Risky Driving Behaviors

NHTSA Safety Research Portfolio Public Meeting: Fall 2021

October 20, 2021

2020 Fatality Data Show Increased Traffic Fatalities During Pandemic

- Estimated 38,680 people died in traffic crashes in 2020
  - 7.2% increase in fatalities over 2019
  - Largest number since 2007
- More fatalities even though fewer vehicle miles traveled
  - Decrease of 13.2% miles over same period in 2020
- Increases in crashes associated with risky behaviors
  - Unrestrained occupants of passenger vehicles up 15%
  - In speeding-related crashes up 11%
  - In police-report alcohol involvement crashes up 9%

Sources:
https://www.nhtsa.gov/press-releases/2020-fatality-data-show-increased-traffic-fatalities-during-pandemic

National Center for Statistics and Analysis. (2021, June (revised)). Early estimates of motor vehicle traffic fatalities and fatality rate by sub-categories in 2020 (Crash Stats Brief Statistical Summary. Report No. DOT HS 813 118). National Highway Traffic Safety Administration.

NHTSA Releases Q1 2021 Fatality Estimates

- Estimated 8,730 people died in traffic crashes in the first three months of 2021
- 10.5% increase in fatalities over same period in 2020
- More fatalities even though fewer vehicle miles traveled
    - Decrease of 2.1% miles over same period in 2020

Sources:
https://www.nhtsa.gov/press-releases/2020-fatality-data-show-increased-traffic-fatalities-during-pandemic

National Center for Statistics and Analysis. (2021, August). Early estimate of motor vehicle traffic fatalities for the first quarter of 2021 (Crash Stats Brief Statistical Summary. Report No. DOT HS 813 149). National Highway Traffic Safety Administration.

Panel Presentations

1. **Traffic Safety During the COVID-19 Public Health Emergency** – Amy Berning
2. **Reducing Electronic Device Use While Driving** – Jordan Blenner
3. **Traits, Attitudes, and Beliefs Related to Belt Use** – Christine Watson
4. **Behavioral Approaches in Motorcyclist Safety** – Kathryn Wochinger

Traffic Safety During the COVID-19 Public Health Emergency

Amy Berning

Population Staying at Home per Day

Select a Frequency
- Daily
- Weekly
- Monthly

Select a Metric: Population Staying at Home

Select a State: (None)

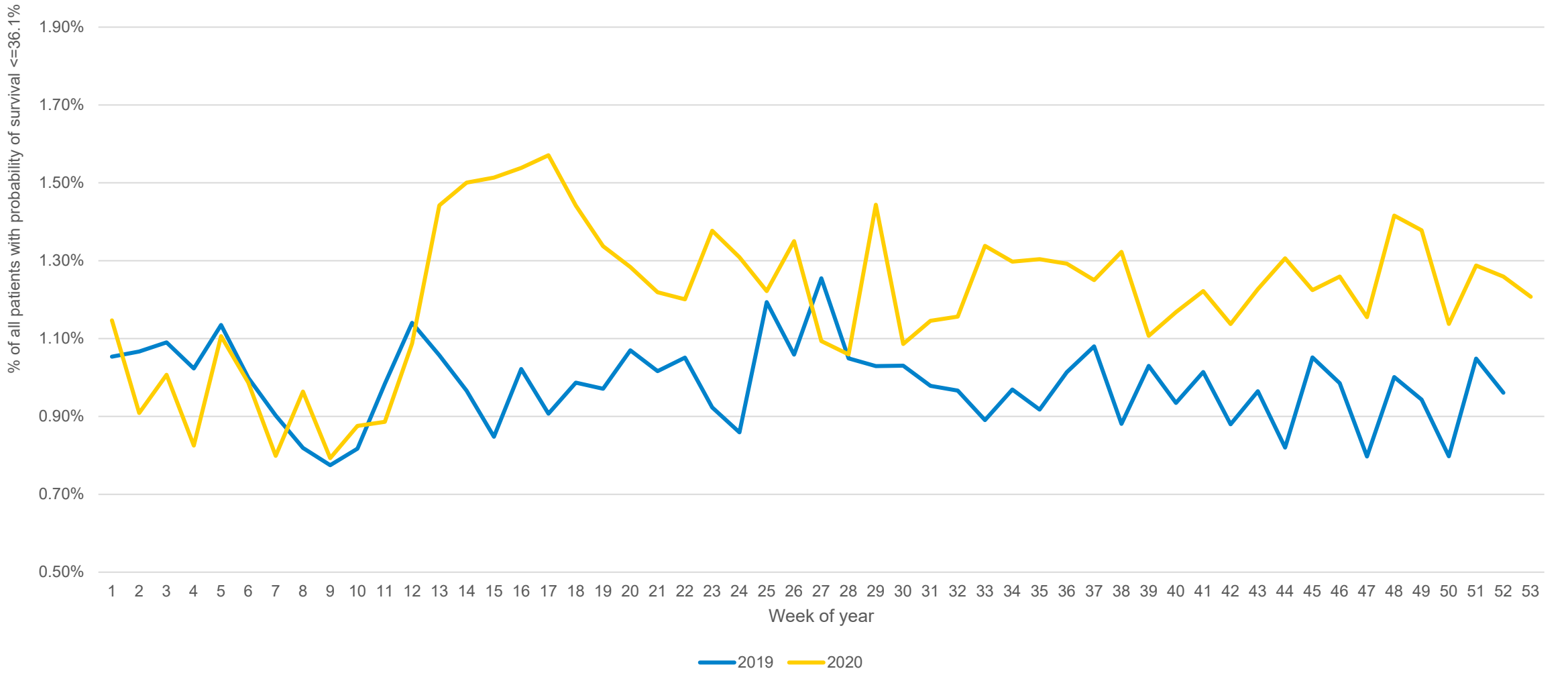
Source: U.S. Department of Transportation, Bureau of Transportation Statistics, Trips by Distance, https://data.bts.gov/Research-and-Statistics/Trips-by-Distance/w96p-f2qv

Table 1: Fatalities and Fatality Rate by Quarter, Full Year, and the Percentage Change From the Corresponding Quarter or Full Year in the Previous Year

Quarter	1st Quarter (Jan–Mar)	2nd Quarter (Apr–Jun)	3rd Quarter (Jul–Sep)	4th Quarter (Oct–Dec)	Total (Full Year)
Fatalities and Percentage Change in Fatalities for the Corresponding Quarter From the Prior Year					
2009	7,552 [-10.7%]	8,975 [-4.9%]	9,104 [-8.5%]	8,252 [-13.9%]	33,883 [-9.5%]
2010	6,755 [-10.6%]	8,522 [-5.0%]	9,226 [+1.3%]	8,496 [+3.0%]	32,999 [-2.6%]
2011	6,726 [-0.4%]	8,227 [-3.5%]	8,984 [-2.6%]	8,542 [+0.5%]	32,479 [-1.6%]
2012	7,521 [+11.8%]	8,612 [+4.7%]	9,171 [+2.1%]	8,478 [-0.7%]	33,782 [+4.0%]
2013	7,166 [-4.7%]	8,207 [-4.7%]	9,024 [-1.6%]	8,496 [+0.2%]	32,893 [-2.6%]
2014	6,856 [-4.3%]	8,179 [-0.3%]	8,799 [-2.5%]	8,910 [+4.9%]	32,744 [-0.5%]
2015	7,370 [+7.5%]	8,823 [+7.9%]	9,805 [+11.4%]	9,486 [+6.5%]	35,484 [+8.4%]
2016	8,154 [+10.6%]	9,563 [+8.4%]	10,078 [+2.8%]	10,011 [+5.5%]	37,806 [+6.5%]
2017	8,301 [+1.8%]	9,460 [-1.1%]	10,081 [+0.0%]	9,631 [-3.8%]	37,473 [-0.9%]
2018	8,203 [-1.2%]	9,323 [-1.4%]	9,934 [-1.5%]	9,375 [-2.7%]	36,835 [-1.7%]
2019	7,816 [-4.7%]	9,172 [-1.6%]	9,953 [+0.2%]	9,155 [-2.3%]	36,096 [-2.0%]
2020†	7,900 [+1.1%]	9,120 [-0.6%]	11,305 [+13.6%]	10,355 [+13.1%]	38,680 [+7.2%]
2021†	8,730 [+10.5%]	—	—	—	—
Fatality Rate per 100 Million Vehicle Miles Traveled (VMT)					
2009	1.09	1.16	1.17	1.12	1.15
2010	0.98	1.09	1.18	1.14	1.11
2011	0.98	1.09	1.18	1.17	1.10
2012	1.08	1.12	1.21	1.16	1.14
2013	1.04	1.07	1.17	1.16	1.10
2014	0.99	1.03	1.11	1.17	1.08
2015	1.03	1.08	1.20	1.21	1.15
2016	1.11	1.16	1.23	1.27	1.19
2017	1.12	1.13	1.21	1.20	1.17
2018	1.10	1.11	1.18	1.15	1.14
2019	1.05	1.08	1.17	1.12	1.11
2020†	1.12	1.46	1.49	1.41	1.37
2021†	1.26	—	—	—	—

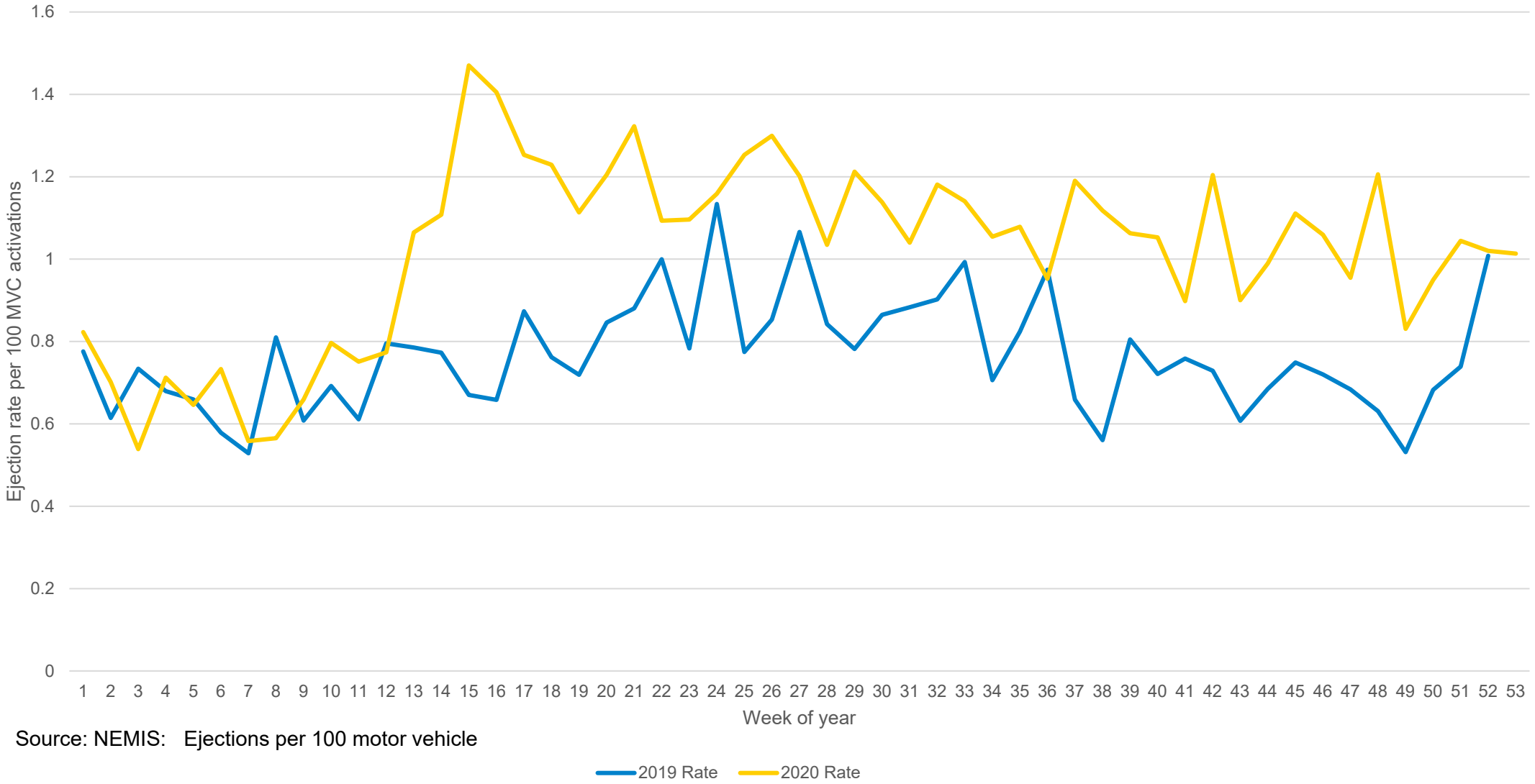
Sources: Fatalities: 2009–2018 FARS Final File, 2019 FARS Annual Report File; VMT: FHWA March 2021 Traffic Volume Trends for 2020 and 2021 VMT
†2020 and 2021 statistical projections and rates based on these projections.

Percent of Severely Injured Motor Vehicle Crash Patients



Source: NEMSIS Percent of patients in a crash with a probability of survival ≤ 36%

Ejections per Emergency Medical Services Motor Vehicle Crash Activations



Source: NEMIS: Ejections per 100 motor vehicle

Drug and Alcohol Prevalence in Seriously and Fatally Injured Road Users

- Examine *prevalence* of legal and illegal drugs in drivers and other road users who are seriously- or fatally-injured and present directly to selected Level 1 trauma centers and to morgues.
  - Drivers, Passengers, Pedestrians, Bicyclists, Motorcyclists, Scooter Riders
- Data Collection began late 2019; Staggered start across sites
- Trauma centers began halting data collection as only “essential research” then allowed during the public health emergency.
- Spring 2020 we revised protocol and partnered with National Institutes of Health
  - Used leftover blood to test for SARS-CoV-2 antibodies.
- Toxicology results compared before and during the public health emergency.

UMass Memorial Center Worcester, MA

R Adams Cowley Shock Trauma Center Baltimore, MD

Carolinas Medical Center Charlotte, NC

UF Health Trauma One Jacksonville, FL

Ryder Trauma Center Miami, FL

University of Iowa Health Care – Iowa City, IA

UC Davis Health, Sacramento, CA

NHTSA's Drug and Alcohol Prevalence in Seriously and Fatally Injured Road Users

Road Users

- Drivers
- Passengers
- Pedestrians
- Bicyclists
- Motorcyclists
- Scooters

Crash Outcomes

- Serious Injury
- Fatality

Research Partners

- Level 1 Trauma Centers
- Medical Examiners

Blood already collected by medical staff

De-Indentified

Forensic Toxicology Lab

- Testing for ~ 70 drugs
  - over-the-counter
  - prescription
  - illegal

National Institutes of Health

- Testing for Covid-19

Dunlap and Associates, Inc.

~ 7,5000 Cases

Drivers: Positive for Drug Category by Year's Quarter

	End of 2019 Q4 2019 (N=409)		Begin 2020 / Early COVID Q1 2020 (N=536)		Quarter 2 Q2 2020 (N=404)		Quarter 3 Q3 2020 (N=603)		Quarter 4 2020 Q4 2020 (N=474)	
Drug Category	n	%	n	%	n	%	n	%	n	%
Alcohol	90	22.0	137	25.6	102	25.2	166	27.5	127	26.8
Cannabinoids	78	19.1	118	22.0	133	32.9[A,B]	155	25.7	130	27.4[A]
Stimulants	36	8.8	60	11.2	41	10.1	64	10.6	42	8.9
Sedatives	42	10.3	35	6.5	34	8.4	48	8.0	33	7.0
Opioids	28	6.8	52	9.7	60	14.9[A]	88	14.6[A]	44	9.3
Antidepressants	11	2.7	12	2.2	1	0.2[A]	4	0.7	4	0.8
Over-the-Counter	4	1.0	22	4.1	6	1.5	10	1.7	8	1.7
Other Drugs	7	1.7	9	1.7	3	0.7	17	2.8	10	2.1
At Least 1 Category	211	51.6	292	54.5	260	64.4[A,B]	366	60.7[A]	266	56.1
Multiple Categories	69	16.9	120	22.4	92	22.8	150	24.9[A]	108	22.8

https://rosap.ntl.bts.gov/view/dot/56125

[A] Significantly different ($p < .05$) compared to Q4 2019 period.
[B] Significantly different ($p < .05$) compared to Q1 2020 period.

Motorcyclists: Positive for Drug Category by Quarter

Drug Category	Q4 2019 (N=61)		Q1 2020 (N=111)		Q2 2020 (N=137)		Q3 2020 (N=213)		Q4 2020 (N=125)	
	n	%	n	%	n	%	n	%	n	%
Alcohol	11	18.0	21	18.9	42	30.7	63	29.6	31	24.8
Cannabinoids	14	23.0	30	27.0	50	36.5	61	28.6	35	28.0
Opioids	2	3.3	4	3.6	7	5.1	19	8.9	7	5.6
Stimulants	6	9.8	5	4.5	8	5.8	19	8.9	11	8.8
Sedatives	2	3.3	7	6.3	7	5.1	22	10.3	6	4.8
Antidepressants	0	0.0	0	0.0	1	0.7	3	1.4	1	0.8
Over-the-Counter	0	0.0	1	0.9	0	0.0	0	0.0	0	0.0
Other Drugs	2	3.3	0	0.0	4	2.9	8	3.8	5	4.0
At Least 1 Category	27	44.3	51	45.9	85	62.0	135	63.4[B]	72	57.6
Multiple Categories	7	11.5	15	13.5	28	20.4	49	23.0	18	14.4

[B] Significantly different ($p < .05$) compared to Q1 2020.

https://rosap.ntl.bts.gov/view/dot/56125

Pedestrians: Positive for Drug Category by Quarter

	Q4 2019 (N=106)		Q1 2020 (N=162)		Q2 2020 (N=105)		Q3 2020 (N=172)		Q4 2020 (N=144)	
	n	%	n	%	n	%	n	%	n	%
Alcohol	20	18.9	46	28.4	31	29.5	53	30.8	36	25.0
Cannabinoids	23	21.7	27	16.7	31	29.5	38	22.1	34	23.6
Stimulants	10	9.4	23	14.2	16	15.2	21	12.2	14	9.7
Sedatives	9	8.5	14	8.6	10	9.5	19	11.0	14	9.7
Opioids	9	8.5	10	6.2	13	12.4	23	13.4	25	17.4[B]
Antidepressants	3	2.8	2	1.2	1	1.0	2	1.2	1	0.7
Over-the-Counter	2	1.9	6	3.7	4	3.8	4	2.3	2	1.4
Other Drugs	4	3.8	1	0.6	1	1.0	6	3.5	4	2.8
At Least 1 Category	52	49.1	86	53.1	68	64.8	108	62.8	88	61.1
Multiple Categories	16	15.1	35	21.6	29	27.6	44	25.6	34	23.6

https://rosap.ntl.bts.gov/view/dot/50940

[B] Significantly different ($p < .05$) compared to Q1 2020 period.

Motorcyclists: Helmet Use by Quarter

	Q4 2019 (N=57)		Q1 2020 (N=105)		Q2 2020 (N=122)		Q3 2020 (N=205)		Q4 2020 (N=117)	
	n	%	n	%	n	%	n	%	n	%
Helmet Use	44	77.2	69	65.7	93	76.2	141	68.8	68	58.1[C]

https://rosap.ntl.bts.gov/view/dot/56125

[C] Significantly different ($p < .05$) from Q2 2020.

Note: Cases with unknown helmet use are excluded from this table and analysis.

Driver Seat Belt Use Before and During COVID (through September 2020)

	Before COVID (N=809)			3/17/20 – 7/18/20 (N=388)			7/19/20 – 9/30/20 (N=356)	
Belt Use	n	%		n	%		n	%
Belted	632	78.1		278	71.6 [A]		266	74.7
Unbelted	177	21.9		110	28.4 [A]		90	25.3

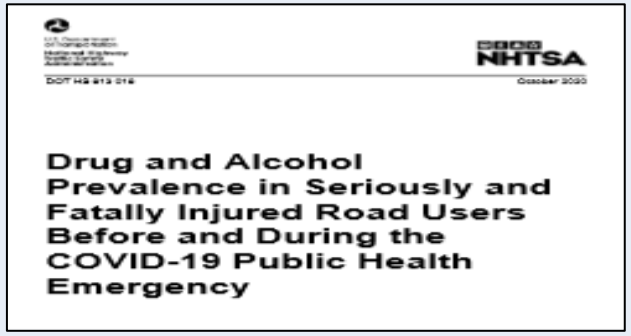
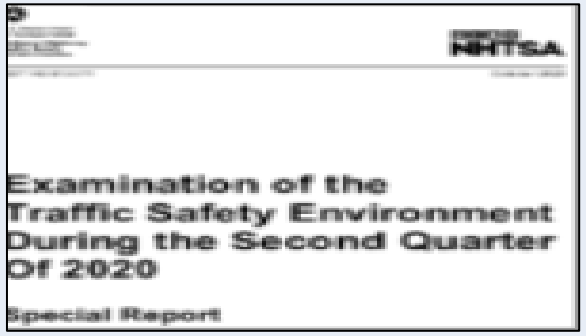
https://rosap.ntl.bts.gov/view/dot/50940

Drivers' BAC Ranges

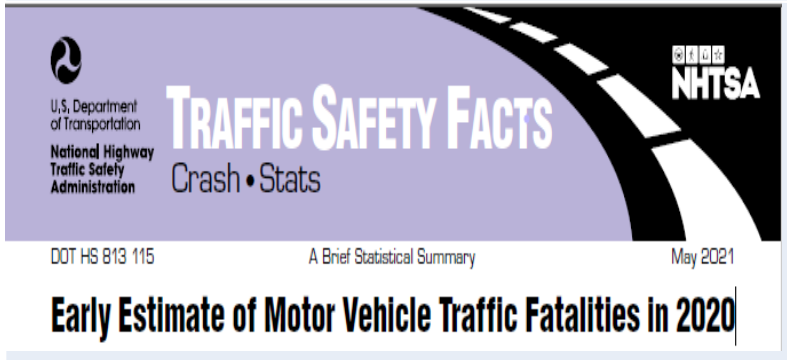
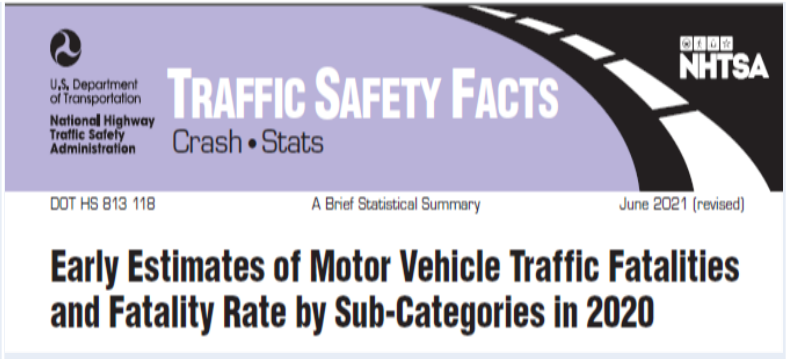
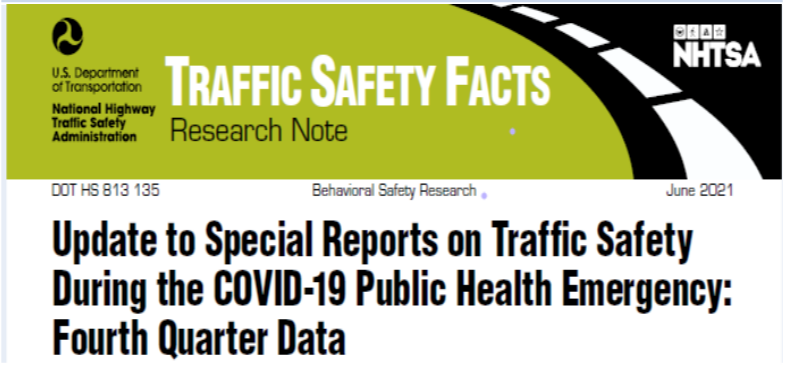
	Before COVID (N= 1,157)			March 17 to July 18 2020 (N=699)			July 19 to September 30 2020		
BAC Range (in g/dL)	n	%	95% CI	n	%	95% CI	n	%	95% CI
.00 (No Alcohol)	905	78.2	[75.8, 80.5]	501	71.7[A]	[68.2, 74.9]	453	70.8[A]	[67.2, 74.2]
.02 - .049	9	0.8	[0.4, 1.4]	14	2.0	[1.2, 3.2]	16	2.5[A]	[1.5, 3.9]
.05 - .079	22	1.9	[1.2, 2.8]	13	1.8	[1.0, 3.1]	7	1.1	[0.5, 2.1]
.08 - .149	64	5.5	[4.3, 7.0]	44	6.3	[4.7, 8.3]	45	7.0	[5.2, 9.2]
.15 +	157	13.6	[11.7, 15.6]	127	18.2[A]	[15.4, 21.2]	119	18.6[A]	[15.7, 21.7]

https://rosap.ntl.bts.gov/view/dot/50940

NHTSA Publications

October 2020	October 2020	January 2021
Drug and Alcohol Prevalence in Seriously and Fatally Injured Road Users Before and During the COVID-19 Public Health Emergency	Examination of the Traffic Safety Environment During the Second Quarter of 2020 Special Report	Update to Special Reports on Traffic Safety During the COVID-19 Public Health Emergency: Third Quarter Data: Third Quarter Data
		
https://www.nhtsa.gov/behavioral-research https://rosap.ntl.bts.gov/view/dot/50941	https://www.nhtsa.gov/behavioral-research https://rosap.ntl.bts.gov/view/dot/50940	https://www.nhtsa.gov/behavioral-research https://rosap.ntl.bts.gov/view/dot/50940

NHTSA Publications

May 2021	June 2021	June 2021
Early Estimate of Motor Vehicle Traffic Fatalities in 2020	**Early Estimates of Motor Vehicle Traffic Fatalities and Fatality Rate by Sub-Categories in 2020**	**Update to Special Reports on Traffic Safety During the COVID-19 Public Health Emergency: Fourth Quarter Data, Research Note, Traffic Safety Facts**
		
https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813115	https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813118	https://www.nhtsa.gov/behavioral-research https://rosap.ntl.bts.gov/view/dot/56125

NIH Research on SARS-CoV-2 Positivity

- To keep our Drug Prevalence study going in Spring 2020, partnered with NIH and shared our (de-indentified) blood samples.
  - Tested our samples for SARS-CoV-2
  - April 2020-October 2020, n = 2,542
  - Overall, 7.9% positive
    - Miami 12%

Kaitlyn Sadtler, Ph.D.
Chief, Section for Immuno-Engineering,
National Institute of Biomedical Imaging and Bioengineering,
National Institutes of Health
https://pubmed.ncbi.nlm.nih.gov/34401892/

Reducing Electronic Device Use While Driving

Jordan Blenner, PhD, JD

Definition

NHTSA broadly defines driver distraction as anything that can take visual, manual, or cognitive resources away from the driving task.

Three Types of Distraction:

1. Visual – Eyes off the road
2. Manual – Hands off the wheel
3. Cognitive – Mind off the driving task

NHTSA Crash Data

- Nine percent of fatal crashes, 15 percent of injury crashes, and 15 percent of all police-reported motor vehicle traffic crashes in 2019 were reported as distraction-affected crashes.

- In 2019 there were 3,142 people killed and an estimated additional 424,000 people injured in motor vehicle crashes involving distracted drivers.

- Nine percent of drivers 15 to 20 years old involved in fatal crashes were reported as distracted. This age group has the largest proportion of drivers who were distracted at the time of the fatal crashes.

- In 2019 there were 566 nonoccupants (pedestrians, bicyclists, and others) killed in distraction affected crashes.

National Occupant Protection Use Survey (NOPUS)

- An estimated 432,995 passenger vehicle drivers, or 2.9 percent, were holding cell phones to their ears while driving at a typical daylight moment in 2019.

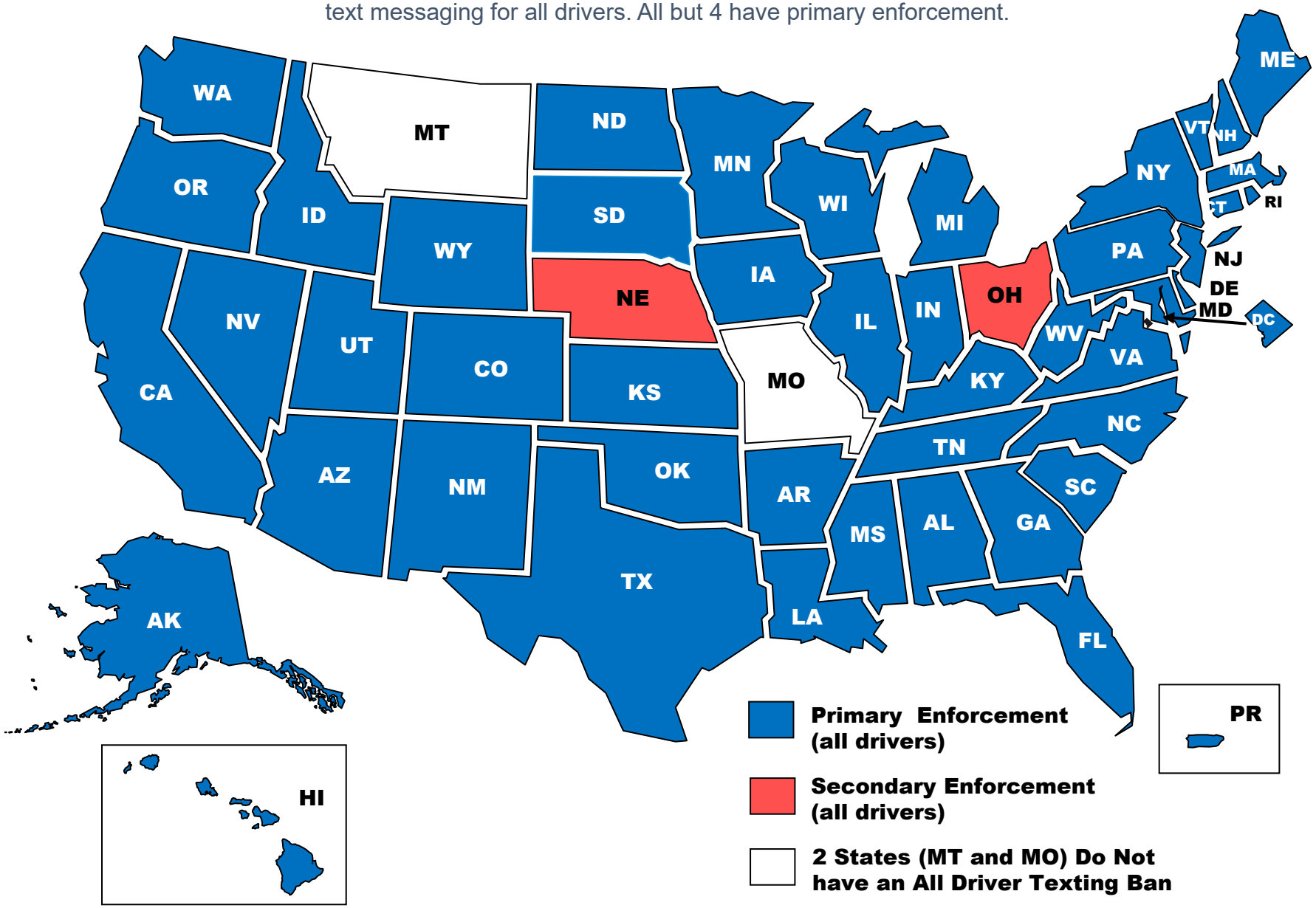
- The 2019 NOPUS found that handheld cell phone use continued to be higher among female drivers than male drivers, but the difference has been decreasing in recent years.

- Handheld cell phone use in 2019 was found to be highest among 16- to 24-year-old drivers, and lowest among drivers 70 and older.

Source: NHTSA/NOPUS

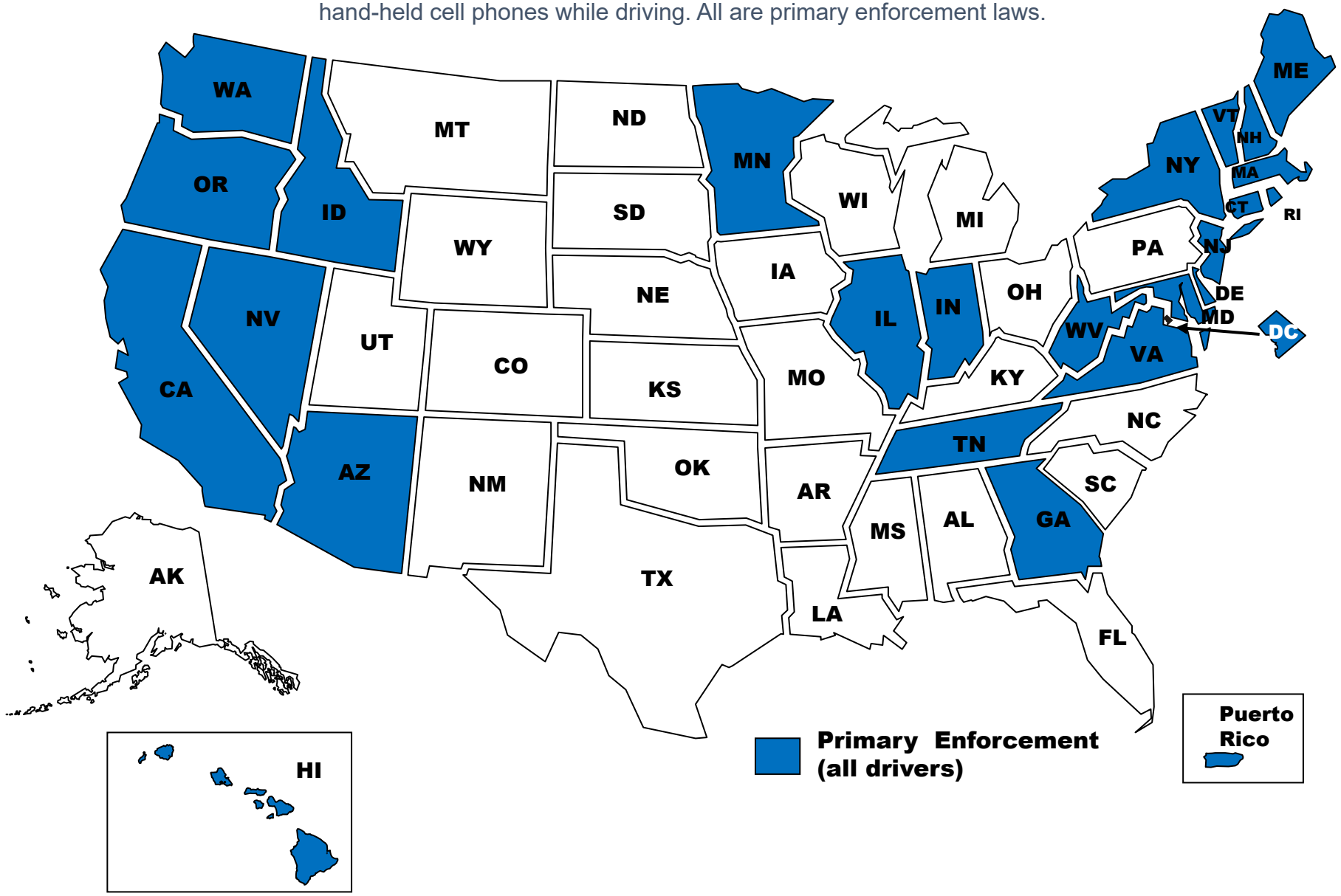
State Text Messaging Bans

48 states, D.C., Puerto Rico, Guam and the U.S. Virgin Islands ban text messaging for all drivers. All but 4 have primary enforcement.



State Hand-held Cell Phone Bans

24 states, D.C., Puerto Rico, Guam and the U.S. Virgin Islands prohibit all drivers from using hand-held cell phones while driving. All are primary enforcement laws.

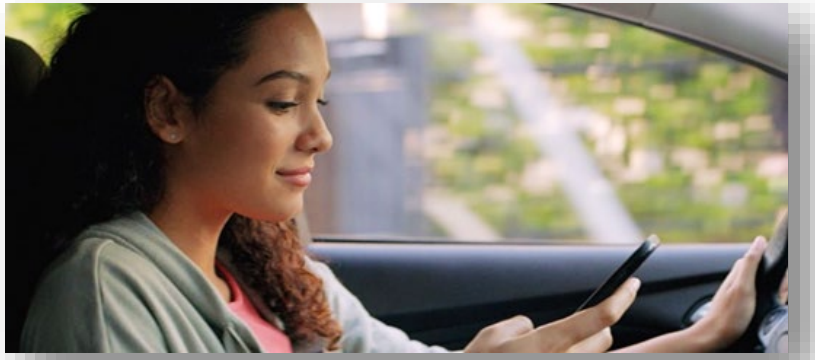


Distracted Driving Gained Momentum

- In 2009 the DOT Secretary hosted the first Distracted Driving Summit to bring focus to the issue and identify strategies and stakeholders
- The President issued an Executive Order in Oct 2009 prohibiting Federal employees from texting while driving government vehicles or while using government-supplied cell phones while driving any vehicle

NHTSA Distracted Driving Research

- NHTSA conducts research to support behavioral-based countermeasures such as legislation, enforcement, public awareness, and education
- While not the focus of this presentation, NHTSA also works to research technology, engineer solutions, and develop guidance to address distracted driving



Current Behavioral Safety Efforts

NHTSA…

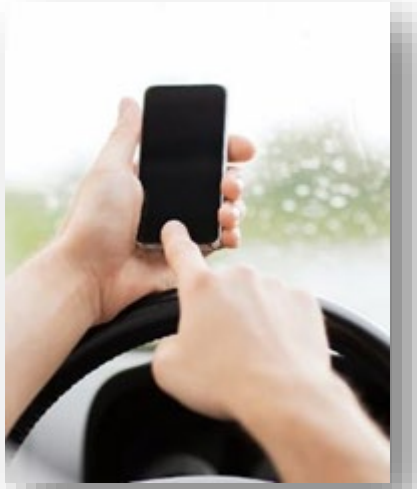
- Collects Data through our National Center of Statistics and Analysis
- Creates Communications Materials and campaigns through our Office of Communications and Consumer Information
- Conducts Research through our Office of Behavioral Safety Research and Office of Vehicle Safety Research
- Develops Programs through the Occupant Protection Division
- Provides Grant Funding to States though the Office of Regional Operations and Program Delivery

Distracted Driving Research: Recently Completed

- Taylor, N. L., & Blenner, J. A. (2021). **Attitudes and behaviors associated with young drivers' texting and app use.** *Transportation Research Part F, 78*, 326–339.
  - 2015 National Survey on Distracted Driving Attitudes & Behaviors
  - Population: 16-24-year-old drivers (626 respondents)
  - Reported engagement: *42%* reading a text/email, *33%* sending a text/email, and *23%* engaging in smartphone app use while driving
  - Strongest predictors: *Perceived safety* (all forms), *age-education* (reading), and *social norms* (sending)
  - Findings suggest:
    - Focusing on younger and older youth, including those in college
    - Understanding protective attitudes and behaviors

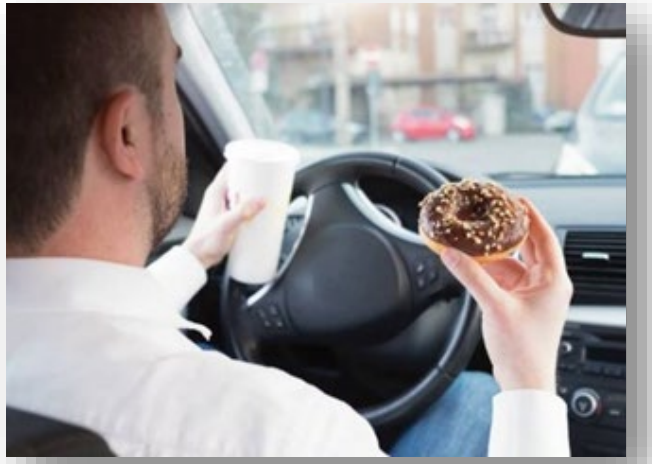
Distracted Driving Research: Recently Completed, cont.

- **Using Electronic Devices While Driving: Legislation and Enforcement Implications**
  - http://www.trb.org/Publications/Blurbs/181698.aspx
  - Literature review and scan of laws
  - Identified key components, developed classification scheme and point system, and assessed strength of laws
  - Quantitative and qualitative results
  - Includes materials that can be used by relevant stakeholders to support enactment of a law and educate key individuals on the importance of laws



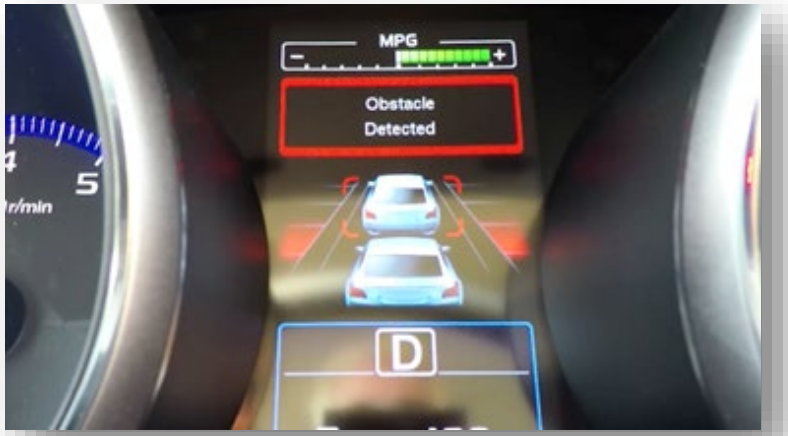
Distracted Driving Research: On-going

- **State of Knowledge on Distracted Driving**: a comprehensive literature review that covers multiple aspects of distracted driving behaviors with a focus on electronic device use
  - Anticipated publication: 2023
- **Influence of Infrastructure Design on Distracted Driving** (Transportation Research Board)
  - Anticipated completion: 2021



Distracted Driving Research: On-going, cont.

- **Advanced Driver Assistance Systems (ADAS) Technology and Distracted Driving**: to examine the effects of driver assistance technologies on distracted driving behaviors and driving performance
  - Pilot Study involving naturalistic driving observation
  - L2 systems: Adaptive Cruise Control and Lane Centering
  - Feasibility assessment for conducting hypothetical larger study



Traits, Attitudes, and Beliefs Related to Belt Use

Christine Watson, PhD

Background

In 2019, the national daytime observed seat belt use rate was 90.7%,[1] but 42.6% of passenger vehicle occupant fatalities were unrestrained.[2]

Demographic (e.g., age, sex) and situational (e.g., nighttime, rear seat) factors are associated with seat belt use.

Personality traits and other psychological constructs are associated with risky and protective health behaviors (e.g., smoking).

Primary Research Question:
Are traits, attitudes, and beliefs—like impulsivity, perception of risk, and optimism—associated with seat belt use?

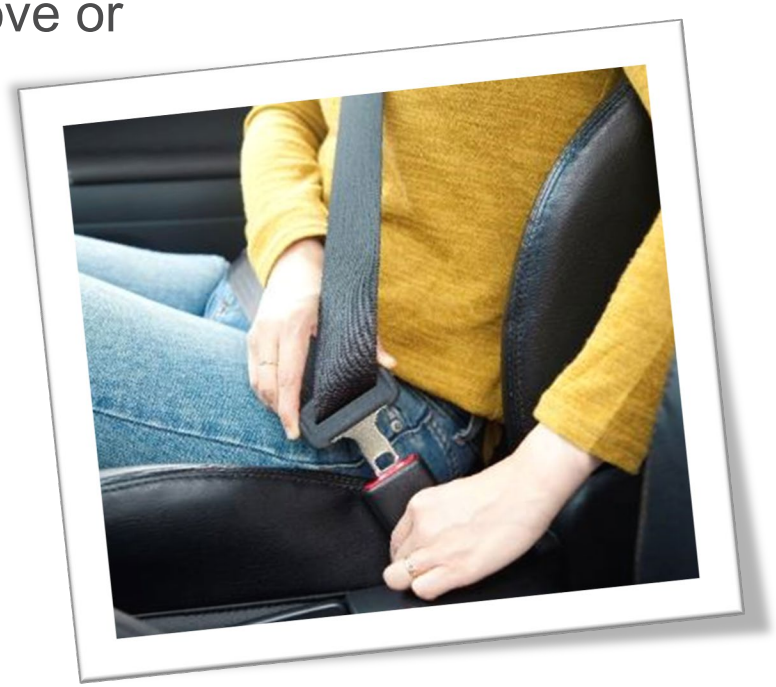
[1] https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812947 [2] https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813141

Methods: Survey and Sample

- **Psychological Constructs Related to Seat Belt Use Survey**
- Nationally-representative survey of U.S. residents (16+) who drove or rode in a car in past year
- Respondents recruited through Gfk's KnowledgePanel
- Administered between June and July 2018

- Included questions about:
  - Seat belt use in different situations
  - Psychological constructs of interest
  - Demographic characteristics

- Final sample: 5,833 adults (18+) and 205 teens (16-17)
- All statistical analyses incorporated complex sampling design



For more information about Methods, please see https://rosap.ntl.bts.gov/view/dot/54281/dot_54281_DS1.pdf

Methods: Measures of Seat Belt Use

Primary measure	Always vs. not-always Based on basic questions about belt use, like “how often do you wear your seat belt?”
Adjusted measure	Always vs. not-always Based on basic questions + questions about belt use in different situations (e.g., at night, in the rear seat)
Seat belt use score	Semi-continuous score Based on patterns of responses to all belt use questions, using multiple correspondence analysis

For more information about Methods, please see https://rosap.ntl.bts.gov/view/dot/54281/dot_54281_DS1.pdf

Methods: Traits, Attitudes, and Beliefs

- **Examined 18 traits, attitudes, and beliefs (psychological constructs)**
- Used validated scales selected from broad literature review of other risky and protective health behaviors

Anger	Optimism
Decision rule	Political orientation
Delay of gratification	Religiosity
Fatalism	Resistance to peer influence
Government intervention orientation	Risk aversion
Hostility	Risk perception
Impulsivity	Sensation-seeking
Life satisfaction	Social norms espousal
Loneliness	Social resistance orientation

For more information about Methods, please see https://rosap.ntl.bts.gov/view/dot/54281/dot_54281_DS1.pdf

Results

Self-reported seat belt use

- *Primary measure*: 76% reported full-time seat belt use
- *Adjusted measure*: 52% reported full-time seat belt use

Reasons for seat belt use

- Most frequent reasons for *wearing*: avoiding injury, seat belt use as a habit, compliance with the law
- Most frequent reasons for *not wearing*: driving a short distance, forgetting, seat belt discomfort

Associations between seat belt use and demographics

- Being *younger, male, not married,* and *other than non-Hispanic White* decreased likelihood of reporting full-time belt use
- Seat belt use differed across geographic regions of the U.S.

For more information about Results, please see https://rosap.ntl.bts.gov/view/dot/54280/dot_54280_DS1.pdf

Results

Primary Research Question:

Are traits, attitudes, and beliefs associated with seat belt use?

Regressions predicting likelihood of reporting full-time seat belt use

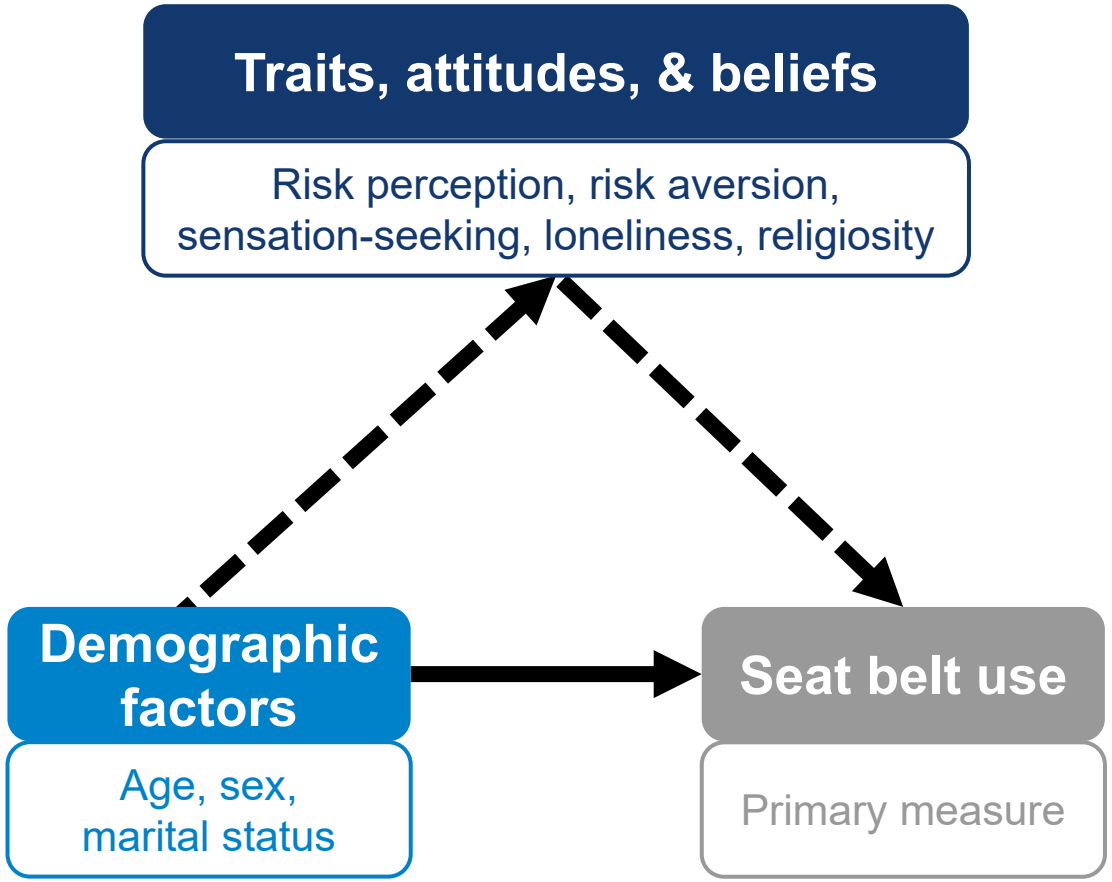
Psychological Construct	*Primary measure* Odds Ratio	*Adjusted measure* Odds Ratio	Seat Belt Use *Score* Coefficient
Delay of Gratification	*n.s.*	1.18	.10
Impulsivity	0.74	0.82	-.12
Life Satisfaction	1.14	*n.s.*	.05
Loneliness	1.22	*n.s.*	.04
Resistance to Peer Influence	*n.s.*	1.19	.07
Risk Aversion	1.66	1.68	.20
Risk Perception	2.32	1.85	.45
Social Resistance Orientation	0.78	0.86	-.11

N = 5,644. Odds ratios and coefficients only displayed for statistically significant effects ($p < .05$). Constructs displayed if effects significant ($p < .05$) in at least two models. *n.s.* = non-significant.

Increased likelihood of reporting full-time belt use

Decreased likelihood of reporting full-time belt use

Results



Mediation analyses

- Do traits, attitudes, and beliefs mediate relationships between demographics and seat belt use?
- Psychological constructs partly or wholly explained associations between demographics and *primary measure* of belt use

For more information about Results, please see https://rosap.ntl.bts.gov/view/dot/54280/dot_54280_DS1.pdf

Implications

Like other health behaviors (e.g., smoking), traits and other psychological constructs are associated with seat belt use

Results may be useful for identifying people at higher risk of seat belt non-use and developing countermeasures targeted at high-risk occupants

- E.g., people who perceived driving situations to be less risky were less likely to be full-time belt users
- Mediation analyses showed that reduced perception of risk explained part of the association between sex and seat belt use (i.e., males less likely to be full-time seat belt users)
- Education programs or messaging campaigns aimed at males may benefit from incorporating content designed to increase males' perception of the risk of seat belt non-use

Limitations

- Seat belt use was self-reported
- No measurement of family, community, State, or national-level influences on seat belt use

NHTSA

References:

Sheveland, A. C., Bleiberg, M. A., Mendelson, J., Luchman, J. N., Eby, D. W., Molnar, L. J., & Walton, B. R. (2020, December). *Psychological constructs related to seat belt use, volume 1: Methodology report* (Report No. DOT HS 813 032). National Highway Traffic Safety Administration. https://rosap.ntl.bts.gov/view/dot/54281/dot_54281_DS1.pdf

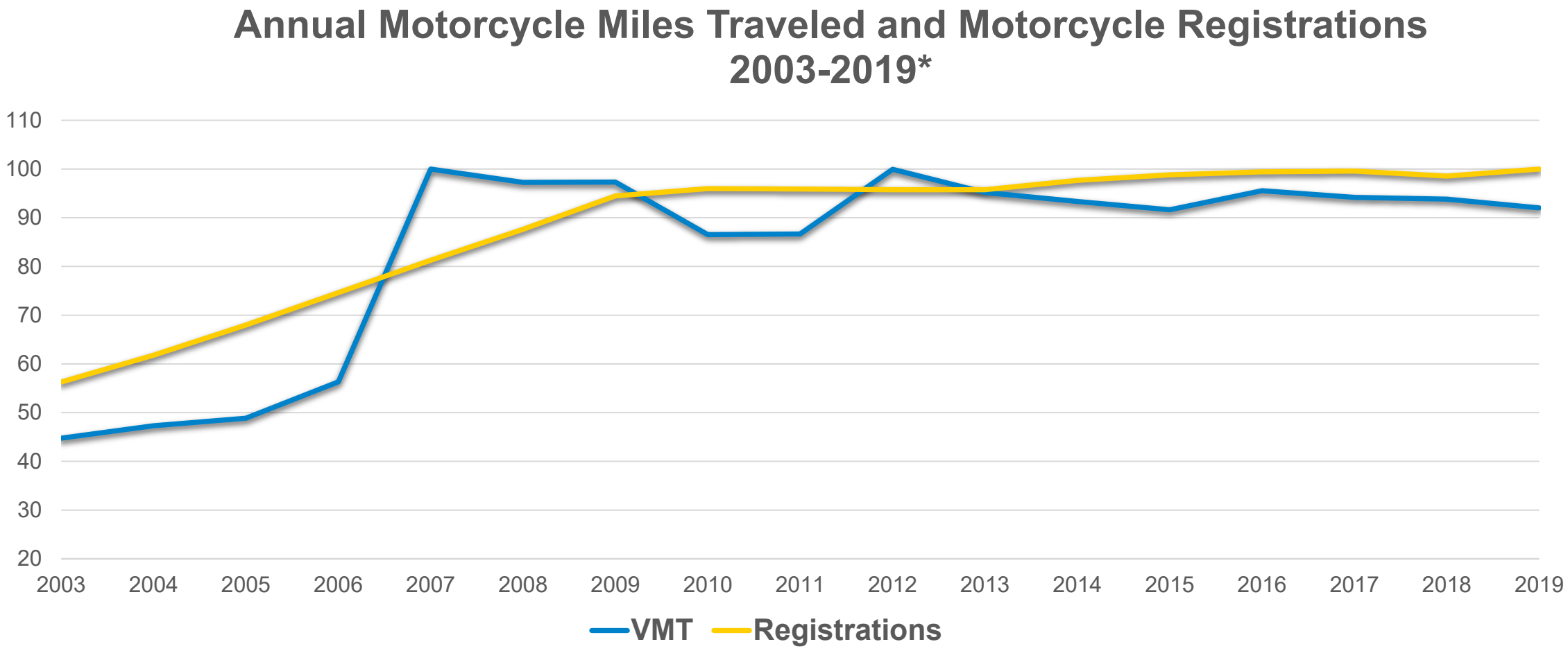
Sheveland, A. C., Luchman, J. N., Xie, J., Bleiberg, M. A., Eby, D. W., Molnar, L. J., & Walton, B. R. (2020, December). *Psychological constructs related to seat belt use, volume 2: Results report* (Report No. DOT HS 813 029). National Highway Traffic Safety Administration. https://rosap.ntl.bts.gov/view/dot/54280/dot_54280_DS1.pdf

Sheveland, A. C., Luchman, J. N., Mendelson, J., Xie, J., Bleiberg, M. A., Eby, D. W., Molnar, L. J., & Walton, B. R. (2020). Psychological constructs related to seat belt use: A nationally representative survey study. *Accident Analysis & Prevention, 148*, 105715. https://doi.org/10.1016/j.aap.2020.105715

Behavioral Approaches in Motorcyclist Safety

Kathryn Wochinger, PhD

Growth in Motorcycle Exposure



Sources:
Federal Highway Administration, Highway Statistics (Washington, DC: Annual Issues), Table VM-1.
IIHS (2021, March). Motorcycles registered in the United States, 2002–2021. Arlington, VA.
*Data is normalized.

Motorcycle Safety Problem

- Motorcyclists are disproportionately represented in traffic fatalities.
- Motorcyclist fatalities account for **14%** of all motor vehicle traffic fatalities;
- Motorcyclist fatalities occur nearly **27 times more** frequently than passenger car occupant fatalities

5,014

motorcyclists killed in 2019

Behavioral Research Approach

Data Sources

- FARS
- FHWA
- State Traffic Safety Data

Problem Identification

- Crash Characteristics
- Operator Characteristics

Methods

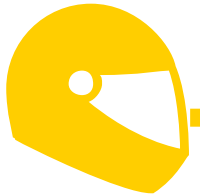
- Observation Surveys
- Self-Report Surveys
- Focus Groups
- Experiments
- Evaluations

Countermeasure Research

- Prevent destructive behaviors (e.g., Speeding, Impaired Riding)
- Encourage positive behaviors (e.g., use of helmets)

Behavioral Research Areas

Use of Protective Gear
Helmets - key to surviving a crash.



Impaired Riding
Impairment is a significant crash risk factor among motorcycle operators.

Training & Licensure
The safety impact of training is not clear (but is generally considered a good idea).

Speed
Speeding is a crash risk factor for motorcycles.

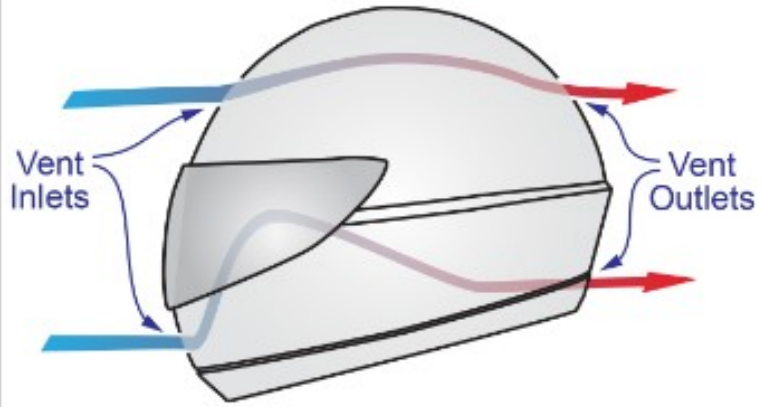
Motorist Awareness
A frequent type of crash is one which other drivers “looked but did not see” the motorcycle.

Data Needs
For example, exposure data is needed to establish crash risk.

Improving Thermal Comfort of Motorcycle Helmets

- GOAL - Increase the Comfort of Helmets
- Used a Small Business Innovation Research contract to explore innovative, inexpensive ways to improve comfort
- Company developed a prototype helmet to improve heat transfer

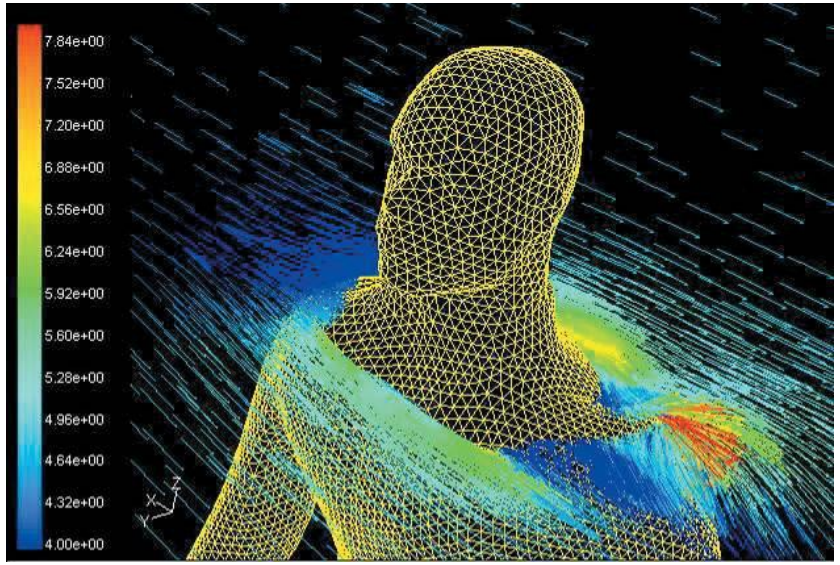
COTS Helmet

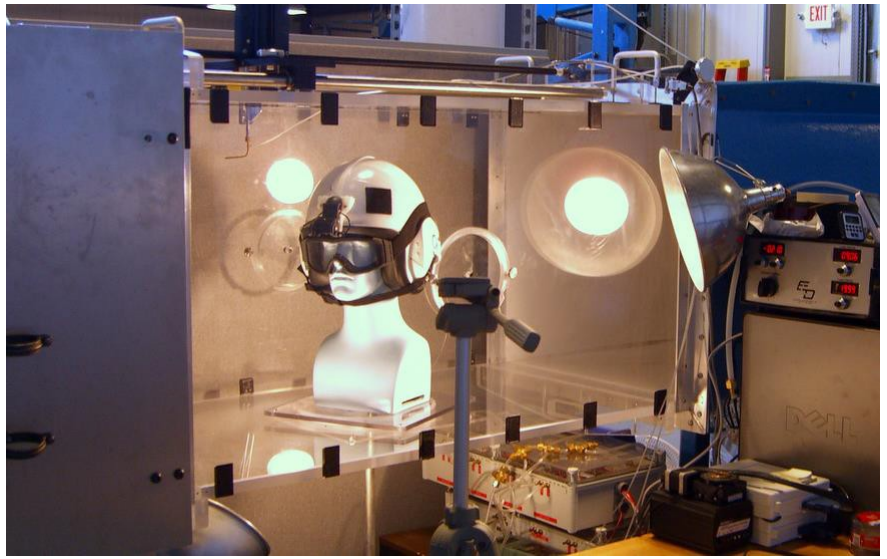


- Low helmet airflow
- Limited vent inlet area
- Restrictive flow path in helmet
- Inlet pressure less than maximum possible
- Does not meet penetration safety standards due to location of upper vents

Improving Thermal Comfort of Motorcycle Helmets…*continued*

- Modeled Fluid Dynamics Around Helmet and Head
- Used a wind tunnel to test cooling
- Company working with Bell Helmets to improve thermal comfort and noise attenuation

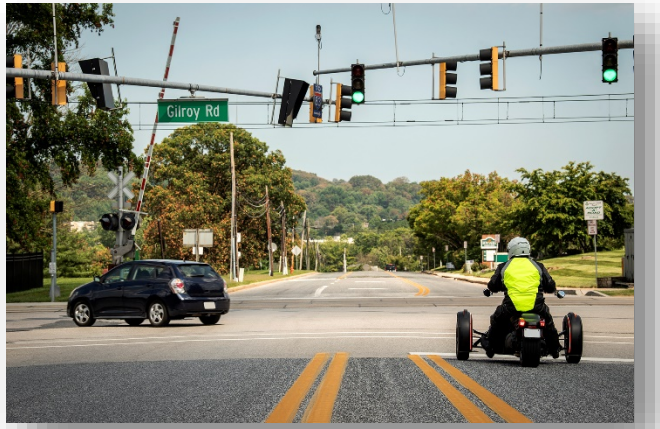




Motorcyclists' Attitudes toward Using High-Visibility Apparel to Improve Conspicuity

- Many motorcyclists do not use Hi-Viz gear
- Question is, "Would riders be willing to use high visibility apparel? Why do they not?"
- Examined rider attitudes and opinions about gear and conspicuity
- Identified issues relevant to efforts to increase use of conspicuous gear

Safety goal is to reduce conspicuity-related crashes.



Motorcyclists' Attitudes toward Using High-Visibility Apparel to Improve Conspicuity…*continued*

- Conducted 18 focus groups in four states (California, Maryland, Michigan, Texas)
- Grouped by motorcycle type and gender
- Most riders reported they:
  - do not use Hi-Viz
  - dislike its appearance
  - do not believe Hi-Viz would improve safety
  - said driver distraction is the primary safety problem and risk faced by motorcyclist


Forbes

Jul 18, 2019, 04:14pm EDT

Why Don't Motorcyclists Wear Gear That Can Save Their Lives?

Tanya Mohn Contributor

Travel

I cover road safety and consumer travel.

Methodology for the Observational Survey of Motorcycle Personal Protective Equipment (PPE)

- Few States collect data on gear use – difficult and expensive
- Lack of data makes it difficult to assess safety programs
- Need reliable, accurate measures of the use of PPE (helmets, jackets, hi-viz) to understand impact of safety programs
- Goal is to identify promising approaches for States to use

Methodology for the Observational Survey of Motorcycle PPE - continued

- Pilot tested in Florida, found that:
  - Oversampling road segments with higher motorcycle traffic is necessary
  - Observing helmet use is possible using the moving traffic protocol
  - Observing other types of PPE requires more time – can be achieved at intersections

Pilot Test of Observational Survey Follow-Up

- Conduct a follow-up observational survey in Florida and Texas
- Compare findings and produce a tool kit

Actual NHTSA Employees

Driver Attitudes toward Motorcycling

- Addresses motorist awareness of motorcycles
- Familiarity with motorcycles may influence safe behaviors towards motorcycles
- Developed a questionnaire to assess driver attitudes, knowledge, and beliefs about motorcycles and motorcyclists
- Survey of adult drivers in Florida and Pennsylvania
  - Large states with sizable numbers of motorcycle riders
  - Neither has a universal helmet use law

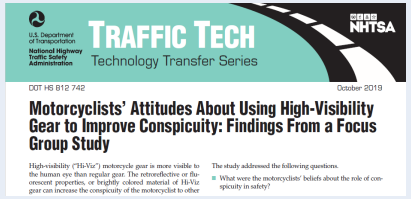
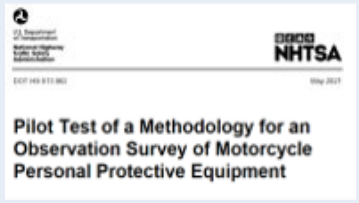
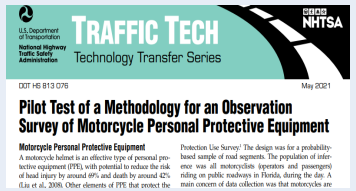
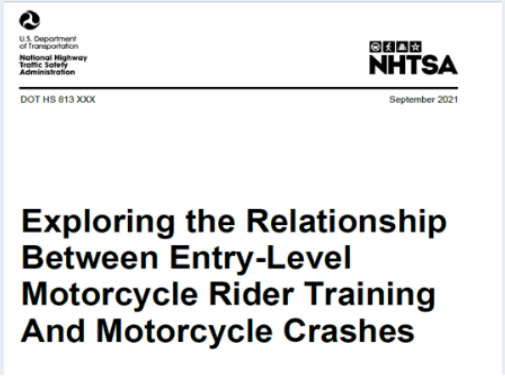
Scooter and E-Bikes – Safety Needs

- Newly awarded contract to examine the safety status of scooters and E-bikes
- Obtain information on use and safety
- Examine issues of equity in terms of access and safety
- Identify data sources and data needs

Scooter and E-Bikes – BTSCRP

- Behavioral Traffic Safety Cooperative Research Program (BTSCRP) is a partnership between NHTSA, the Governors Highway Safety Association, and the Transportation Research Board
- BTS-19, Moped and Motor Scooter (50 cc or less) Safety: Issues and Countermeasures
  - Provide operator safety recommendations based on identified risk factors and develop model licensing and training requirements for moped and seated motor scooter riders that limit risk factors.
  - Currently pending
- BTS-10, E-Scooter Safety: Issues and Solutions
  - Develop comprehensive evidence-based guidance to help affected agencies plan for and mitigate related safety problems.
  - Underway, expected completion 2022

NHTSA Publications

May/October 2019	May 2021	Late 2021
Motorcyclists' Attitudes About Using High-Visibility Gear to Improve Conspicuity: Findings From a Focus Group Study - Final Report & Traffic Tech	**Pilot Test of a Methodology for an Observation Survey of Motorcycle Personal Protective Equipment - Final Report & Traffic Tech**	**Exploring the Relationship between Entry-Level Motorcycle Rider Training and Motorcycle Crashes - Final Report**
 	 	
https://www.ghsa.org/sites/default/files/2019-06/NCREP_MotorcyclistAttitudes19.pdf https://rosap.ntl.bts.gov/view/dot/53595	https://rosap.ntl.bts.gov/view/dot/55732 https://rosap.ntl.bts.gov/view/dot/55731	Available late 2021

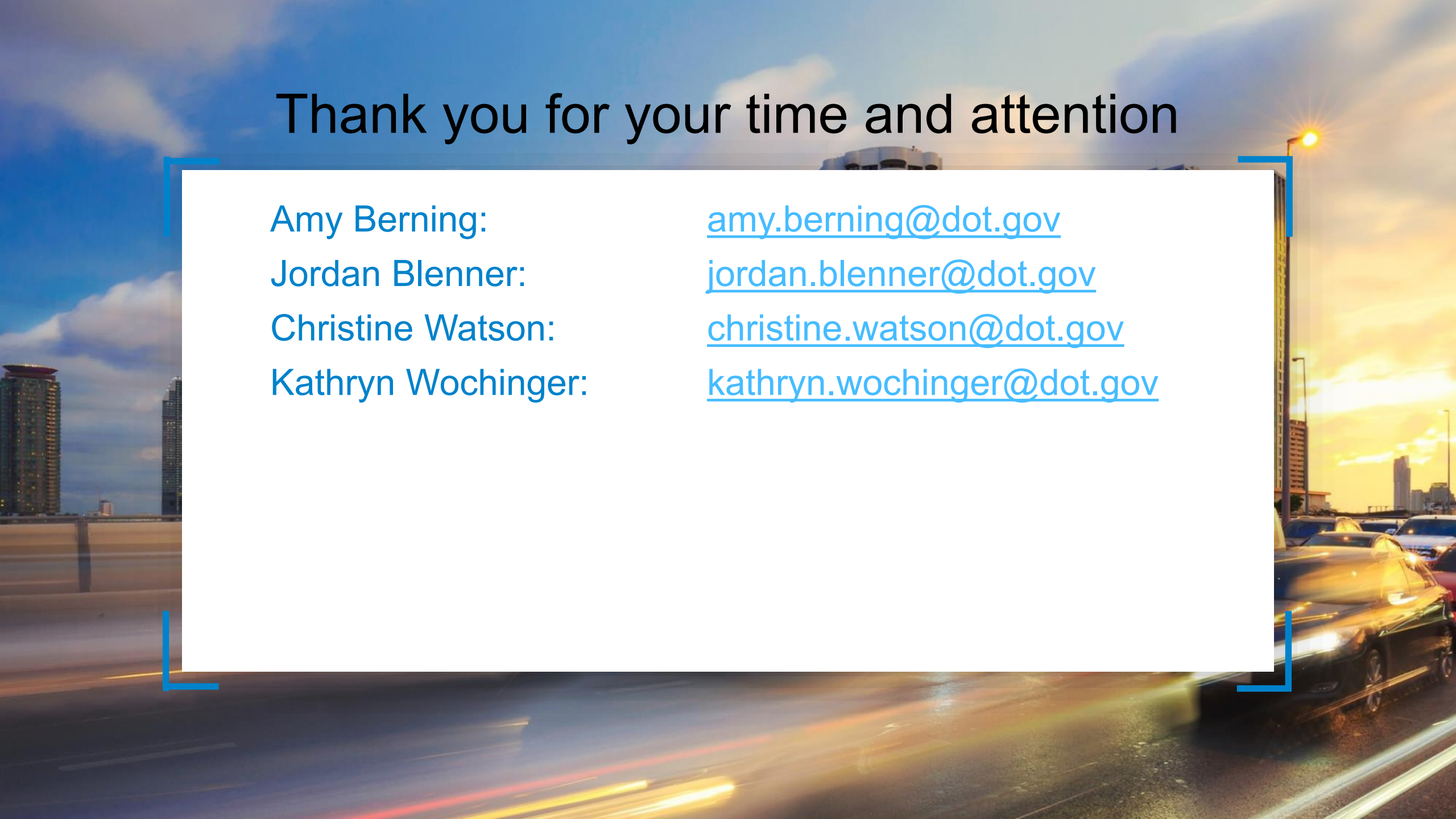
NHTSA Motorcycle Safety Information

Crash Statistics and Data Reports:
https://crashstats.nhtsa.dot.gov/

FARS Data Visualization for Motorcycles:
https://cdan.dot.gov/DataVisualization/DataVisualization.htm#

Safety Marketing Materials:
http://www.trafficsafetymarketing.gov/get-materials/motorcycle-safety

“Cross the Line” Video Spot on Impaired Riding:
https://youtu.be/qaJoUukz1ow



Thank you for your time and attention

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