



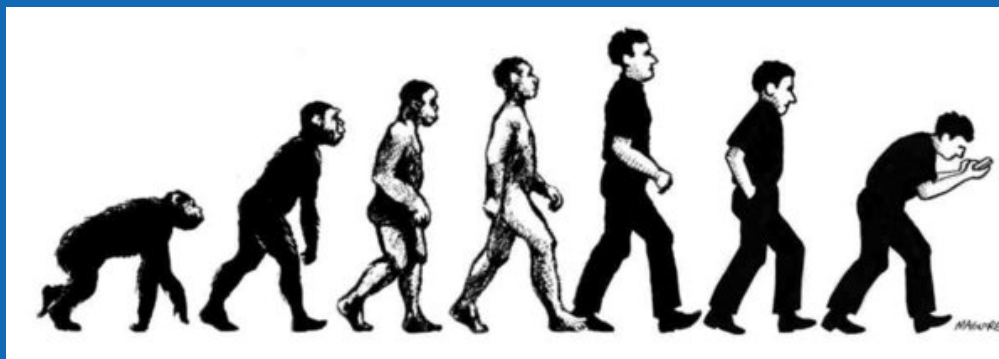
# **Pedestrian and Driver Distraction: Overview & NHTSA Prevalence and Risk Study**

Heidi Coleman, NHTSA  
Bob Scopatz, VHB



# What is Distraction?

- Distraction is any activity that can divert a person's attention away from their primary task.
- Types:
  - Visual, manual and cognitive
- Examples of distraction include:
  - Texting
  - Using a cell phone
  - Using a navigation system
  - Adjusting a radio, CD player, or MP3 player





## Facts about Distraction

Drivers observed text-messaging or manipulating handheld devices:

- 1.7% in 2013
- 2.2% in 2014
- 2.2% in 2015

When texting:

- Eyes off the road - average of five seconds
- Equivalent to length of a football field, when traveling at 55mph (VTTI, 2009)

More than half (53%) of all adult cellphone owners have been on the giving or receiving end of a distracted walking encounter. (Pew Research Center, 2012)





# Distracted Driving

In 2014, distraction was reported in:

- 10% of fatal crashes
- 18% of injury crashes

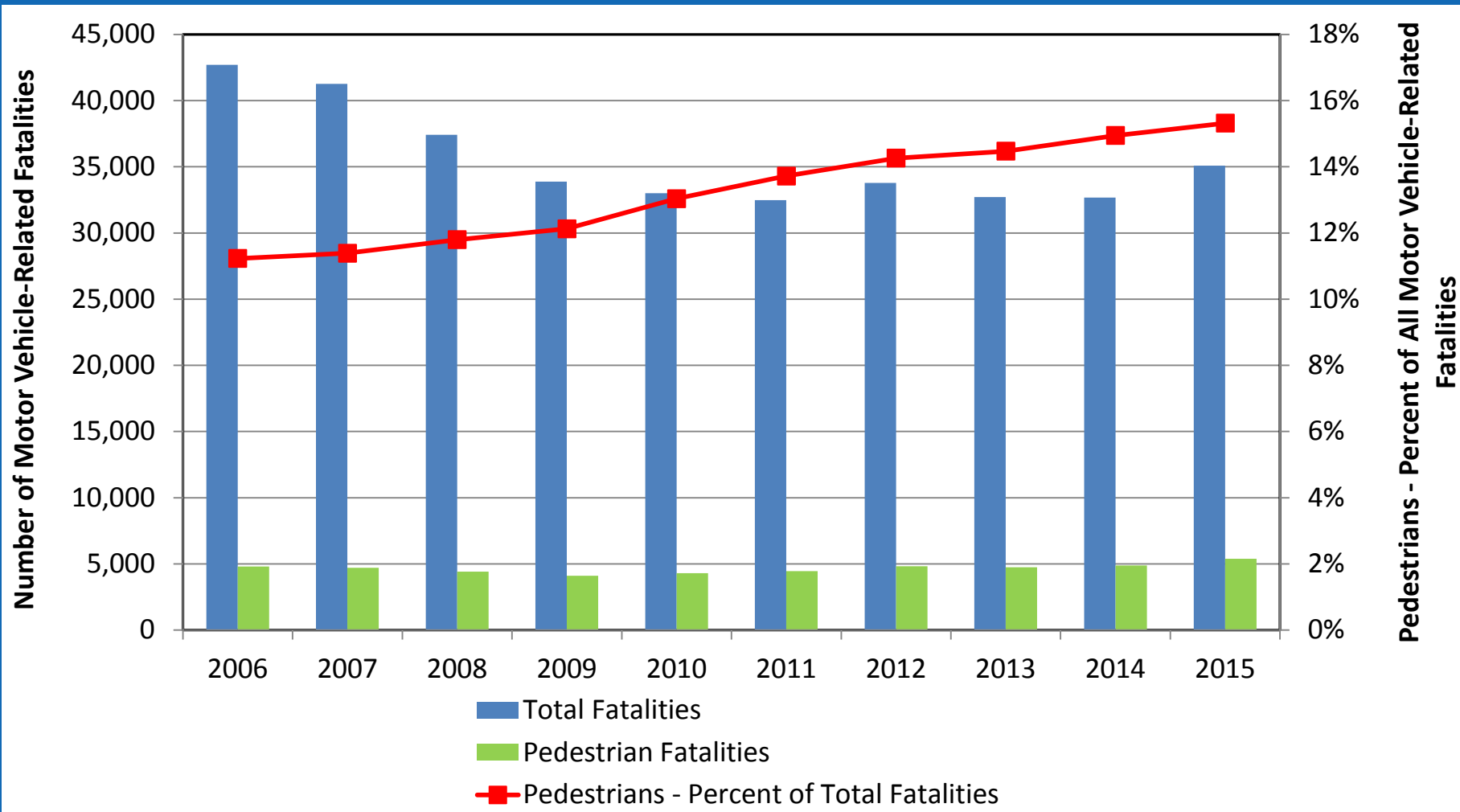
Of the 3,179 distraction-affected fatalities:

- 420 (13%) were pedestrians



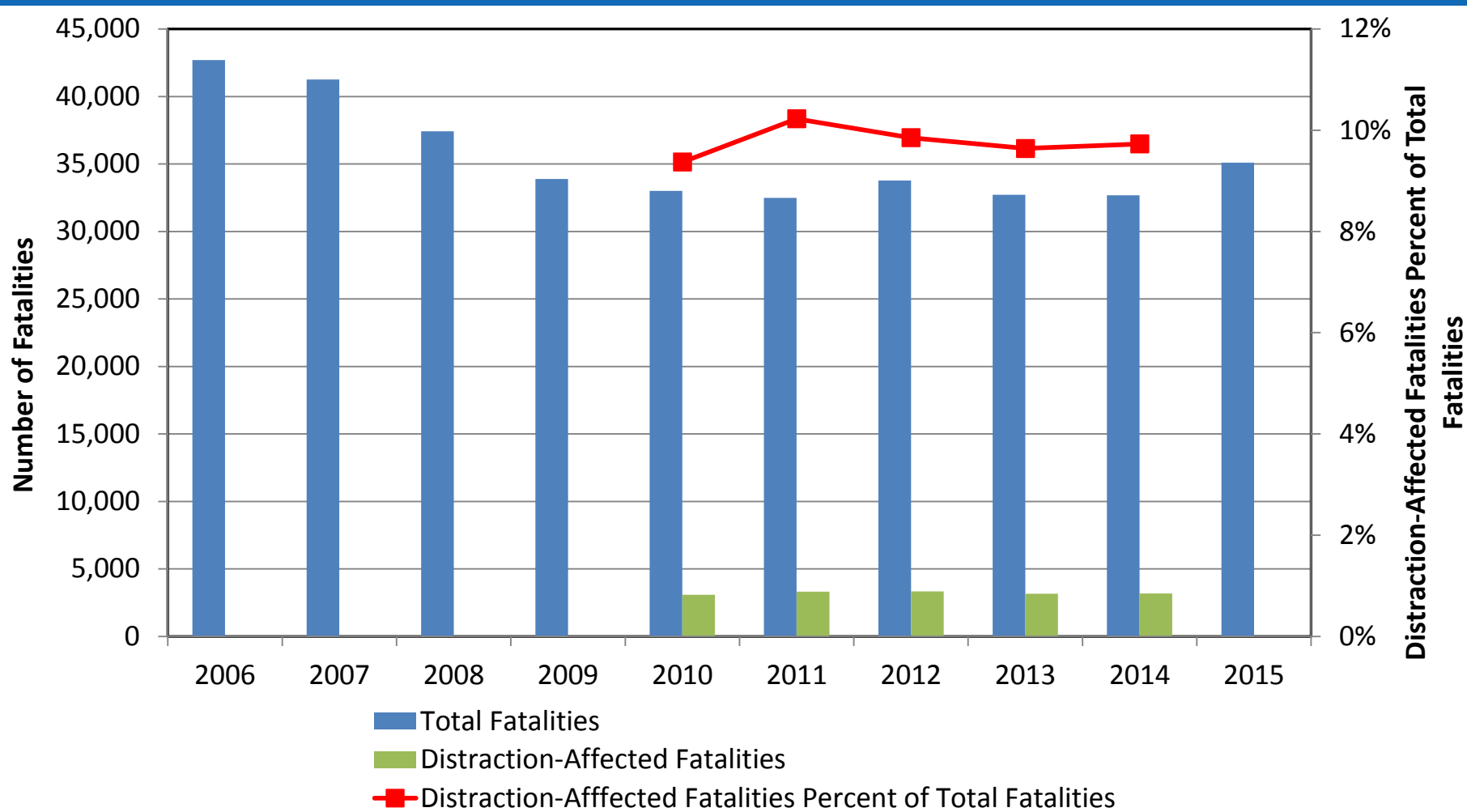


# Fatalities – Overall & Pedestrians





# Fatalities – Overall & Distraction-Affected





# NHTSA Pedestrian and Driver Distraction Study

- NHTSA Office of Behavioral Safety Research
  - Project lead was Kristie Johnson, Ph.D.
  - Heidi Coleman, J.D., provided reviews and guidance as Division Chief
- VHB team included team lead (Bob Scopatz, Ph.D.) plus
  - Traffic engineering (Yuying Zhou, P.E.)
  - Field data collection team (Steve Epley and six staff)
  - Statistical analysis (Scott Himes, Ph.D., P.E.)



# The Study's Research Goals

- Quantify “distraction” among pedestrians and drivers at intersections
- Identify the most prevalent distractors - electronic or otherwise
- Quantify the safety-related behaviors of pedestrians at intersections
- Quantify the *risk* associated with pedestrian and driver distraction







# Study Components

- Key Components
  - Literature Review
  - Naturalistic Observations
  - Crash Data Analysis





# The Literature Review

- Reviewed all available literature on:
  - Pedestrian Distraction
  - Driver Distraction
  - Interaction Between Pedestrians and Vehicles
- Types of studies included:
  - Naturalistic Observations
  - Simulator Studies
  - Laboratory Experiments
  - Analysis of Crash and Injury Data
  - Engineering Studies



# Literature Review Highlights: Pedestrian Distraction

- Distraction changes the way pedestrians walk, react and behave:
  - “Inattentional” blindness
  - Path keeping
  - Crossing times, gait, and stride
- There are no studies showing a direct link between the behavioral effects of distraction and pedestrian crash risk





# Literature Review Highlights: Driver Distraction

- Well studied; impacts include:
  - Response time
  - Driving Performance
  - Field of Vision
- Risks associated with some distractors (e.g., texting) have been demonstrated
- There is evidence that some drivers “compensate” by adjusting speed and following distances
  - But the adjustments are incomplete or not entirely effective





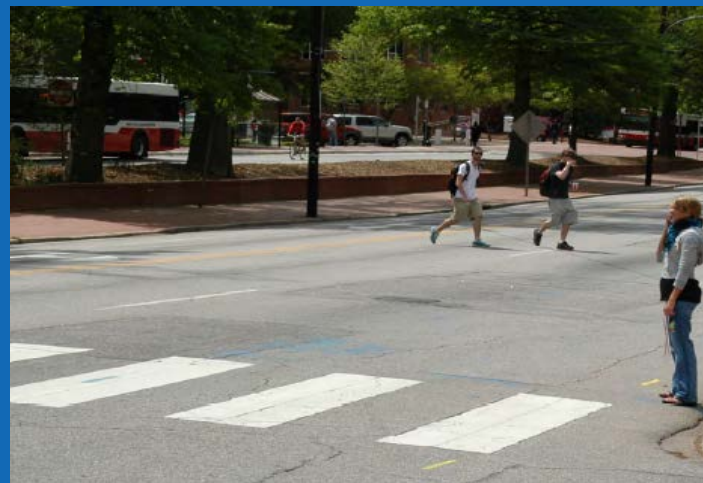
# Literature Review Highlights: Pedestrian-Vehicle Interaction

- Not many studies on distraction and the interaction of pedestrians and vehicles
- Some studies focus on traffic “conflicts” as a predictor of crashes:
  - Focus on the interaction of two road users
  - At least one must change course or speed to avoid an imminent collision
- These findings were helpful as a foundation for the other portions of our study



# Our List of Distractors

- Electronic Distractors
  - Cell Phone
  - Audio Device
  - Tablet
  - GPS
  - Other Electronic
- Non-electronic Distractors
  - Other People
  - Reading
  - Eating or Drinking
  - Other





# What Does a Traffic Conflict Look Like?

- Pedestrian and vehicle come within a few seconds or feet.
- Someone has to slow or stop to avoid collision.
- Someone has to change direction to avoid collision.





## What Makes a Serious Conflict “Serious”?

- Pedestrian leaps, runs, or makes any other large, rapid movement.
- Vehicle makes an emergency maneuver such as *hard* braking, acceleration, or swerving.
- They actually connect. (We did not encounter this, thankfully.)



Source: [dashcamaccidents.com](http://dashcamaccidents.com)





# Research Methods: Field Data Collection

- Four simultaneous observation types (one observer per type):
  - Pedestrian count and distraction prevalence
  - Pedestrian crossing behavior, distraction, and traffic conflict
  - Vehicle count and driver distraction prevalence
  - Vehicle conflict and driver distraction paired with pedestrian observations



# Special Features of the Methodology

- Train to 95% agreement
- “Promoted” the best observers to more difficult tasks
- Supervisors did tandem observations as a QC check
- Let go observers who couldn’t maintain criterion performance





# What the Results Will Tell Us: Basic Counts

- What proportion of pedestrians and drivers are distracted?
- What distractors are most common?
- Who are the most likely distracted pedestrians and drivers?
  - Male / Female
  - Age Groups
- Does location type and time of day matter?



# Some Basic Preliminary Results

- 3,964 pedestrians counted
  - 69% distracted by a variety of sources, both electronic (e.g., cell phones) and not (e.g., other people, or eating and drinking)
    - Females more distracted
  - Cell phones and mp3 players were most common electronic distractors
  - Other people and eating/drinking were most common non-electronic distractors
- 4,184 drivers counted
  - 54% distracted by a variety of sources
  - Males and females equally distracted
  - Same order of distractor categories, different prevalence



# What the Results Will Tell Us: Detailed Analyses

- Do distracted pedestrians have increased risk of traffic conflicts?
  - Also, do they act differently at crossings compared to non-distracted pedestrians?
- Do distracted drivers have increased risk of traffic conflicts?
- If both the driver and the pedestrian are distracted, what is the risk?
- Do electronic devices pose a greater threat than other distractors?
- Which sources of distraction are the most distracting?
- Are pedestrians doing anything that mitigates the risk?



# Timeline

- The study is complete
- The report is in Draft for NHTSA review and approval
- Planned iterations before it is final in late 2016
- Journal article planned for 2017





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**NHTSA**

**THANK YOU!**

