• Truck striking rear-end/sideswipe crashes are the dominant truck at fault crash type
• Substantial safety benefits (factor of 5) can be achieved through risk based policy