



CCMTA | CCATM

Canadian Council of Motor Transport Administrators
Conseil canadien des administrateurs en transport motorisé

BIENVENUE ASSEMBLÉE ANNUELLE 2018 DU CCATM

WELCOME TO THE 2018 CCMTA ANNUAL MEETING

QUÉBEC

Distracted Driving and Risk of Road Crashes Across Drivers of Different Age Groups

Charlie Klauer
Feng Guo
Tom Dingus
Jon Hankey

CCMTA 2018

Quebec City, Quebec

Background and Research Needs

- Naturalistic driving studies have shown
 - Manual-visual tasks increase CNC risk by 2 to 3 times that of alert driver
- Other epidemiological studies have shown that risk increases ~4 times due cell phone use compared to alert driver.
- Most of this research has only investigated adult/experienced drivers
- Need: Prevalence and Risk for:
 - Drivers of varying age groups
 - Risk using **crash data only**



* CNC- Crash/near crashes

What Is a Naturalistic Driving Study?

- No experimenter present
- Participants drive as they normally would
- Collected (preferably) in privately owned vehicles
- Unobtrusive instrumentation
- Provide:
 - Detailed pre-crash information
 - Real-life behaviors
 - Rich databases for subsequent mining



Data Acquisition Systems (DASs)

- Highly configurable
- Quickly installed within any vehicle
- Large capacity data collection
- Provides a wide array of I/O options
- Distributed sensors network, including NTSC cameras for flexibility



*NextGen
DAS*



SHRP 2...at a Glance

- The Second Strategic Highway Research Program Naturalistic Driving Study (SHRP 2 NDS)
- Largest naturalistic driving study ever undertaken
 - 3,542 drivers, diverse age/gender groups
 - 4,368 data years; 5,512,900 trip files
 - Up to 2 years of data collection per participant
 - Light vehicles & SUVs
- Six data collection sites
- Data useful for next generation of researchers
 - > 1,600 crashes
 - > 2,900 near-crashes (“it would have been a crash, but...”)
 - 32,475,671 miles of driving
 - **~2 petabytes of data (1 PB = 1,024 TB = 1,048,576 GB)**
- Huge logistical challenge...



Please no Recording/Picture taking of the following slides.

Thank you!

Video Coding and Analysis

- High g-force and/or short TTC events ID'd crashes
 - Coded 5 sec before/ 1sec after each crash onset
- Random sample of non-crash road segments
 - Stratified sampling by Vehicle Miles Travelled
- Quality Control and Assurance
 - Training, protocols, spot-checking and inter-rater testing
- **Analysis-** Mixed effects logistic regression
 - Random intercept (account for within-driver correlations)

SHRP2 Prevalence Results

	Age 16-20	Age 21-29	Age 30-64	Age 65-98
Overall distraction	58%	57%	52%	40%
Overall cell use	9%	11%	5%	0.9%
Cell talking	3%	6%	3%	0.7%
Cell visual-manual tasks	5%	6%	2%	0.2%
Talking/singing	12%	10%	6%	4%
Interact with passenger	18%	15%	15%	15%
Drinking	1%	1%	2%	0.8%
Eating	2%	2%	3%	1%
Look outside of vehicle	0.7%	0.8%	1%	1%
Reaching for in-vehicle objects(not cellphone)	0.9%	1%	1%	1%
Operate in-vehicle device	4%	4%	3%	3%

SHPR2 Crash Risk Calculations by Age

Secondary Task	ORs by Age Group			
	Age 16-20	Age 21-29	Age 30-64	Age 65-98
Overall distraction	2.1	2.7	1.5	1.7
Overall cell use	3.4	4.0	2.2	5.3
Cell talking	2.2	2.8	1.5	2.3
Cell visual-manual tasks	4.2	5.9	3.2	19.0
Talking/singing	1.4	2.1	1.4	0.9
Interact with passenger	1.5	1.6	1.0	1.0
Drinking	1.6	3.1	1.6	1.0
Eating	2.0	3.6	0.3	2.8
Look outside of vehicle	10.6	8.0	5.7	5.6
Reaching for in-vehicle objects(not cellphone)	7.9	12.4	10.8	6.6
Operate in-vehicle device	2.2	3.5	1.7	2.0

New Directions...

- Types of secondary tasks over time
- Willingness to engage..
- Impact of roadway environment/context
- New naturalistic driving studies
 - Canada NDS is available
 - <https://insight.canada-nds.net/login/auth>
- Educational solutions
 - Any task that takes your eyes off the road
 - Parents are critical to younger, novice drivers
- Technological solutions
 - Voice command technologies
 - Driver monitoring systems – automated vehicle systems

Conclusions

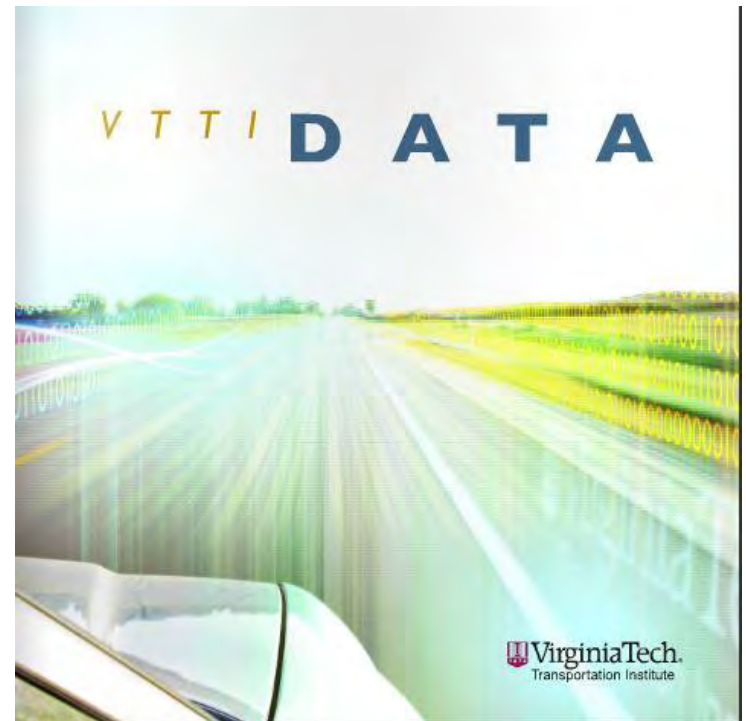
- Many types of secondary tasks increase crash risk for drivers of all ages—not just wireless devices.
- Risk of crash occurrence for novice drivers is highest for those tasks that require their eyes off the road.
 - Talking on cell phone increases risk for younger drivers.
- Supports hand-held device bans for drivers of all ages.
- Supports texting bans for drivers of all ages.
- Supports the development of voice command//hands free technologies

Sponsors

- Transportation Research Board – National Academies of Science

QUESTIONS??

Charlie Klauer, VTTI
cklauer@vtti.vt.edu



CCMTA | CCATM

Canadian Council of Motor Transport Administrators
Conseil canadien des administrateurs en transport motorisé

