



INSURANCE INSTITUTE
FOR HIGHWAY SAFETY

HIGHWAY LOSS
DATA INSTITUTE

www.iihs.org

The Road to Vision Zero: Driver errors and distraction

2014 Director's Regulatory Summit
St. Louis, MO • October 15, 2014

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President, IIHS and HLDI

Who are we?

The Insurance Institute for Highway Safety,

founded in 1959, is an independent, nonprofit, scientific, and educational organization dedicated to reducing the losses — deaths, injuries, and property damage — from crashes on the nation's roads.

The Highway Loss Data Institute,

founded in 1972, shares and supports this mission through scientific studies of insurance data representing the human and economic losses resulting from the ownership and operation of different types of vehicles and by publishing insurance loss results by vehicle make and model.

Both organizations are wholly supported by auto insurers.

IHS members write 85% of private passenger market

- Acceptance Insurance
- ACE Private Risk Services
- Affirmative Insurance
- Alfa Alliance Insurance Corporation
- Alfa Insurance
- Allstate Insurance Group
- American Family Mutual Insurance
- American National Property and Casualty Company
- Ameriprise Auto & Home
- Amica Mutual Insurance Company
- Auto Club Enterprises
- Auto Club Group
- Auto-Owners Insurance
- Aviva Insurance
- Bankers Insurance Group
- Bituminous Insurance Companies
- California Casualty Group
- California State Auto Group
- Capital Insurance Group
- Chubb & Son
- Colorado Farm Bureau Mutual Insurance Company
- Commonwealth Mutual Insurance Company of America
- Concord Group Insurance Companies
- COUNTRY Financial
- CSAA Insurance Group
- CSE Insurance Group
- Direct General Corporation
- Erie Insurance Group
- Esurance
- Farm Bureau Financial Services
- Farm Bureau Insurance of Michigan
- Farm Bureau Mutual Insurance Company of Idaho
- Farmers Insurance Group of Companies
- Farmers Mutual Hail Insurance Company of Iowa
- Farmers Mutual of Nebraska
- Florida Farm Bureau Insurance Companies
- Frankenmuth Insurance
- Freestone Insurance Company
- Gainsco Insurance
- GEICO Group
- The General Insurance
- Georgia Farm Bureau Mutual Insurance Company
- Goodville Mutual Casualty Company
- Grange Insurance
- Hallmark Insurance Company
- Hanover Insurance Group
- The Hartford
- Haulers Insurance Company, Inc.
- Horace Mann Insurance Companies
- ICW Group
- Imperial Fire & Casualty Insurance Company
- Indiana Farmers Mutual Insurance Company
- Infinity Property & Casualty
- Kemper Preferred
- Kentucky Farm Bureau Insurance
- Liberty Mutual Insurance Company
- Louisiana Farm Bureau Mutual Insurance Company
- Maryland Automobile Insurance Fund
- Mercury Insurance Group
- MetLife Auto & Home
- Michigan Millers Mutual Insurance Company
- MiddleOak
- Mississippi Farm Bureau Casualty Insurance Company
- MMG Insurance
- Mutual of Enumclaw Insurance Company
- Nationwide
- New Jersey Manufacturers Insurance Group
- Nodak Mutual Insurance Company
- Norfolk & Dedham Group
- North Carolina Farm Bureau Mutual Insurance Company
- Northern Neck Insurance Company
- Ohio Mutual Insurance Group
- Old American County Mutual Fire Insurance
- Old American Indemnity Company
- Oregon Mutual Insurance
- Pekin Insurance
- PEMCO Insurance
- Plymouth Rock Assurance
- Progressive Corporation
- QBE
- The Responsive Auto Insurance Company
- Rockingham Group
- Safe Auto Insurance
- Safeco Insurance
- Samsung Fire & Marine Insurance Company
- SECURA Insurance
- Sentry Insurance
- Shelter Insurance
- Sompo Japan Insurance Company of America
- South Carolina Farm Bureau Mutual Insurance Company
- Southern Farm Bureau Casualty Insurance Company
- State Auto Insurance Companies
- State Farm
- Tennessee Farmers Mutual Insurance Company
- Texas Farm Bureau Insurance Companies
- Tower Group Companies
- The Travelers Companies
- United Educators
- USAA
- Utica National Insurance Group
- Virginia Farm Bureau Mutual Insurance
- West Bend Mutual Insurance Company
- Western National
- Westfield Insurance
- XL Group plc
- Zurich North America

Where are we?

Location of IIHS/HLDI and Vehicle Research Center



Vision Zero

Adopted by the Swedish parliament in 1997,

“Vision Zero is a philosophy of road safety that eventually no one will be killed or seriously injured within the road transport system.”

-Claes Tingvall and Narelle Haworth, 1999

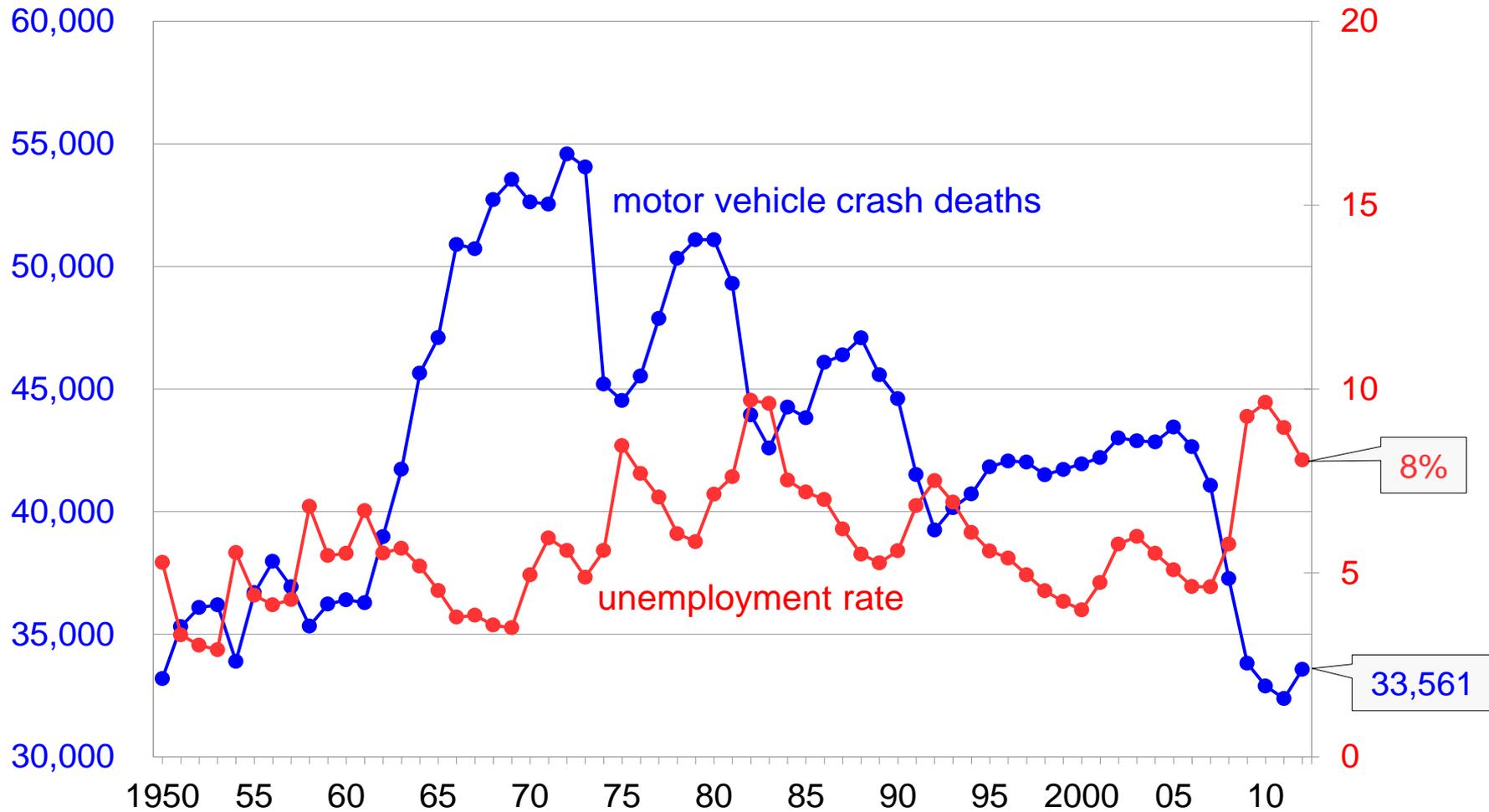
Haddon matrix shows many roads to Vision Zero

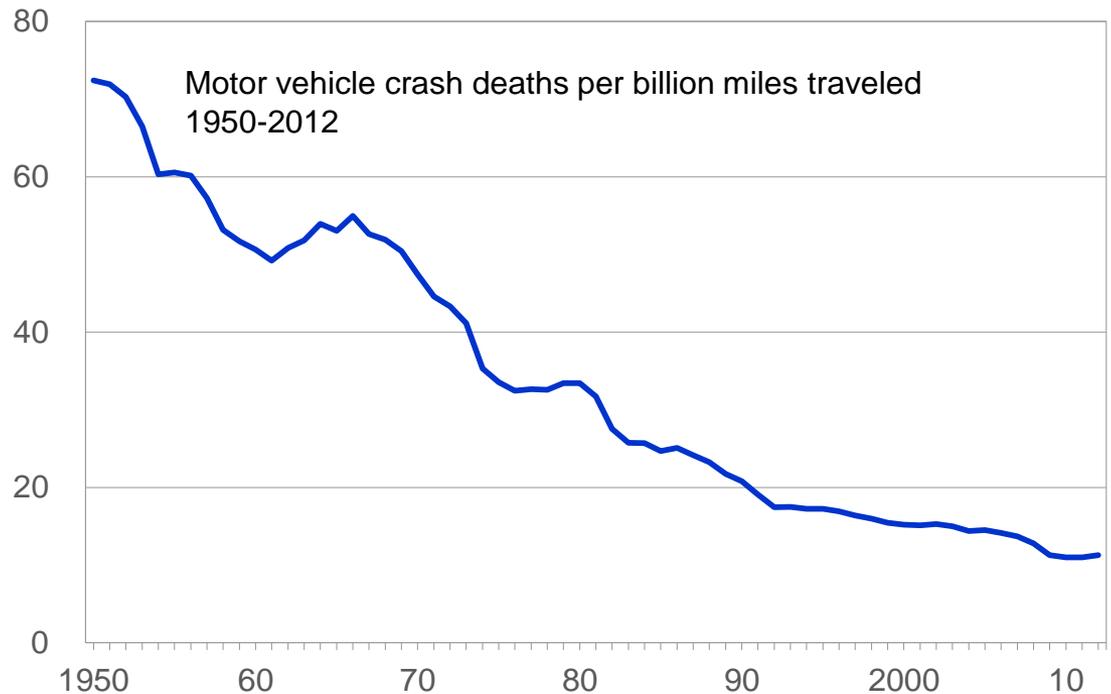
Recognizing opportunities to make a difference

changes in...	crash phase		
	before	during	after
people	<ul style="list-style-type: none"> •licensing laws •graduated licensing •impaired driving laws •red light cameras •speed camera 	<ul style="list-style-type: none"> •belt use •helmets •speed cameras 	<ul style="list-style-type: none"> •alcohol
vehicles	<ul style="list-style-type: none"> •lane departure warning •daytime running lights •electronic stability control 	<ul style="list-style-type: none"> •airbags •vehicle structure •bumpers 	<ul style="list-style-type: none"> •crash notification systems •fuel system integrity
environment	<ul style="list-style-type: none"> •roundabouts •trouble spot treatment •rumble strips 	<ul style="list-style-type: none"> •roundabouts •breakaway poles 	<ul style="list-style-type: none"> •emergency medical services

Motor vehicle crash deaths and unemployment rate

1950-2012

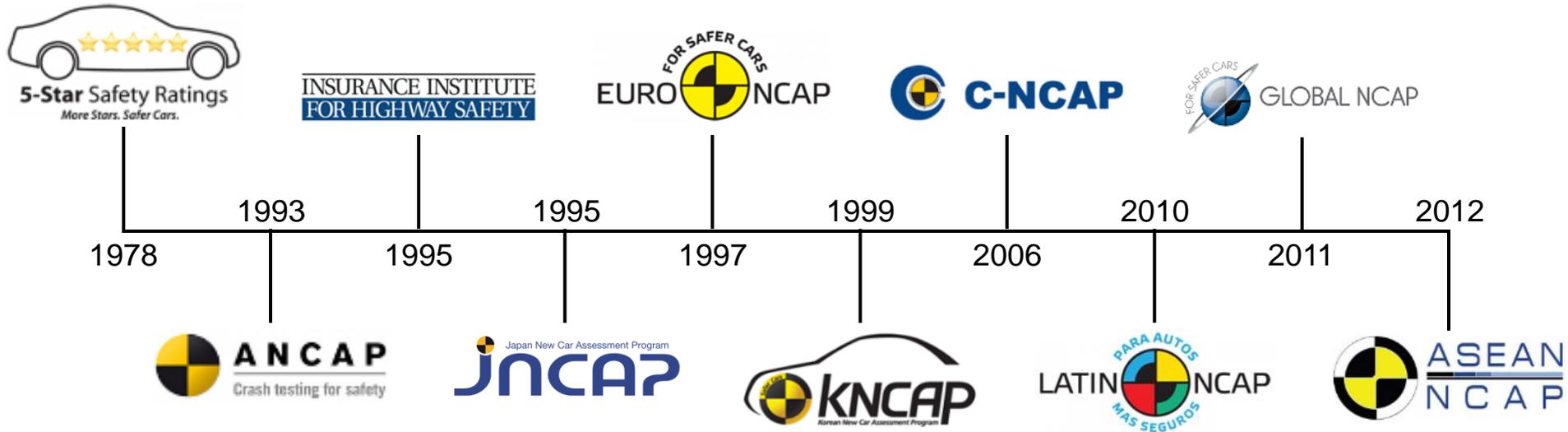




Vehicle improvements have been key to reductions in motor vehicle crash fatality risk

New car assessment programs (NCAPs)

By year of inception



IIHS *TOP SAFETY PICK* awards

Requirements for 2014



- G** Moderate overlap front
- G** or **A** Small overlap front
- G** Side impact
- G** Roof strength
- G** Rear impact



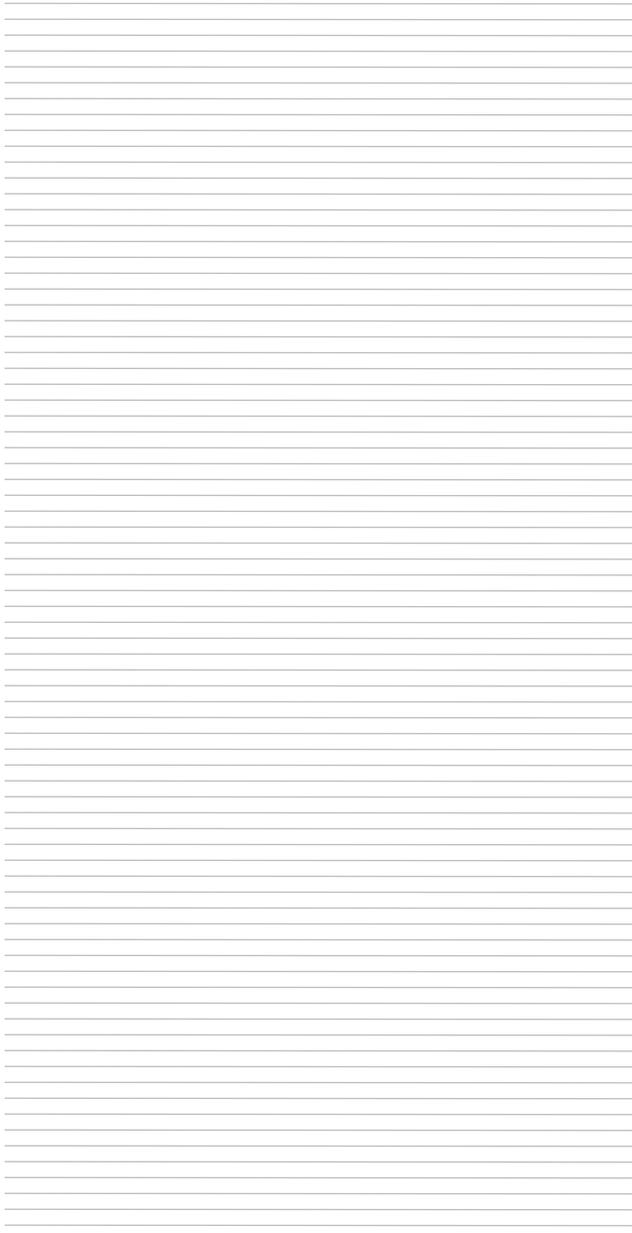
2014 *TOP SAFETY PICK*; AND
basic or better rating for **front crash prevention**

50th Anniversary crash test

1959 Bel Air vs. 2009 Malibu

The logo for the Insurance Institute for Highway Safety (IIHS) is centered on a black rectangular background. It consists of the words "INSURANCE INSTITUTE" in white, serif, all-caps font, positioned above a horizontal white line. Below the line, the words "FOR HIGHWAY SAFETY" are written in white, serif, all-caps font, set against a solid blue rectangular background.

INSURANCE INSTITUTE
FOR HIGHWAY SAFETY



Still a long road to Vision Zero

33,561 deaths in motor vehicle
crashes in 2012

A major obstacle on the road to Vision Zero: Driver error

- 1979 – Indiana “Tri-Level Study” estimated “driver error” to be “probable” cause of 9 out of 10 crashes
- Percentage of crashes where specific categories of driver error were judged to be a probable cause:
 - 23%: Improper lookout
 - 17%: Excessive speed
 - 15%: Inattention
 - 13%: Improper evasive action
 - 9%: Internal distraction
 - 9%: Improper driving technique
 - 9%: Inadequately defensive driving technique
 - 8%: False assumption
 - 6%: Improper maneuver
 - 6%: Overcompensation

Distraction-affected fatal crashes

Fatality Analysis Reporting System, 2012

- In 2012, there were 30,800 fatal crashes in which 33,561 people were killed
- At least one driver was coded as distracted in 3,050 fatal crashes (10% of all fatal crashes) in which 3,328 people were killed (10% of all fatalities)
- 3,119 drivers involved in a fatal crash were coded as distracted
- The following slide shows the percentage of drivers involved in a fatal crash who were coded as distracted by specific distractions

Distraction categories

Percentage of drivers involved in a fatal crash who were coded as distracted

Distraction/inattention/careless/lost in thought (Inattention, details unknown; Distraction, details unknown; Distraction/inattention; Careless/inattention; Distraction/careless; Inattentive or lost in thought)	63 (4)*
Cellular phone related (While talking or listening to cellular phone; While manipulating cellular phone; Other cellular phone related)	13 (1)*
Other (unlisted) distraction	8 (1)*
Outside person, object, or event	6
Other occupant	5
Using device/controls integral to the vehicle (While adjusting audio and/or climate controls; While using other device/controls integral to vehicle)	2
Using or reaching for device/object brought in vehicle	2
Eating or drinking	1
Smoking	<1
Moving object in vehicle	<1

*() = percent of all drivers in fatal crashes

Driver distractions



Changing lanes while texting



Using cellphone and eating

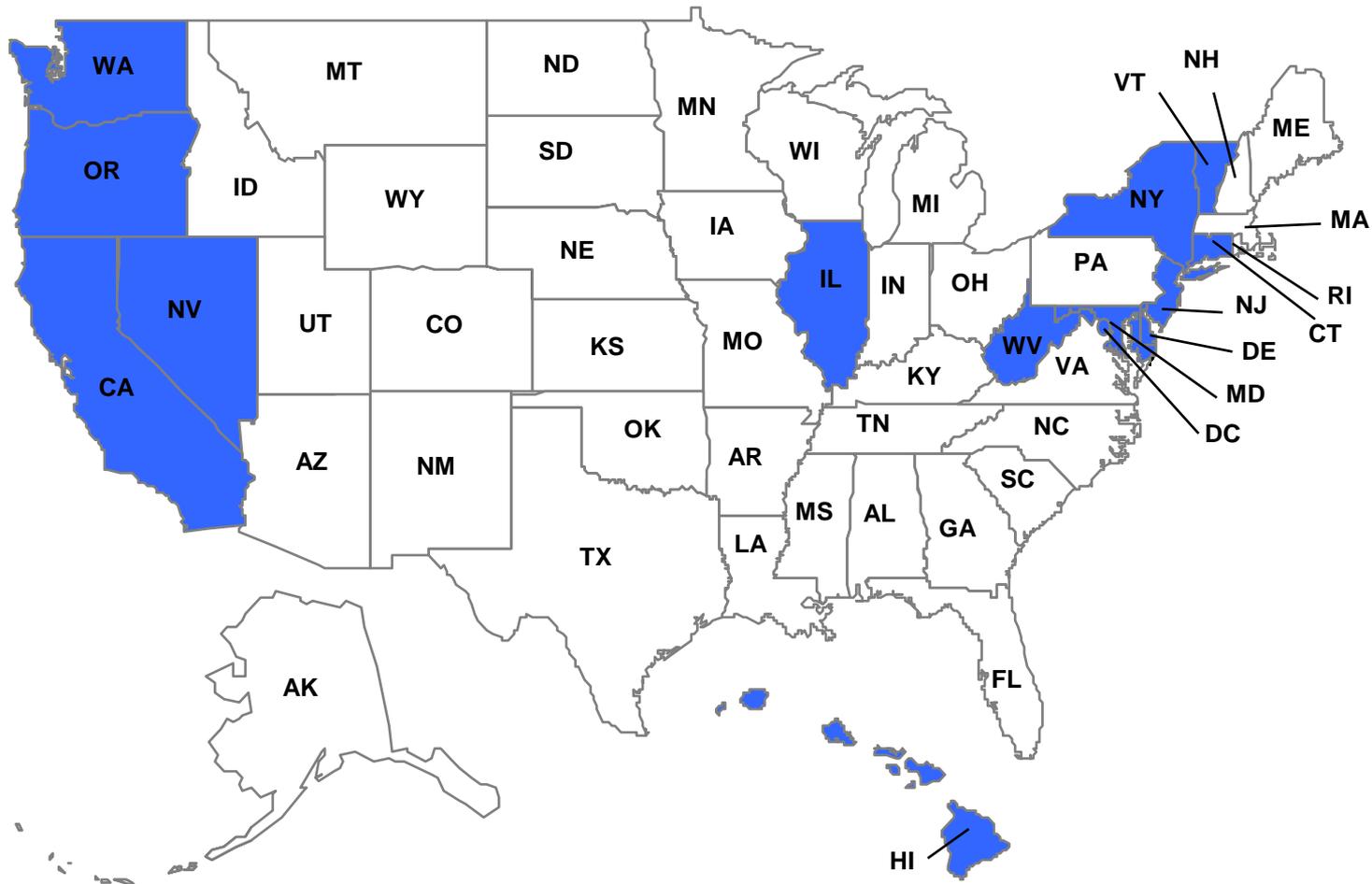


Speeding and texting



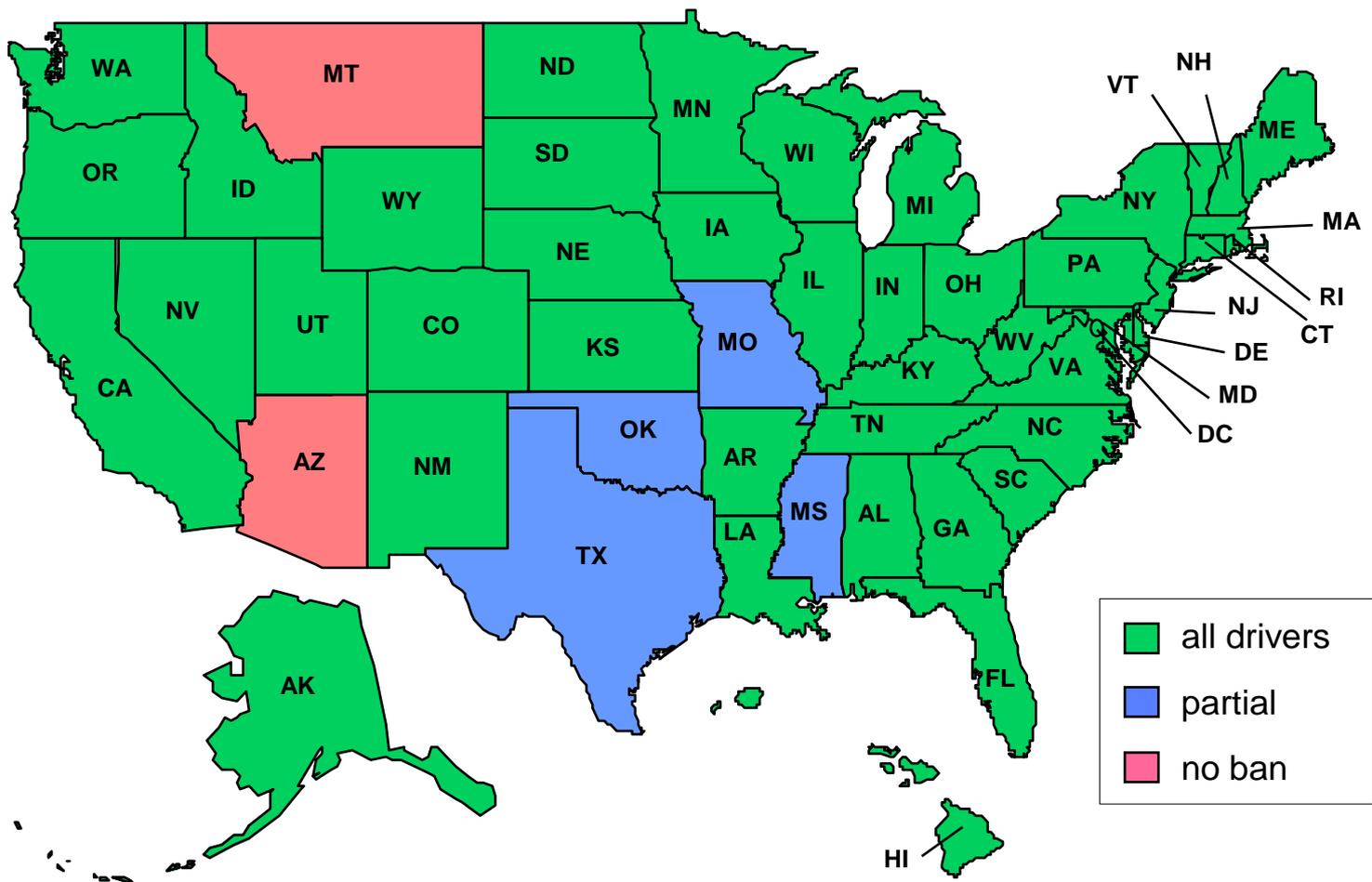
States that ban all drivers from talking on hand-held phones

October 2014



States that ban all drivers from texting

October 2014



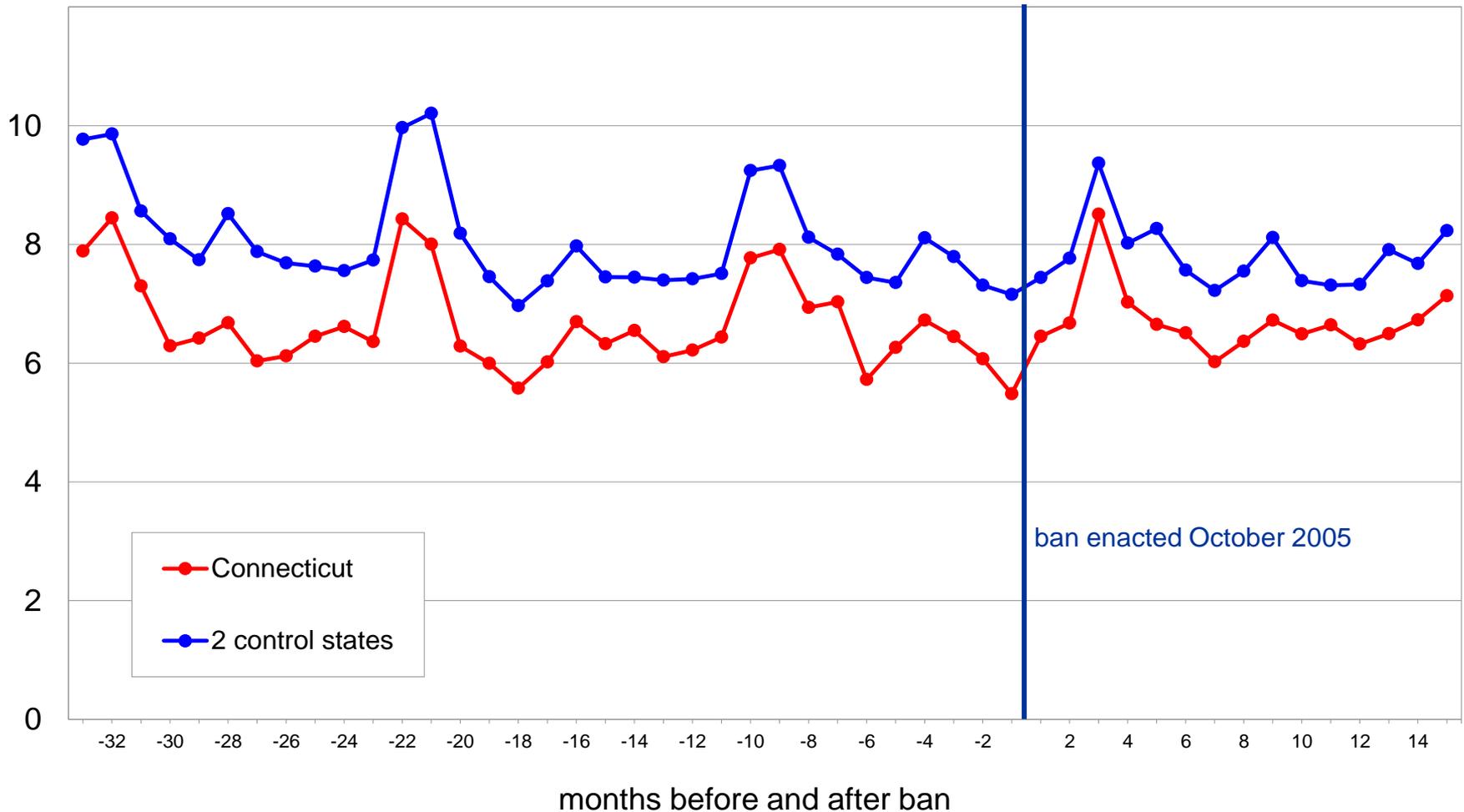
MOEyesontheRoad



#MOeyesonRD

Crashes and hand-held cellphone ban in Connecticut

Collision claim frequencies by month for vehicles up to 3 years old, Connecticut vs. New York and Massachusetts



Estimated effect of hand-held cellphone bans in 4 states

Collision claim frequencies for vehicles up to 3 years old

	estimated effect vs. control states	p-value
California	-1%	0.2635
Connecticut	+4%	0.0317
Washington DC (vs. MD and VA)	-5%	0.1753
New York	+3%	0.0052

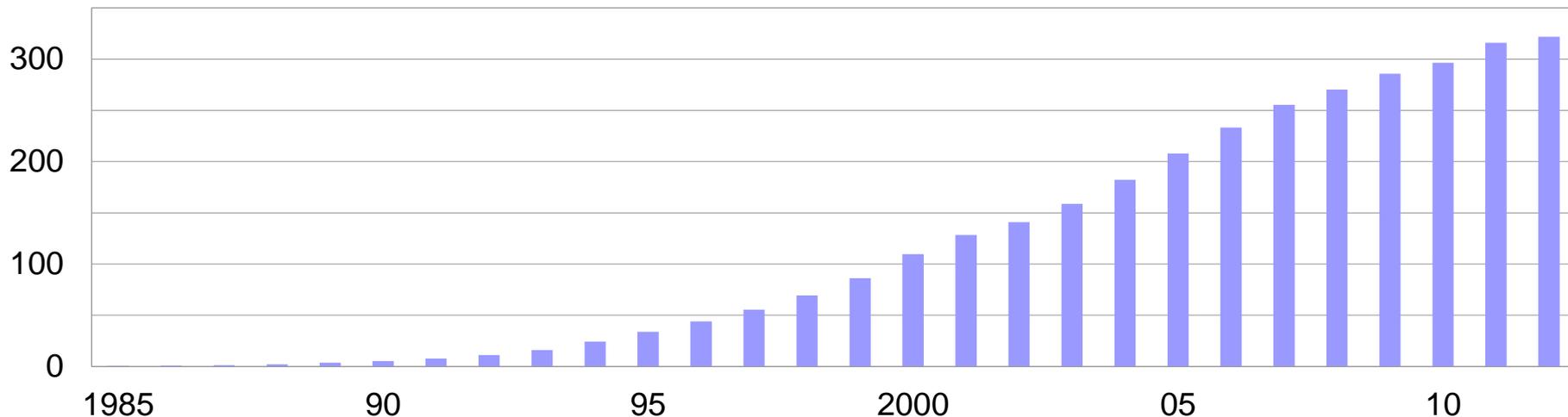
Estimated effect of texting bans in 4 states

Collision claim frequencies for vehicles up to 9 years old

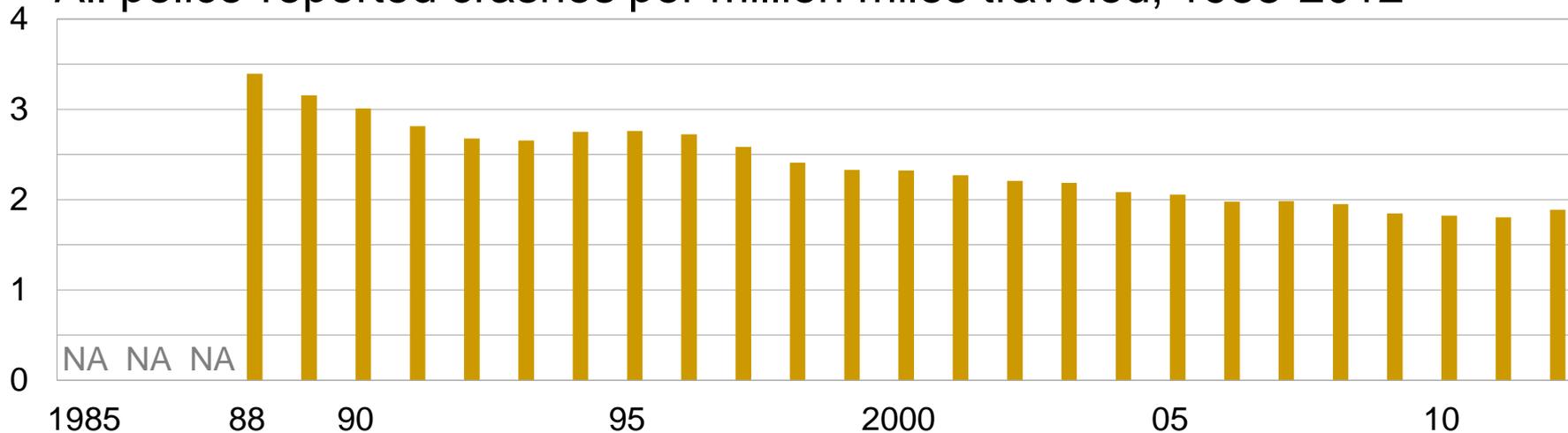
	estimated effect vs. control states	p-value
California	+8%	0.0001
Louisiana	+7%	0.0001
Minnesota	+9%	0.0001
Washington	+1%	0.4425

Despite increased phone use, crash rates are down

Cellphone subscribers in millions, 1985-2012



All police-reported crashes per million miles traveled, 1988-2012



Crashes still occur for people distracted by phones



Safety-critical event risk increases with manipulation of hand-held devices

Fitch et al., 2013

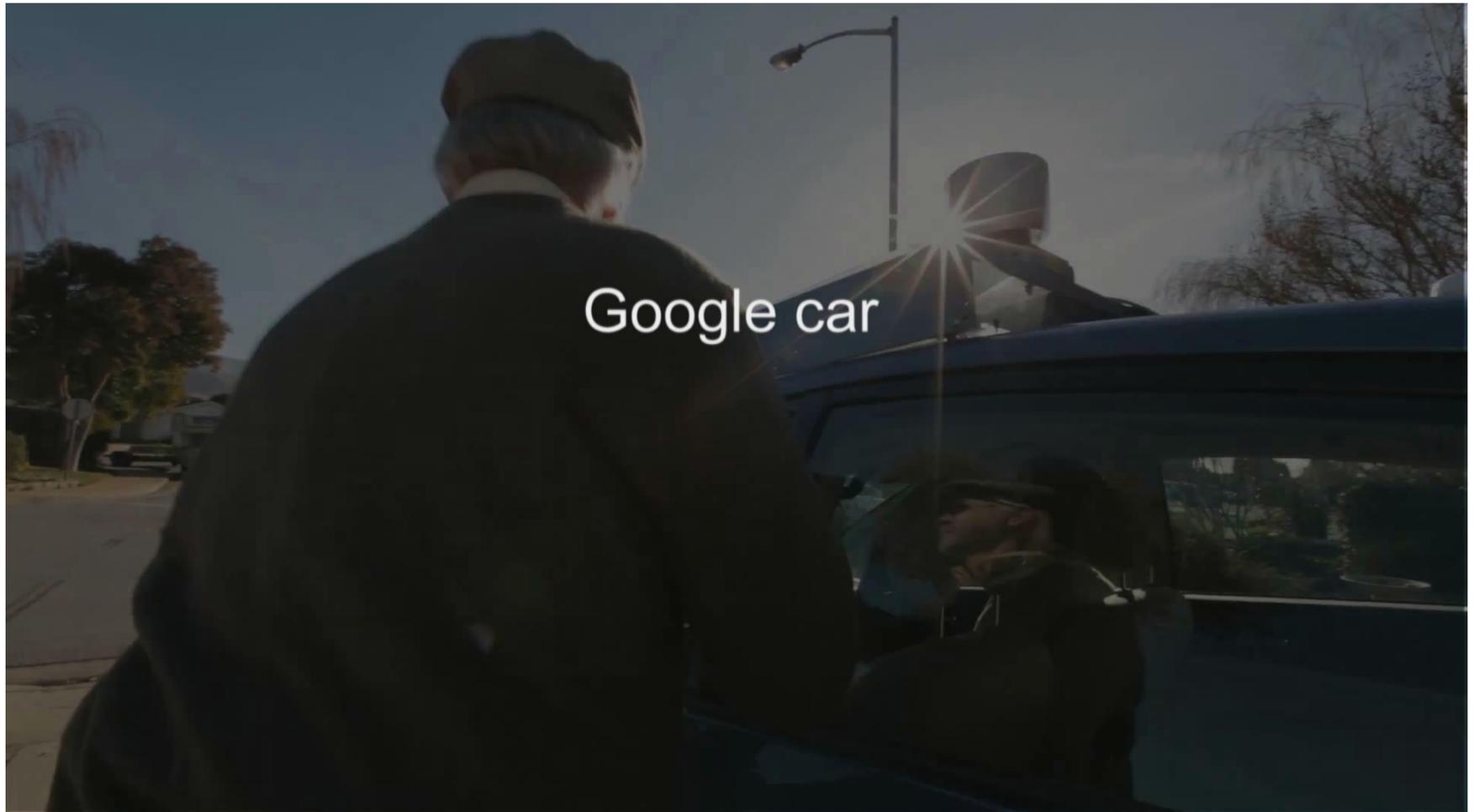
	risk rate ratio	odds ratio
All cellphone use	1.3	1.1
All visual-manual cellphone use (including visual-manual interactions with hands-free devices)	2.9	1.7
Text-related visual-manual or text messaging/browsing	2.1	1.7
Talking/listening on cell phone	0.8	0.8



Can new crash avoidance
technology help?

The Google vision

Autonomous vehicles delivering occupants to pre-set destinations

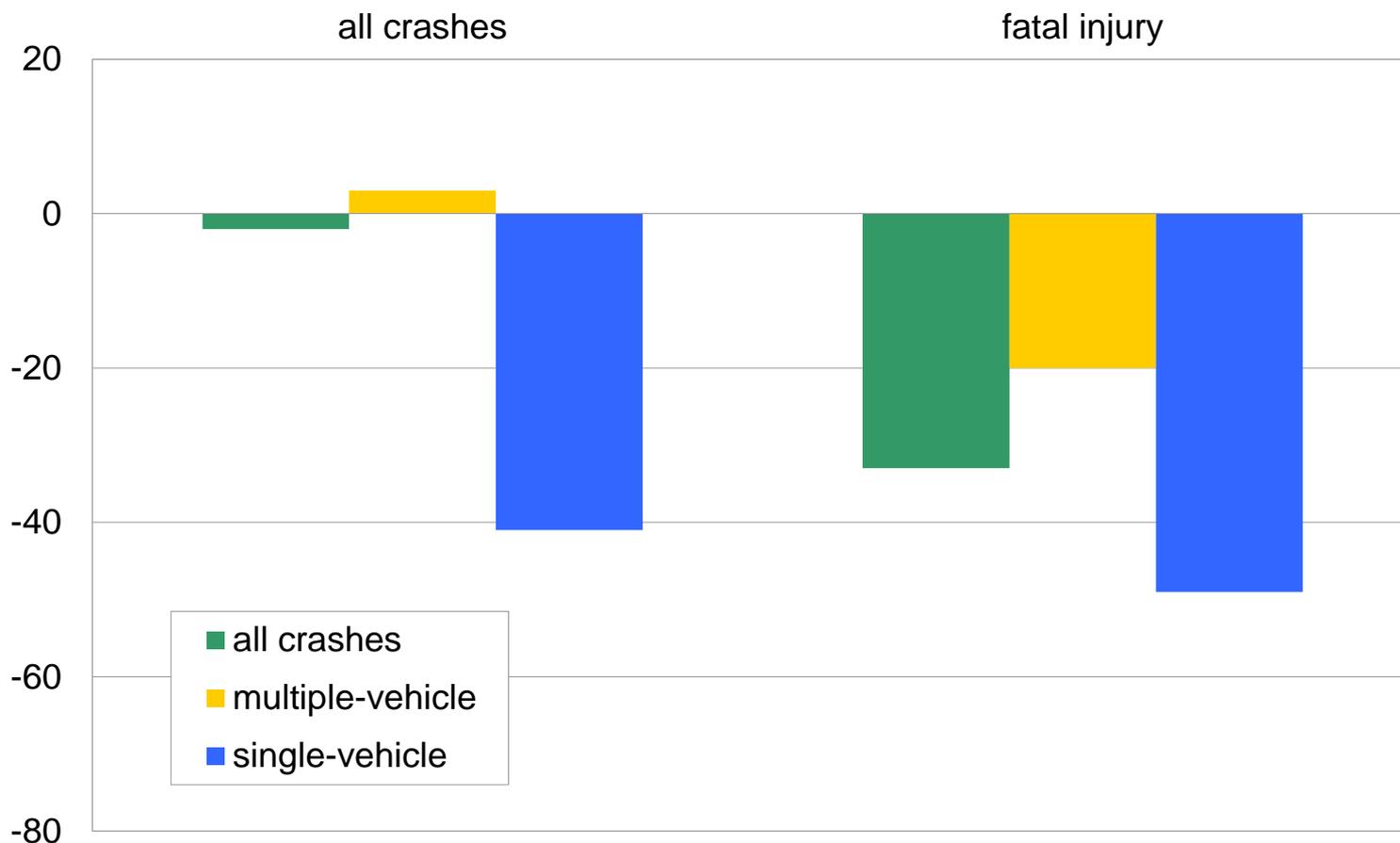


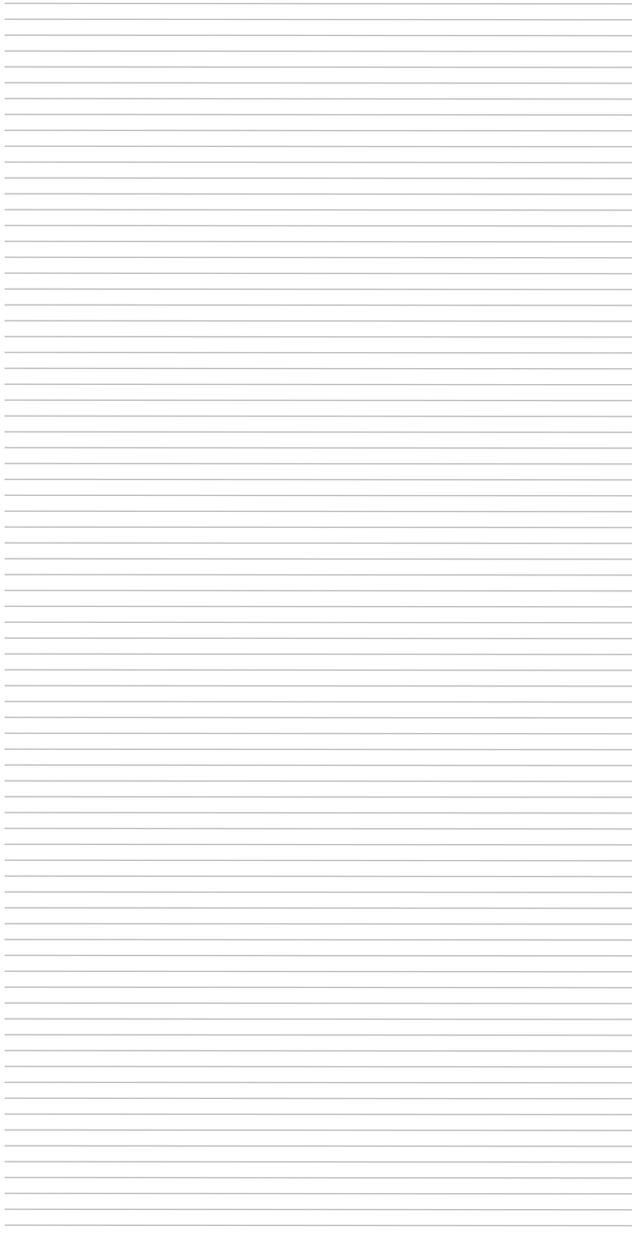
Vehicles without and with ESC



Effects on crash risk

Percent change in crash rates for vehicles with standard ESC vs. optional or no ESC, updated May 2010





Front crash prevention systems
are reducing front to rear crashes

Front crash prevention

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Autobrake performance tests

25 mi/h



Subaru Outback
with EyeSight



Mercedes-Benz
E350 with
Distronic Plus

Benefits of Autobrake: Mercedes-Benz C-Class into Chevrolet Malibu at 25 and 12 mi/h



25 mph

\$28,131

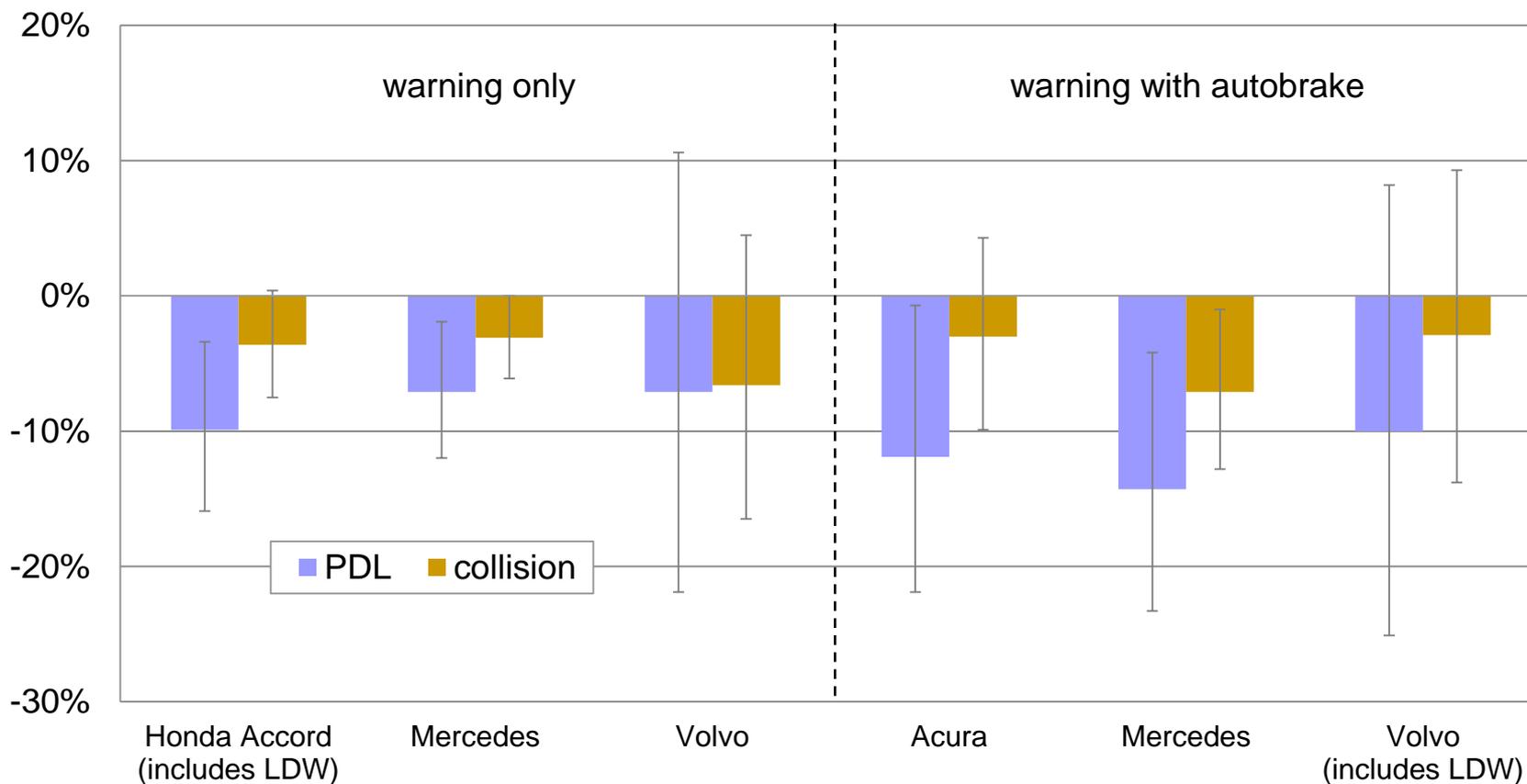


12 mph

\$5,715

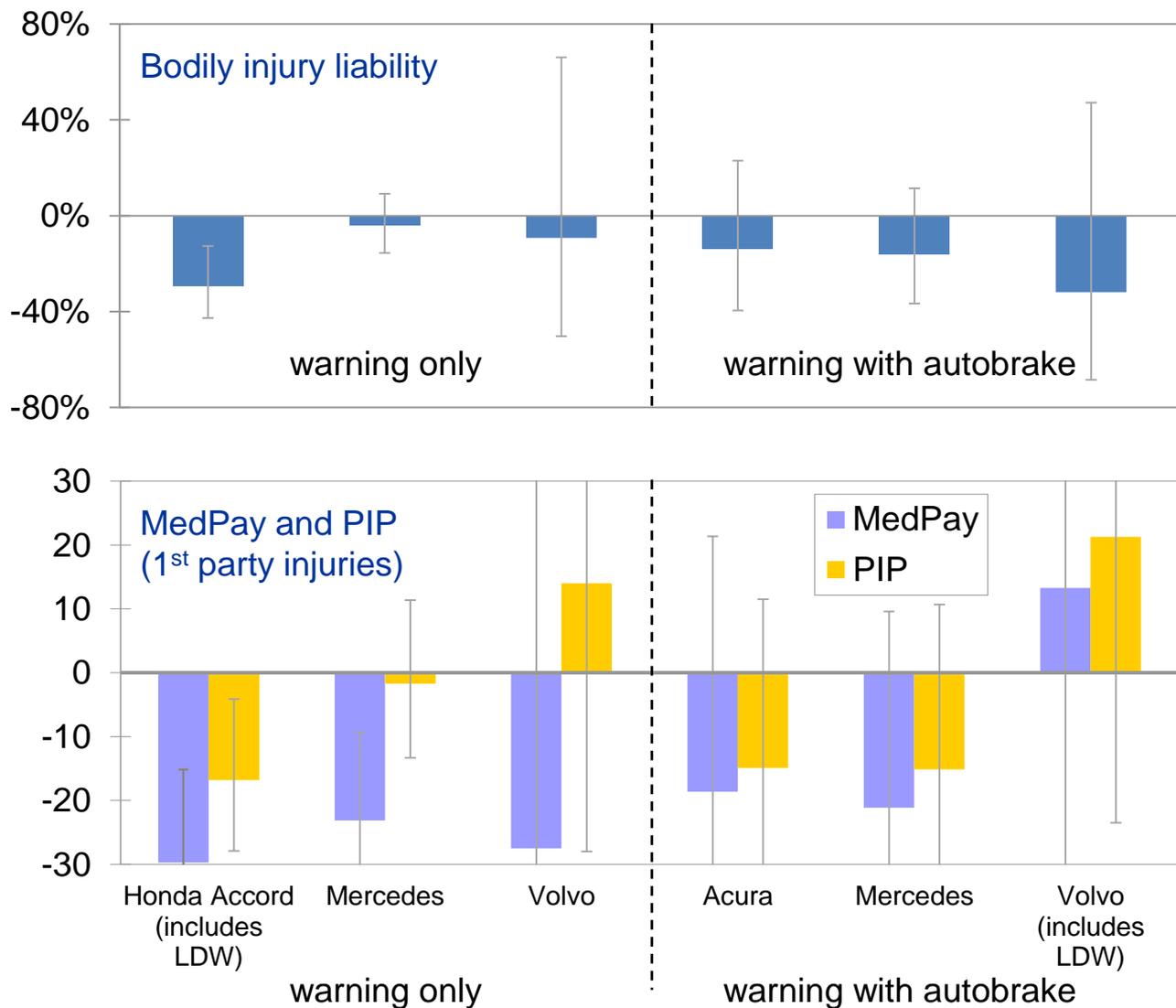
Higher speed front crash prevention systems

Percent change in vehicle damage claims per insured vehicle year



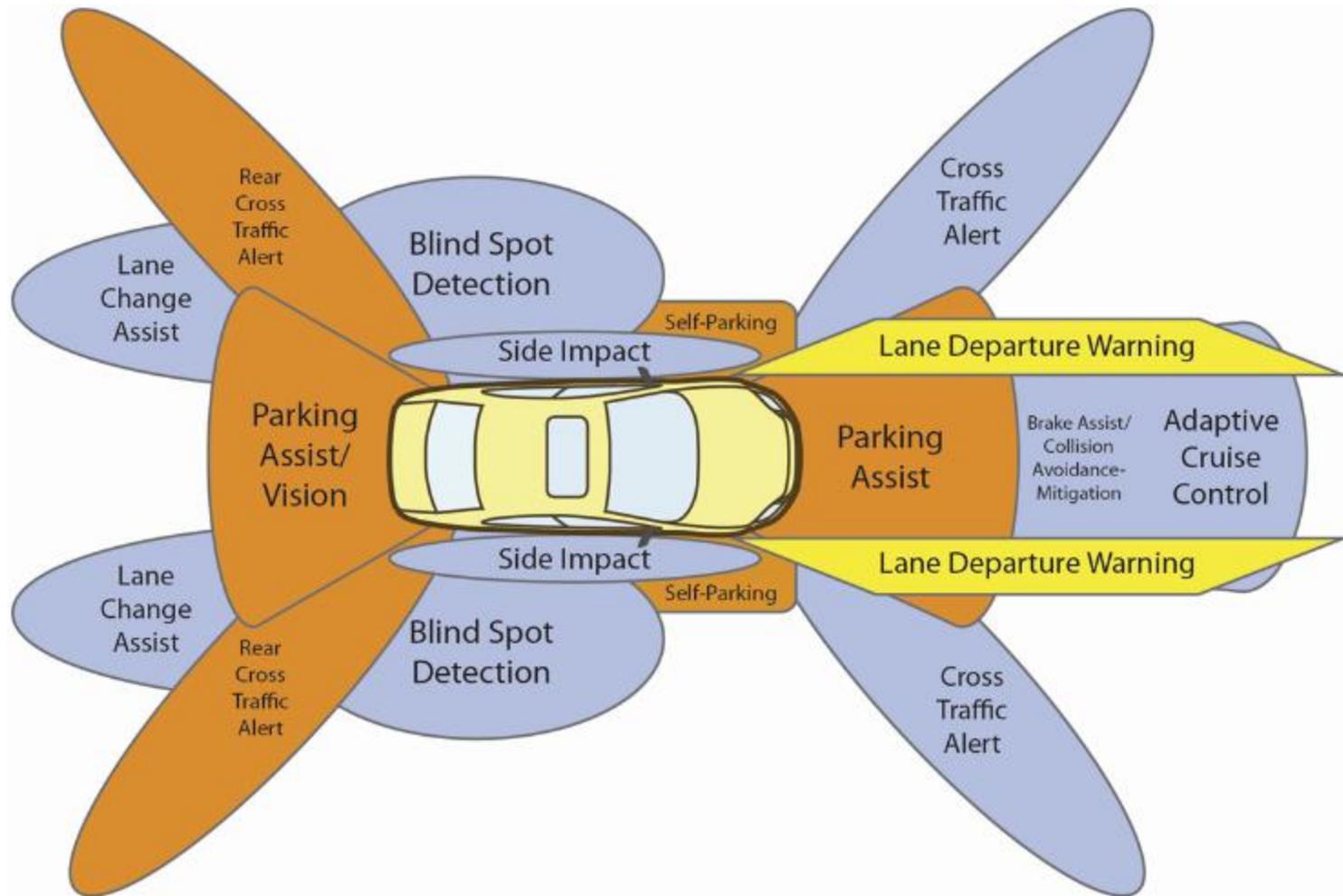
Higher speed front crash prevention systems

Changes in injury claim frequency per insured vehicle year



Driver assistance features

Radar, LIDAR, ultrasonic, infrared, cameras, GPS

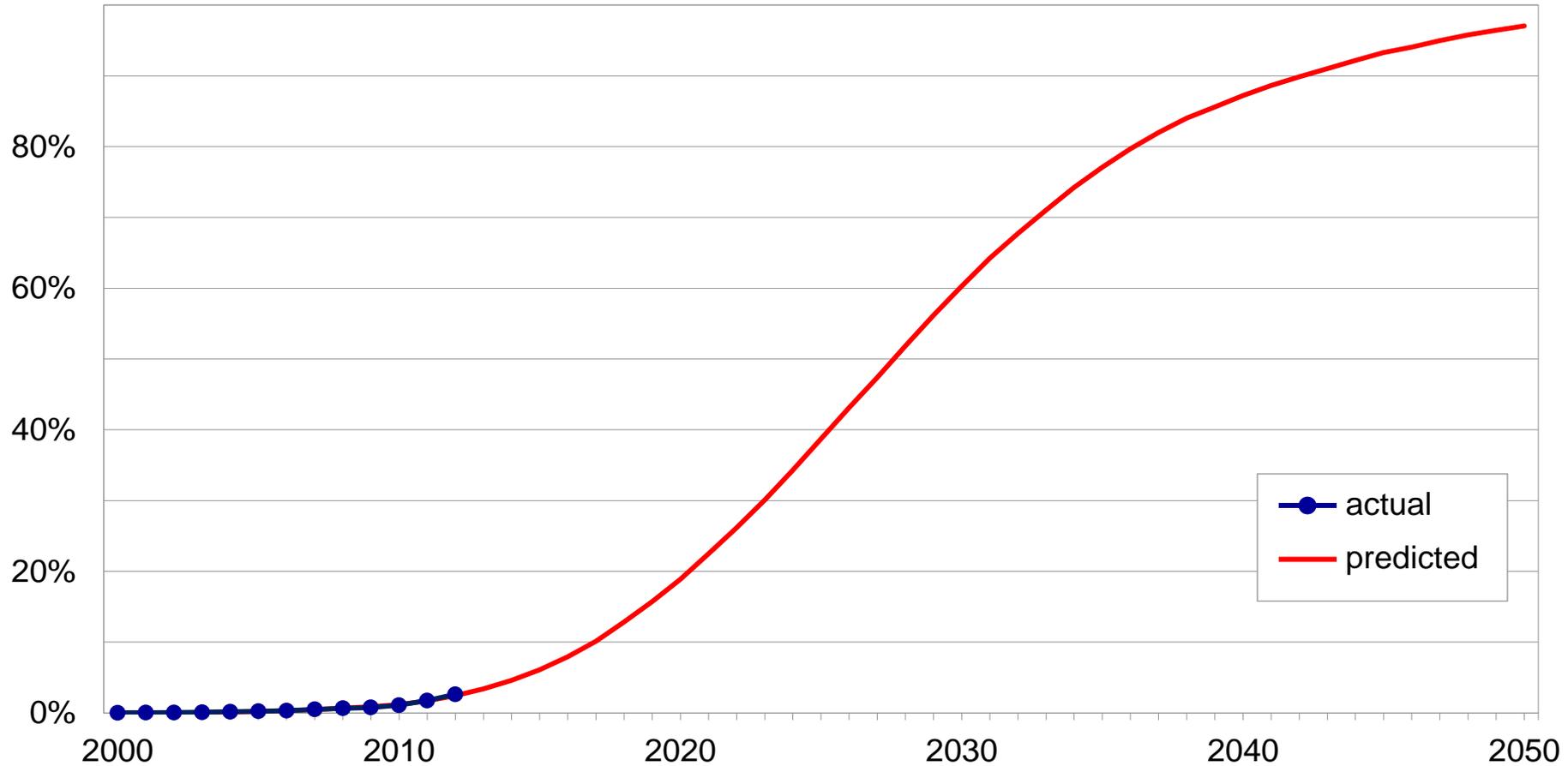


The impact of advanced driver assist systems on insurance (and safety) will occur gradually as technology penetrates the fleet

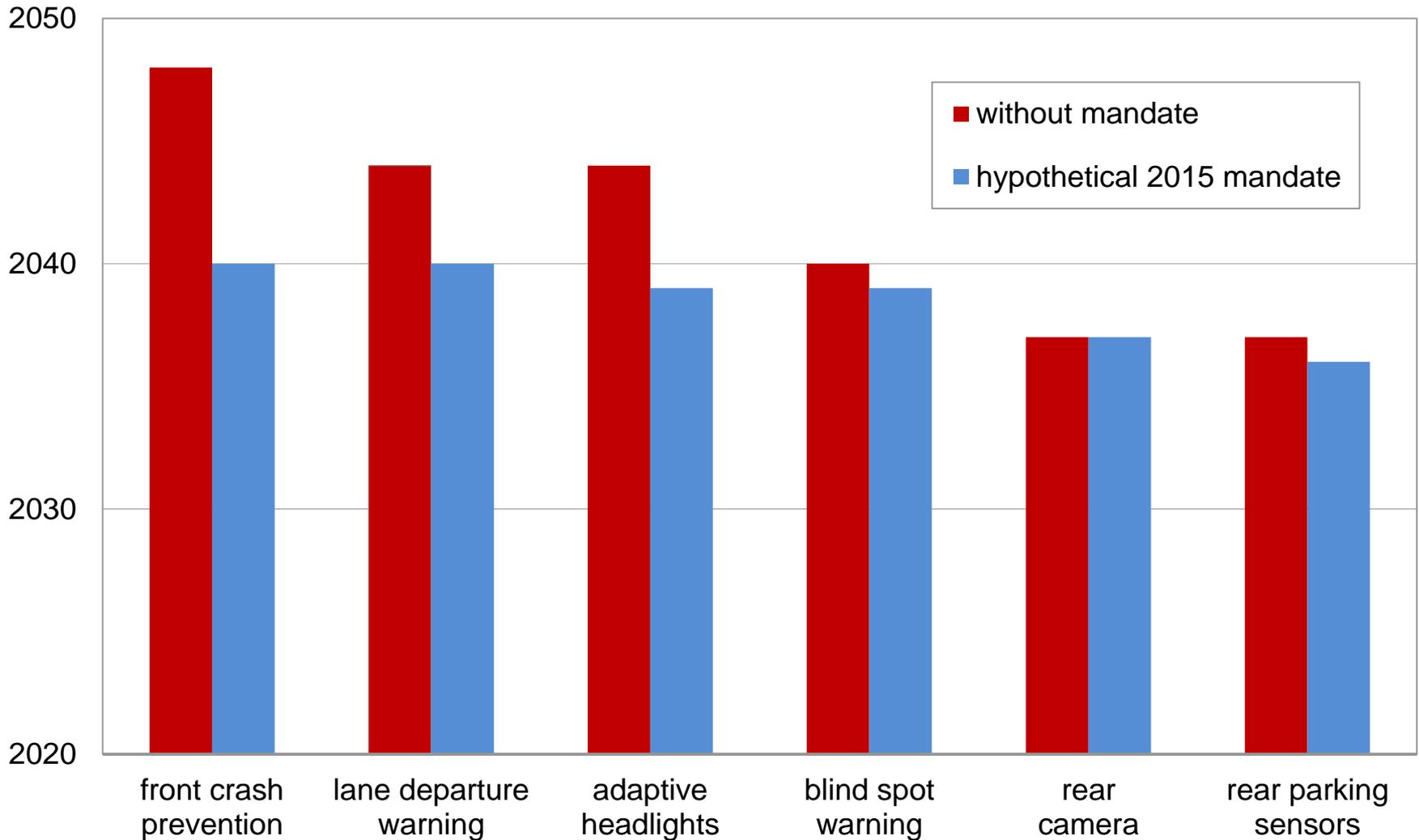


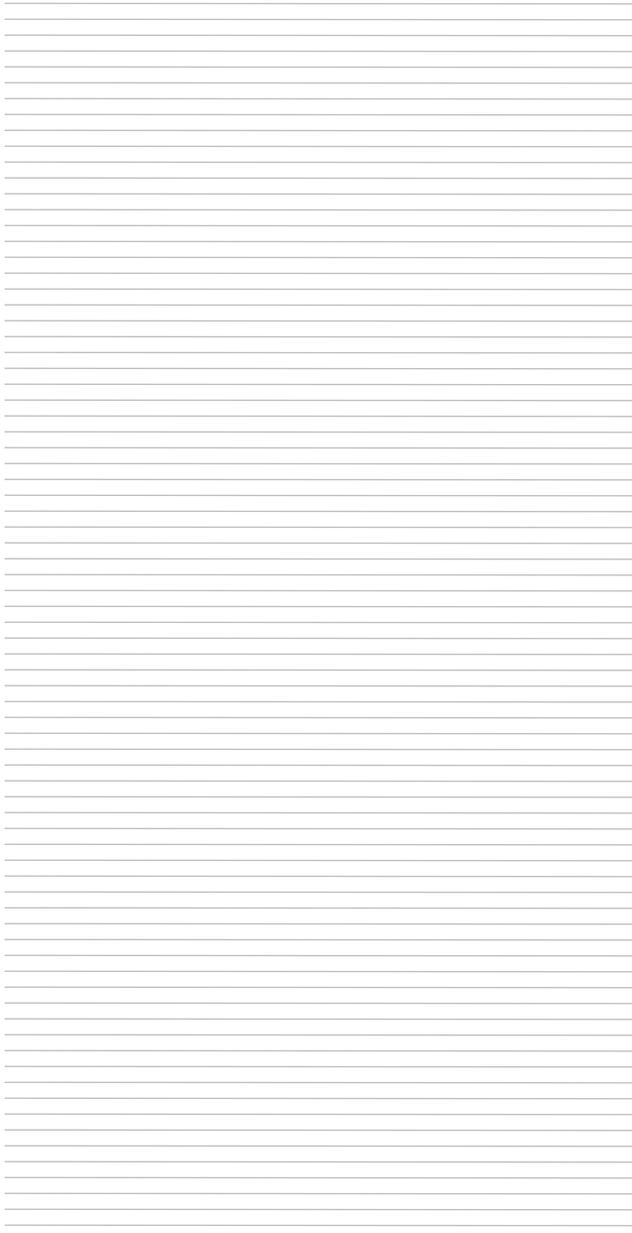
Registered vehicles with forward collision warning, actual and predicted

By calendar year



Calendar year features reach 95% of registered vehicles with and without hypothetical mandate





In the meantime, there are other actions we can take to achieve Vision Zero that can mitigate driver distraction and error

STATUS REPORT

INSURANCE INSTITUTE
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LOW-HANGING FRUIT

Oftentimes saving a life on the road is as basic as getting people to slow down, buckle up, or don a helmet. Tried and true countermeasures like these usually don't grab headlines, but if they were more widely propagated across the nation they would yield an immediate reduction in motor vehicle crash deaths.

The number of people who die in crashes in the United States is at a record low. Still, there were an estimated 32,788 motor vehicle crash deaths last year, according to a preliminary projection by the National Highway Traffic Safety Administration (NHTSA).

Vehicles are safer than ever, and emerging technologies

August 2011

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Low-hanging fruit

- Roundabouts
- Primary safety belt use laws
- Mandatory helmet use for all motorcyclists
- Strengthen graduated driver licensing laws
- Lower speed limits
- Automated enforcement of red light running and speeding
- Sobriety checkpoints

These are proven countermeasures that can reduce deaths and injuries on our highways as soon as implemented.

Video on roundabouts

If 10 percent of signalized intersections in the United States were converted to roundabouts

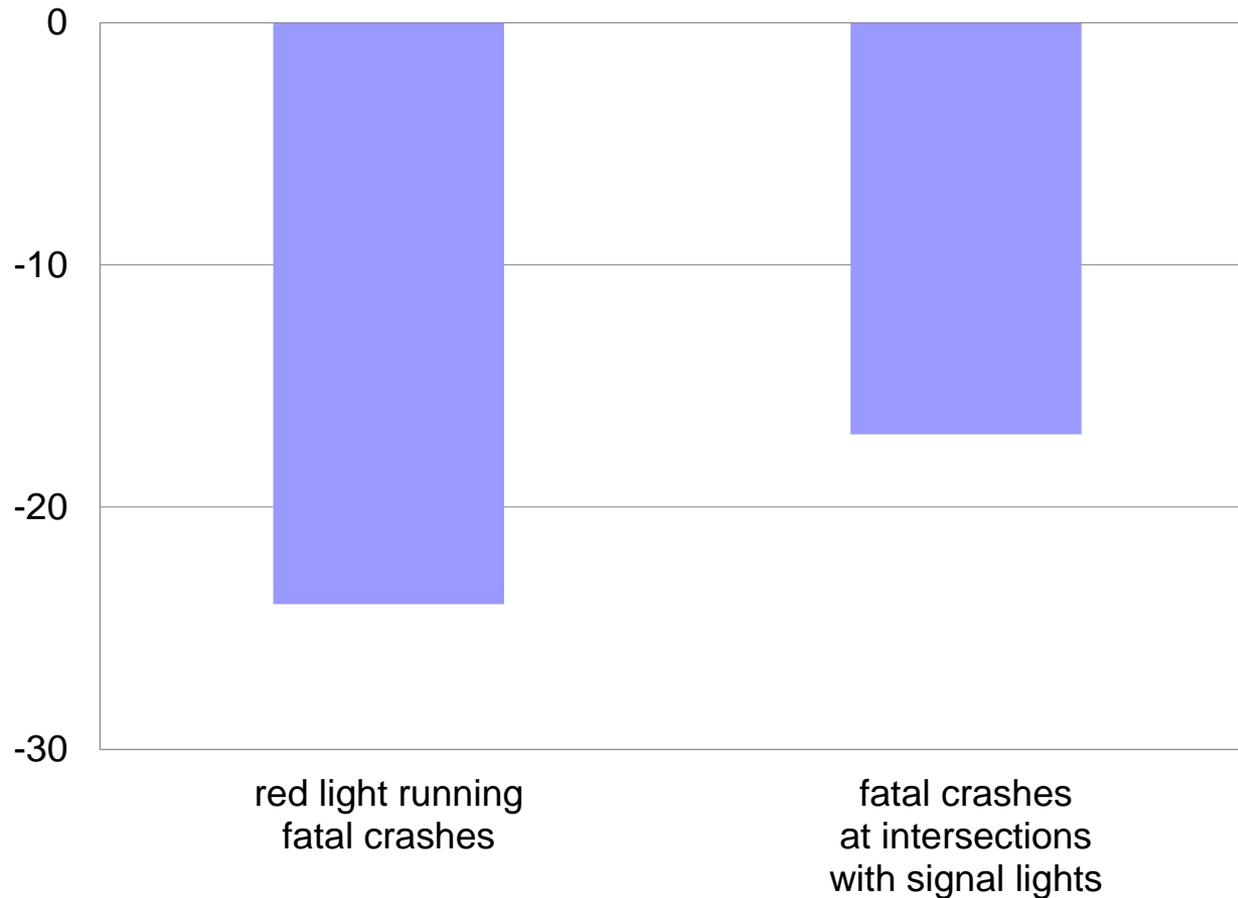
- Approximately 46,000 crashes prevented in 2012 including:
 - 184 fatal crashes
 - 31,000 injury crashes
- Vehicle delays reduced by more than 900 million hours
- Fuel consumption reduced by more than 600 million gallons

Fatalities in red light running crashes

2011

	number
Driver in red light running vehicle	247
Passenger in red light running vehicle	83
Occupants non-red light running vehicle	341
Pedestrian, bicyclist and personal conveyance	43
TOTAL	714

Percent difference in actual fatal crash rates during 2004-08 in 14 large cities with red light cameras vs. expected rates without cameras



Driver fails to stop for red traffic light



We need to be resourceful in addressing the many forms of distraction that lead to crashes

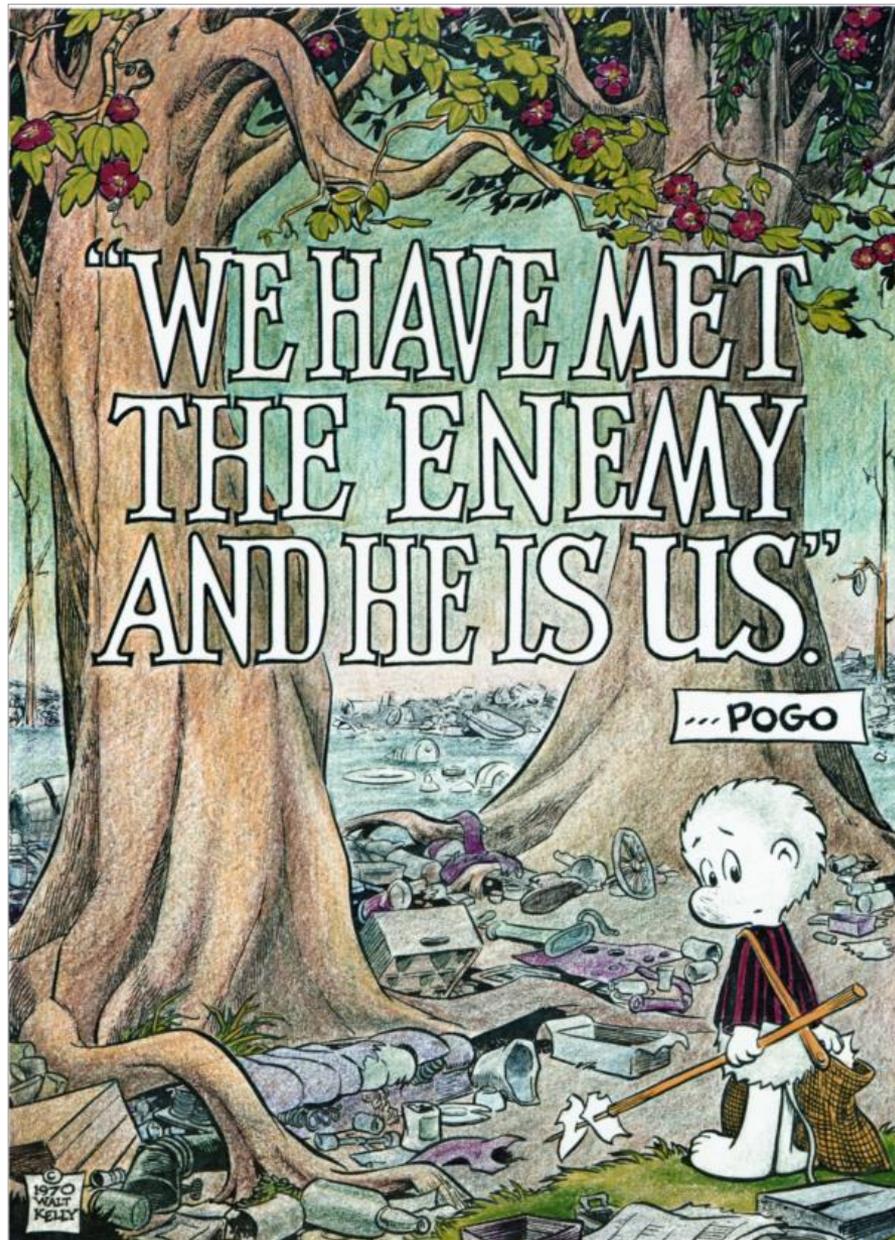


Mind wandering and multi-tasking

A final thought

“We developed a smartphone technology to sample people’s ongoing thoughts, feelings, and actions and found (i) that people are thinking about what is not happening almost as often as they are thinking about what is and (ii) found that doing so typically makes them unhappy.”

- *A Wandering Mind is an Unhappy Mind*
Killingsworth, M.A. and Gilbert, D.T. 2010
Science, 330, 932





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Dedicated to reducing deaths, injuries,
and property damage on the highway