Assessment of Distracted Driving At Highway-Rail Grade Crossings

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Background

Highway-rail grade crossings are critical junctions in the transportation system

Most crashes are the result of motor vehicle drivers' encroachments on railroad right of way

Complexity of the situation requires motor vehicle drivers to pay close attention

Distracted drivers at level crossings can create unsafe conditions for themselves and others

Background

Operation Lifesaver reported that approximately 3% of all vehicle-train crashes involved distracted driving

20% of all crashes at crossings involved motor vehicles striking trains present at crossings

46% of fatal crashes at level crossings in Australia involved distracted driving

NHTSA reported drivers engaging in non-driving tasks 30% of the time vehicles are in motion

Distracted Driving

Significant body of literature exists

Various definitions of distraction

"A distraction occurs when a driver's attention is diverted away from driving by a secondary task that requires focusing on an object, event, or person not related to the driving task"

Secondary task complexity, duration, & frequency important safety aspects

Objectives

Information on distracted driving at level crossings relatively sparse

At level crossings: estimate frequency of distracted driving, and identify driver characteristics associated with distracted driving

Types of Secondary Tasks

Talking to front seat passenger

Eating/drinking

Cell phone usage

Smoking

Reaching for an in-vehicle object

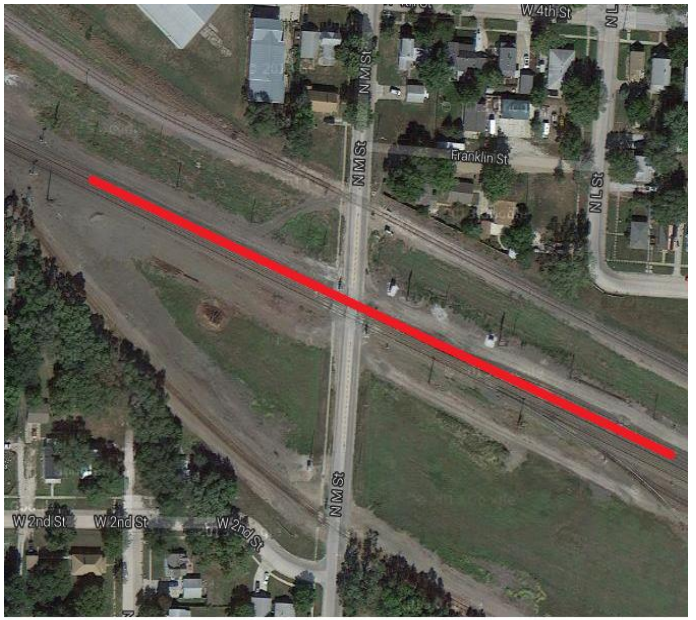
Distracted by outside events

Other actions (e.g., grooming, …)

Data Collection

Video recorded at two level crossings in Nebraska

- Old Cheney crossing in Lincoln
- M Street crossing in Fremont



Video Recording Setup

Mobile trailer in Lincoln and permanent camera in Fremont

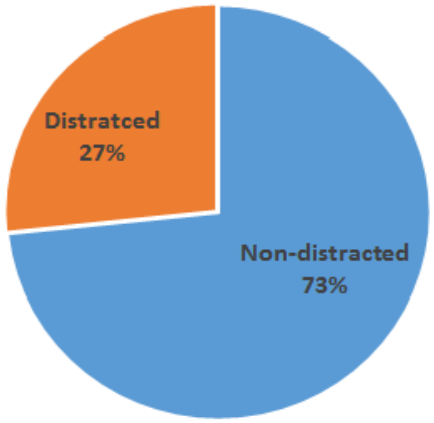
Data

1501 drivers reviewed from video footage

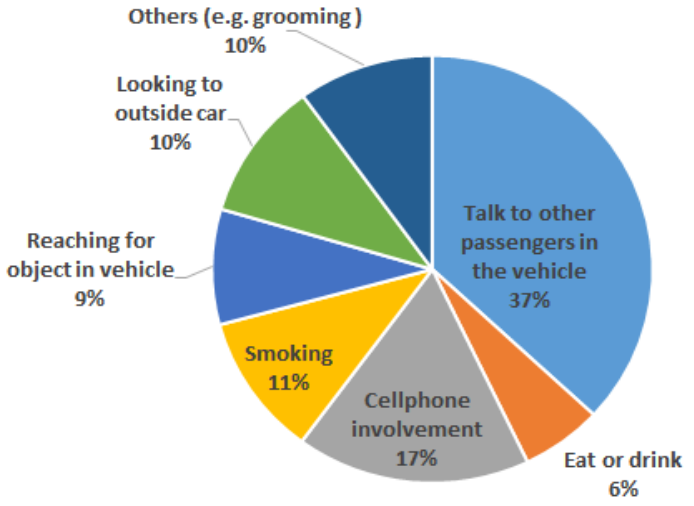
1009 male and 492 female drivers

225 male 95 female drivers accompanied by passengers (front seat)

Distribution of distracted and non-distracted driving activities

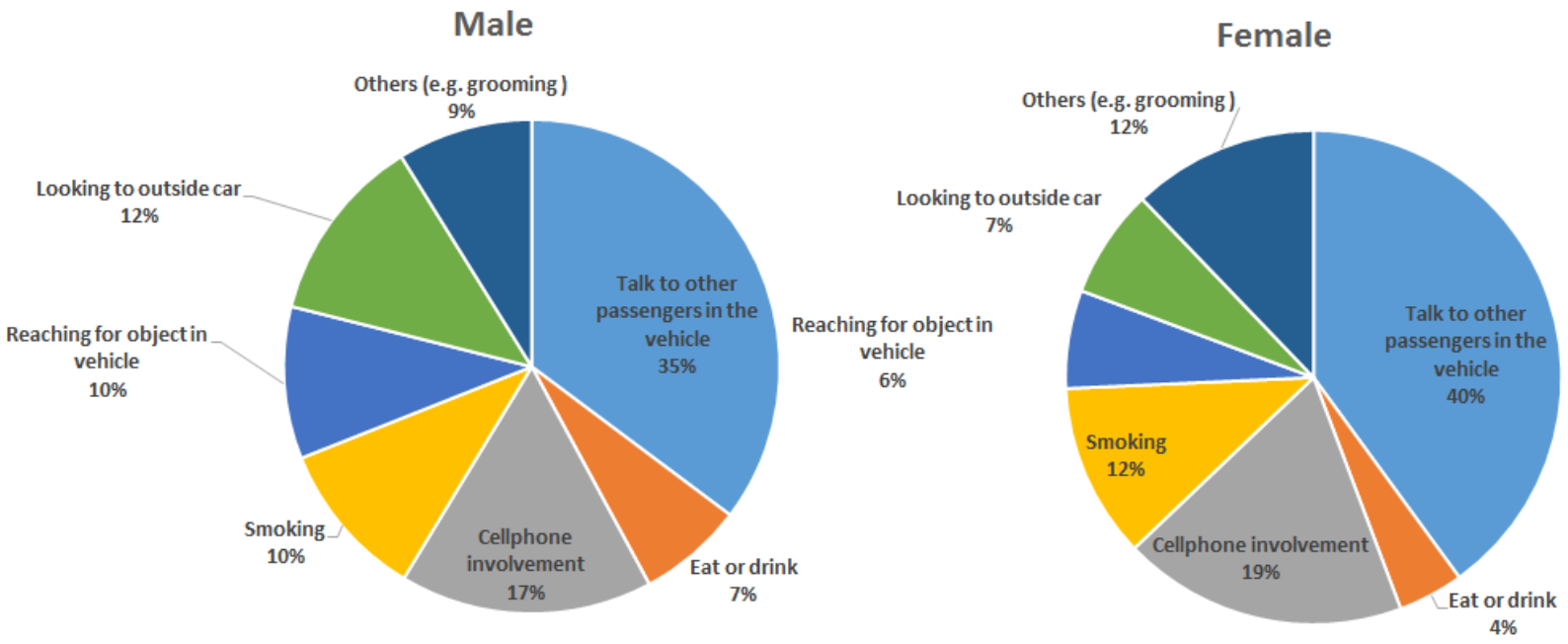


Distribution of seven distracted driving activities



Distractions – Males vs Females

26% male and 29% female drivers were distracted



Differences in Distracted Driving

Male vs female comparison of different activities

Type of Activity	Diff. (%) Male vs Female
Talk to other passengers in the vehicle	-5%
Eat or drink	3%
Cellphone use	-2%
Smoking	-1%
Reaching for object in vehicle	4%
Looking outside the car	5%
Others (e.g., grooming)	-3%

No statistically significant difference!

Gate Violations and Distractions

16 Crossing gate violations were noted (passing under ascending gates)

4 violations (25%) included distracted driving (cell phone use, smoking, reaching for in-vehicle object)

Larger sample size needed for conclusive results

Summary and Conclusions

Most frequent distraction was talking to passenger followed by cell phone usage

Cell phone usage is perhaps one of the few distractive activities that may be controlled with policy

Nebraska law against distracted driving

- Under 18 years–prohibited from cell phone use
- Adult drivers–prohibited from texting

"Secondary law"

Recommendations

Explore ways to cut down on cell phone usage

Effects of enforcement of existing laws

Conduct research in diverse geographic locations with diverse driver populations

States with varying laws against distracted driving may reveal different findings

Questions?