



U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

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people saving people

DOT HS 810 593

April 2006

The 100-Car Naturalistic Driving Study

Phase II – Results of the 100-Car Field Experiment

Appendix A: Driver Enrollment Forms

Visual Acuity Test

Snellen Eye Chart:

Right Eye: _____

Left Eye: _____

Ishihara's Test for Color Deficiency:

Plate 1: _____

Plate 8: _____

Plate 2: _____

Plate 9: _____

Plate 3: _____

Plate 10: _____

Plate 4: _____

Plate 11: _____

Plate 5: _____

Plate 12: _____

Plate 6: _____

Plate 13: _____

Plate 7: _____

Plate 14: _____

Comments: _____

Contrast Sensitivity Test:

Left Eye:

Right Eye:

Row A: _____

Row A: _____

Row B: _____

Row B: _____

Row C: _____

Row C: _____

Row D: _____

Row D: _____

Row E: _____

Row E: _____

Comments: _____

Audiogram Air Conduction Test

Check all that apply

Known hearing loss Right Left

Uses hearing aids Right Left

History of ear problems Right Left

Ear surgery Right Left

Tinnitus (ringing) Right Left

Fullness feeling in the ears Right Left

Ear wax buildup Right Left

Ear pain Right Left

Ear drainage problems Right Left

Diabetes Right Left

Kidney problems Right Left

Noise exposure

work military hobby other

Vertigo/dizziness

Head injury/loss of consciousness

High blood pressure

Family history of hearing loss

Family members with hearing loss

Comments:

Hearing Test

Audiometer: Welch Allyn AM 232 Manual Audiometer

Last acoustical calibrations: _____

Tester: _____

Date of Testing: _____

BASELINE HEARING TEST

LEFT EAR

125	250	500	750	1000	1500	2000	3000	4000	6000	8000

Comments: _____

RIGHT EAR

125	250	500	750	1000	1500	2000	3000	4000	6000	8000

Comments: _____

Medical Health Assessment

To the Participant: Please note that your responses to the following questions will in no way affect your ability to participate in the study. Your honest answers are appreciated

1. Do you have a history of any of the following?
 - a. Stroke Y N
 - b. Brain tumor Y N
 - c. Head injury Y N
 - d. Epileptic seizures Y N
 - e. Respiratory disorders Y N
 - f. Motion sickness Y N
 - g. Inner ear problems Y N
 - h. Dizziness, vertigo, or other balance problems Y N
 - i. Diabetes Y N
 - j. Migraine, tension headaches Y N
 - k. Depression Y N
 - l. Anxiety Y N
 - m. Other psychiatric disorders Y N
 - n. Arthritis Y N
 - o. Auto-immune disorders Y N
 - p. High blood pressure Y N
 - q. Heart arrhythmias Y N
 - r. Chronic fatigue syndrome Y N
 - s. Chronic stress Y N

If yes to any of the above, please explain?

2. Are you currently taking any medications on a regular basis? Y N
If yes, please list them.

3. (Females only) Are you currently pregnant? Y N

4. Height _____

5. Weight _____ lbs.

Walter Reed Army Institute of Research Preliminary Sleep Questionnaire

Using the following rating scale, to what extent do you currently experience the following?

	None	Moderate						Severe		
Daytime sleepiness	1	2	3	4	5	6	7	8	9	10
Snoring	1	2	3	4	5	6	7	8	9	10
Difficulty falling asleep	1	2	3	4	5	6	7	8	9	10
Difficulty staying asleep	1	2	3	4	5	6	7	8	9	10
Difficulty waking up	1	2	3	4	5	6	7	8	9	10
Daytime sleepiness	1	2	3	4	5	6	7	8	9	10
Obtain too little sleep	1	2	3	4	5	6	7	8	9	10

Read through the following questions carefully, answer each as accurately as possible

1. When you are working:
what time do you go to bed ____:____ a.m./p.m. and wake up ____:____ a.m./p.m.
2. When you are not working:
what time do you go to bed ____:____ a.m./p.m. and wake up ____:____ a.m./p.m.
3. Do you keep a fairly regular sleep schedule? Yes_____ No_____
4. How many hours of actual sleep do you usually get? _____
5. Do you consider yourself a light, normal, or heavy sleeper? _____
6. Do you feel uncomfortably sleepy during the day? Never_____ every day_____ more than once per week_____ once per week_____ a few times a month_____ once a month or less_____
7. Do you ever have an irresistible urge to sleep or find that you fall asleep in unusual/inappropriate situations? Never_____ every day_____ more than once per week_____ once per week_____ a few times a month_____ once a month or less_____
8. Do you usually nap during the day (or between major sleep periods)?
Yes_____ No_____
9. Do you drink caffeinated beverages (coffee, tea, Coca Cola, Mountain Dew, Jolt Cola)?
Yes_____ No_____
10. If yes, how many cups/glasses per day? _____

Dula Dangerous Driving Index

Please answer each of the following items as honestly as possible. Please read each item carefully and then circle the answer you choose on the form. If none of the choices seem to be your ideal answer, then select the answer that comes closest. THERE ARE NO RIGHT OR WRONG ANSWERS. Select your answers quickly and do not spend too much time analyzing your answers. If you change an answer, erase the first one well.

1. I drive when I am angry or upset.
A. Never B. Rarely C. Sometimes D. Often E. Always
2. I lose my temper when driving.
A. Never B. Rarely C. Sometimes D. Often E. Always
3. I consider the actions of other drivers to be inappropriate or “stupid.”
A. Never B. Rarely C. Sometimes D. Often E. Always
4. I flash my headlights when I am annoyed by another driver.
A. Never B. Rarely C. Sometimes D. Often E. Always
5. I make rude gestures (e.g., giving “the finger”; yelling curse words) toward drivers who annoy me.
A. Never B. Rarely C. Sometimes D. Often E. Always
6. I verbally insult drivers who annoy me.
A. Never B. Rarely C. Sometimes D. Often E. Always
7. I deliberately use my car/truck to block drivers who tailgate me.
A. Never B. Rarely C. Sometimes D. Often E. Always
8. I would tailgate a driver who annoys me.
A. Never B. Rarely C. Sometimes D. Often E. Always
9. I “drag race” other drivers at stop lights to get out front.
A. Never B. Rarely C. Sometimes D. Often E. Always
10. I will illegally pass a car/truck that is going too slowly.
A. Never B. Rarely C. Sometimes D. Often E. Always
11. I feel it is my right to strike back in some way, if I feel another driver has been aggressive toward me.
A. Never B. Rarely C. Sometimes D. Often E. Always
12. When I get stuck in a traffic jam I get very irritated.
A. Never B. Rarely C. Sometimes D. Often E. Always
13. I will race a slow moving train to a railroad crossing.
A. Never B. Rarely C. Sometimes D. Often E. Always
14. I will weave in and out of slower traffic.
A. Never B. Rarely C. Sometimes D. Often E. Always

15. I will drive if I am only mildly intoxicated or buzzed.
A. Never B. Rarely C. Sometimes D. Often E. Always
16. When someone cuts me off, I feel I should punish him/her.
A. Never B. Rarely C. Sometimes D. Often E. Always
17. I get impatient and/or upset when I fall behind schedule when I am driving.
A. Never B. Rarely C. Sometimes D. Often E. Always
18. Passengers in my car/truck tell me to calm down.
A. Never B. Rarely C. Sometimes D. Often E. Always
19. I get irritated when a car/truck in front of me slows down for no reason.
A. Never B. Rarely C. Sometimes D. Often E. Always
20. I will cross double yellow lines to see if I can pass a slow moving car/truck.
A. Never B. Rarely C. Sometimes D. Often E. Always
21. I feel it is my right to get where I need to go as quickly as possible.
A. Never B. Rarely C. Sometimes D. Often E. Always
22. I feel that passive drivers should learn how to drive or stay home.
A. Never B. Rarely C. Sometimes D. Often E. Always
23. I will drive in the shoulder lane or median to get around a traffic jam.
A. Never B. Rarely C. Sometimes D. Often E. Always
24. When passing a car/truck on a 2-lane road, I will barely miss on-coming cars.
A. Never B. Rarely C. Sometimes D. Often E. Always
25. I will drive when I am drunk.
A. Never B. Rarely C. Sometimes D. Often E. Always
26. I feel that I may lose my temper if I have to confront another driver.
A. Never B. Rarely C. Sometimes D. Often E. Always
27. I consider myself to be a risk-taker.
A. Never B. Rarely C. Sometimes D. Often E. Always
28. I feel that most traffic “laws” could be considered as suggestions.
A. Never B. Rarely C. Sometimes D. Often E. Always

34. Does it annoy you to drive behind a slow moving vehicle?

1 2 3 4 5 6 7 8 9 10
Very much Not at all

35. When you're in a hurry, other drivers usually get in your way.

1 2 3 4 5 6 7 8 9 10
Not at all Very much

36. When I come to negotiate a difficult stretch of road, I am on the alert.

1 2 3 4 5 6 7 8 9 10
Very much Not at all

37. Do you feel more anxious than usual when driving in heavy traffic?

1 2 3 4 5 6 7 8 9 10
Not at all Very much

38. I enjoy cornering at high speeds.

1 2 3 4 5 6 7 8 9 10
Not at all Very much

39. Are you annoyed when the traffic lights change to red when you approach them?

1 2 3 4 5 6 7 8 9 10
Very much Not at all

40. Does driving, usually make you feel aggressive?

1 2 3 4 5 6 7 8 9 10
Very much Not at all

41. Think about how you feel when you have to drive for several hours, with few or no breaks from driving.
How do your feelings change during the course of the drive?

a) More uncomfortable physically (e.g. headache or muscle pains) 1 2 3 4 5 6 7 8 9 10 No change

b) More drowsy or sleepy 1 2 3 4 5 6 7 8 9 10 No change

c) Maintain speed of reaction 1 2 3 4 5 6 7 8 9 10 Reactions to other traffic becomes increasingly slower

d) Maintain attention to road signs 1 2 3 4 5 6 7 8 9 10 Become increasingly inattentive to road signs

e) Normal vision 1 2 3 4 5 6 7 8 9 10 Vision becomes less clear

f) Increasingly difficult to judge your speed 1 2 3 4 5 6 7 8 9 10 Normal judgment of speed

g) Interest in driving does not change 1 2 3 4 5 6 7 8 9 10 Increasingly bored and fed up

h) Passing becomes increasingly risky and dangerous 1 2 3 4 5 6 7 8 9 10 No change

Life Stress Inventory

Please read through the following events carefully. Mark each event which occurred within the past year.

- | | |
|---|---|
| <input type="checkbox"/> Death of spouse or parent | <input type="checkbox"/> Son or daughter leaves |
| <input type="checkbox"/> Divorce | <input type="checkbox"/> Trouble with in-laws/partner's family |
| <input type="checkbox"/> Marital separation or separation from living partner | <input type="checkbox"/> Outstanding personal achievement |
| <input type="checkbox"/> Jail term | <input type="checkbox"/> Mate begins or stops work |
| <input type="checkbox"/> Death of close family member | <input type="checkbox"/> Change in living conditions |
| <input type="checkbox"/> Personal injury or illness | <input type="checkbox"/> Marriage/establishing life partner |
| <input type="checkbox"/> Fired from job | <input type="checkbox"/> Change in personal habit |
| <input type="checkbox"/> Marital or relationship reconciliation | <input type="checkbox"/> Trouble with boss |
| <input type="checkbox"/> Retirement | <input type="checkbox"/> Change in work hours or conditions |
| <input type="checkbox"/> Change in health of family member | <input type="checkbox"/> Change in residence |
| <input type="checkbox"/> Pregnancy | <input type="checkbox"/> Change in schools |
| <input type="checkbox"/> Sex difficulties | <input type="checkbox"/> Change in church activities |
| <input type="checkbox"/> Gain of new family member | <input type="checkbox"/> Change in recreation |
| <input type="checkbox"/> Business readjustment | <input type="checkbox"/> Change in social activities |
| <input type="checkbox"/> Change in financial state | <input type="checkbox"/> Minor loan (car, TV, etc) |
| <input type="checkbox"/> Death of close friend | <input type="checkbox"/> Change in sleeping habits |
| <input type="checkbox"/> Change to different line of work or study | <input type="checkbox"/> Change in number of family get-togethers |
| <input type="checkbox"/> Change in number of arguments with spouse or partner | <input type="checkbox"/> Change in eating habits |
| <input type="checkbox"/> Mortgage or loan for major purchase (home, etc.) | <input type="checkbox"/> Vacation |
| <input type="checkbox"/> Foreclosure of mortgage or loan | <input type="checkbox"/> Christmas (if approaching) |
| <input type="checkbox"/> Change in responsibilities at work | <input type="checkbox"/> Minor violation of the law |

[Part 8 of this appendix is a PDF, which goes here]

WayPoint Test

Test Name: WayPoint

Objective: Used to identify drivers who are at high risk of being in a crash.

Description/Procedure: Measures the speed of information processing and a person's vigilance. The test is done by computer and consists of 4 different levels of sequential "connect-the-dots" type activities. The subject is required to start at 1 then find A, then 2, then B, and so on. The different levels get consecutively harder, in the last level distracters are add to test the subject's response to a novel situation. The subjects risk level is measured by using their reaction times from the 4 activities to gauge his/her channel capacity and situational awareness level.

Rationale: WayPoint has been administered and used in several validation trials to measure its accuracy rate for over-the-road trucks, transit buses, Army enlisted personnel automobile drivers, and teenage drivers. In a study sponsored by NHTSA, WayPoint's predictive value was tested on elderly drivers. The report states that WayPoint's hit rate (identifying high-risk drivers) is 62.2% and its false-alarm rate (mistakenly identifying low risk drivers as high risk) is 19.9%

Comments: Based on its validity and hit rate, this could be a useful tool during the subject screening or in-processing process.

Useful-Field-of-View Test

Test Name: Useful Field of View (UFOV)

Objective: Used to measure a driver's risk for accident involvement

Description/Procedure: The UFOV is a computer based test that measures central vision and processing speed, divided attention, and selective attention. The participant is required to select rapidly presented target objects that are flesh on the computer screen while simultaneously attending to other stimuli. The program then prints out a report that assigns a crash risk level for the participant.

Rationale: UFOV has been used in many studies of older drivers and has been shown to be a good measure of visual processing and attention. As reported by the NIH, a driver's risk rises 16 percent for every 10 points of visual reduction in the driver's useful field of view for drivers 55 and older.

Comments: Most studies using this measure are conducted on those 55 and older, however, this test may be a useful tool to help predict and classify which participants have a higher risk of accident, near-crash, and critical incident involvement. Although this test is usually used on the elderly it is also used on those that have concerns about their driving due to multiple accident involvement, head trauma, and memory disorders.

Debriefing Questionnaire

Driver # _____

Please answer the following questions as accurately as possible. You may need to take some time to think about each question for a few minutes. Remember, all responses are completely confidential.

1a. Over the past year, how often were you very or extremely fatigued while driving?

- Never (if the answer is never, skip to question 2)
- Once or twice over the year
- 3 or 4 times over the year
- Monthly
- Once per week
- More than once per week
- Almost daily or daily

1b. When you drive very or extremely fatigued, is the fatigue due to (select all that apply):

- Too little sleep the night before
 - A chronic problem of too little sleep
 - Driving after a long day (so that it is late at night)
 - Stress at home or work
 - Illness
 - Drugs/alcohol/partying
 - Other (explain)
-

1c. When you drive very or extremely fatigued, how often do you have you fallen asleep at the wheel?

- Once or twice over the year
- 3 or 4 times over the year
- Monthly
- Once per week
- More than once per week
- Almost daily or daily

1d. During times you have driven very or extremely fatigued, in **all of your experience** driving, how many times have you had a crash or hit something with your car?

- 0
- 1
- 2
- 3
- 4

1e. How many times have you driven very or extremely fatigued **during this study** and had a crash or hit something with your car?

- 0
- 1
- 2
- 3
- 4

1f. During times you have driven very or extremely fatigued, in **all of your experience** driving, how many times have you had a **near-crash or close call**? For example, running off the road or drifting into an oncoming lane.

- 0
- 1
- 2
- 3
- 4

1g. How many times have you driven very or extremely fatigued **during this study** and had a **near-crash or close call**?

- 0
- 1
- 2
- 3
- 4
- more

1h. How dangerous or risky would you say it is to drive while very or extremely fatigued?

Not risky		Slightly risky		Moderately risky		Very risky		Extremely risky

2a. Over the past year, how often were you under the influence of drugs or alcohol while driving?

- Never (if the answer is never, skip to question 3)
- Once or twice over the year
- 3 or 4 times over the year
- Monthly
- Once per week
- More than once per week
- Almost daily or daily

2b. When you drive under the influence of drugs or alcohol, is this due to (select all that apply):

- You believed that you were still a safe driver
 - You were too intoxicated to know better
 - You did not care
 - You did not have a designated driver and needed to be someplace
 - Other (explain)
-

2c. During times you have driven under the influence, **in all of your experience driving**, how many times have you had a **crash** or hit something with your car?

- 0
- 1
- 2
- 3
- 4

2d. How many times have you driven under the influence **during this study** and had a **crash** or hit something with your car?

- 0
- 1
- 2
- 3
- 4

2e. During times you have driven under the influence, **in all of your experience driving**, how many times have you had a **near-crash or close call**? For example, running off the road or drifting into an oncoming lane.

- 0
- 1
- 2
- 3
- 4

2f. How many times have you driven under the influence **during this study** and had a **near-crash or close call**?

- 0
- 1
- 2
- 3
- 4
- more

2g. How dangerous or risky would you say it is to drive while under the influence of drugs or alcohol?

Not risky		Slightly risky		Moderately risky		Very risky		Extremely risky
--------------	--	-------------------	--	---------------------	--	---------------	--	--------------------

2h. How dangerous or risky would you say it is to drive while using a cell phone?

_____ (where Not Risky = 0, Slightly Risky = 1, Moderately Risky = 2, Very Risky = 3, and Extremely Risky = 4)

(if you fall somewhere in between, it is appropriate to respond with a .5 designation following your ranking).

Not risky		Slightly risky		Moderately risky		Very risky		Extremely risky
--------------	--	-------------------	--	---------------------	--	---------------	--	--------------------

2i. How many times have you driven while talking on your cell phone?

- _____ Never
- _____ Once per month
- _____ More than once per month
- _____ Once per week
- _____ More than once per week
- _____ Almost daily or daily

3a. How often do you wear your safety belt when driving?

- _____ Never
- _____ Rarely
- _____ Occasionally
- _____ Usually
- _____ Always, I never drive without my safety belt on

3b. Why do you think this is your pattern of safety belt use?

3c. If your answer was other than always, what do you think it would take to get you to wear your safety belt more often?

3d. Why do you not always wear your safety belt? (Check all that apply)

- I don't believe it makes me safer
 I am concerned about getting trapped in a crash
 It is inconvenient
 It is uncomfortable
 I forget to put it on

4a. On average, how much stress did you feel during the last year?

<hr/>				
Not stressed	Slightly stressed	Moderately stressed	Very stressed	Extremely stressed

4b. How much is your driving affected by stress?

<hr/>				
Not affected	Slightly affected	Moderately affected	Very affected	Extremely affected

5a. To what degree do you think your driving was altered or different because you were participating in this study and your driving was monitored?

<hr/>				
Not altered	Slightly altered	Moderately altered	Very altered	Extremely altered

5b. How would you rate how safely you drove in the past year compared to all of your previous years of driving?

Not safe		Slightly safe		Moderately safe		Very safe		Extremely safe

5c. How would you rate your driving compared to other drivers?

Not better		Slightly better		Moderately better		Very better		Extremely better

5d. **For drivers of leased vehicles,** to what degree do you think your driving was altered or different because you were driving a vehicle that was not your own?

Not altered		Slightly altered		Moderately altered		Very altered		Extremely altered

6a. Is there any event or incident that happened in the past year that you would like to report at this time?

Approximate date: _____ Approximate time: _____

Description:

7a. Is there any event or incident that happened in the past year where you pushed the critical incident button that you would like to tell me about?

Approximate date: _____ Approximate time: _____

Description:

8a. How favorably would you rate your experience of participating in this study?

Not favorably	Slightly favorably	Moderately favorably	Very favorably	Extremely favorably
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8b. Is there anything in particular that you would like to bring to our attention?

9a. **For drivers of private vehicles,** how would you rate your experience with Hurleys?

Not favorably	Slightly favorably	Moderately favorably	Very favorably	Extremely favorably
---------------	--------------------	----------------------	----------------	---------------------

9b. Is there anything in particular that you would like to bring to our attention?

Driver Demographic Information

Subject ID # _____

Please answer each of the following items.

1. What is your age in years: _____
2. Gender: _____ Male _____ Female
3. What is your highest level of education?
 - a. Didn't complete high school
 - b. High school graduate
 - c. Some college
 - d. 2-year college degree/trade school
 - e. 4-year college degree
 - f. Masters degree
 - g. Professional degree
 - h. Doctorate degree
4. What is your occupation: _____
5. What group do you identify yourself with
 - a. Latino/Latina
 - b. African-American
 - c. Caucasian
 - d. Middle Eastern
 - e. Pacific Islander
 - f. Asian
 - g. Other _____
6. How many years have you been driving? _____
7. What type of driving do you usually do? (please indicate all that apply)
 - a. Around town driving
 - b. Commuting on freeways
 - c. Commuting on other main roads
 - d. Short distance travel (50-200 mile round trip)
 - e. Middle distance travel (201-500 mile round trip)
 - f. Long distance travel (>500 mile round trip)

Driving History – Subject Interview

In the past year, how many moving or traffic violations have you had? _____

What type of violation was it?

- (1). _____
- (2). _____
- (3). _____
- (4). _____
- (5). _____

In the past year how many accidents have you been in? _____

For each accident indicate the severity of the crash (select highest)

- a. Injury
- b. Tow-away (any vehicle)
- c. Police-reported
- d. Damage (any), but no police report

Using the diagram indicate each of the following: Category, Configuration, Accident type

	Accident 1	Accident 2	Accident 3	Accident 4	Accident 5
Accident Severity					
Accident Category					
Accident Configuration					
Accident Type					

Comments: _____

Post-Crash Interview Form

100-Car Crash Variables

Subject No. _____

Interviewer _____

Date _____

Driver's description of crash:

1. List the most Severe Injury in Crash

0 = No injury (O)

1 = Fatal (K)

2 = Visible signs of injury; e.g., bleeding wound or distorted member, or carried from scene (A).

3 = Other visible injury as bruises, abrasions, swelling, limping, etc. (B)

4 = No visible injury but complaint of pain or momentary unconsciousness (C)

2. What other vehicles/non-motorists were involved

1 = 1 vehicle (Subject vehicle only)

2 = 2 vehicles

3 = 3 vehicles

4 = 4 or more vehicles

5 = Subject vehicle + pedestrian

6 = Subject vehicle + pedalcyclist

7 = Subject vehicle + animal

8 = Other, specify

6. Date of crash

7. Day of week of crash

8. Time of crash

10. Jurisdiction where crash occurred

1 = Virginia

2 = Maryland

3 = DC

4 = other

11. Traffic control device present?

- 1 = No traffic control
- 2 = Officer or watchman
- 3 = Traffic signal
- 4 = Stop sign
- 5 = Slow or warning sign
- 6 = Traffic lanes marked
- 7 = No passing signs
- 8 = Yield sign
- 9 = One way road or street
- 10 = Railroad crossing with markings or signs
- 11 = Railroad crossing with signals
- 12 = Railroad crossing with gate and signals
- 13 = Other

12. Alignment of roadway at the scene?

- 1 = Straight level
- 2 = Curve level
- 3 = Grade straight
- 4 = Grade curve
- 5 = Hillcrest straight
- 6 = Hillcrest curve
- 7 = Dip straight
- 8 = Up curve [need definition]
- 9 = Other

13. Weather at the time of crash?

- 1 = Clear
- 2 = Cloudy
- 3 = Fog
- 4 = Mist
- 5 = Raining
- 6 = Snowing
- 7 = Sleet
- 8 = Smoke [or?] dust
- 9 = Other

14. Surface condition of the roadway at the time of crash?

- 1 = Dry
- 2 = Wet
- 3 = Snowy
- 4 = Icy
- 5 = Muddy
- 6 = Oily
- 7 = Other

15. Light level at the time of the crash?

- 1 = Dawn

- 2 = Daylight
- 3 = Dusk
- 4 = Darkness, lighted
- 5 = Darkness, not lighted

16. Kind of locality at the crash scene?

- 1 = School
- 2 = Church
- 3 = Playground
- 4 = Open country
- 5 = Business/industrial
- 6 = Residential
- 7 = Interstate
- 8 = Other
- 9 = *Construction zone [Added][?]*

17. Where in relation to a junction did the crash occur?

Non-Interchange Area

- 00 = Non-Junction
- 01 = Intersection
- 02 = Intersection-related
- 03 = Driveway, alley access, etc.
- 04 = Entrance/exit ramp
- 05 = Rail grade crossing
- 06 = On a bridge
- 07 = Crossover related
- 08 = Other, non-interchange area
- 09 = Unknown, non-interchange
- 20 = *Parking lot [Added]*

Interchange Area

- 10 = Non-Junction
- 11 = Intersection
- 12 = Intersection-related
- 13 = Driveway, alley access, etc.
- 14 = Entrance/exit ramp
- 16 = On a bridge
- 17 = Crossover-related
- 18 = Other location in interchange area
- 19 = Unknown, interchange area
- 99 = Unknown if interchange

18. What was the trafficway flow at the time of the crash?

- 1 = Not divided
- 2 = Divided (median strip or barrier)

3 = One-way traffic

19. What was the number of travel lanes at the time of the crash?

- 1 = 1
- 2 = 2
- 3 = 3
- 4 = 4
- 5 = 5
- 6 = 6
- 7 = 7
- 8 = 8+

21. What was the type of collision

- 1 = Rear-end (*striking*)
- 1b = Rear-end (*struck*)
- 2 = Angle
- 3 = Head-on
- 4 = Sideswipe, same direction
- 5 = Sideswipe, opposite direction
- 6 = Fixed object in road
- 7 = Train
- 8 = Noncollision
- 9 = Fixed object – off road
- 10 = Deer
- 11 = Other animal
- 12 = Pedestrian
- 13 = Bicyclist
- 14 = Motorcyclist
- 15 = Backed into
- 16 = Other

Driver/Vehicle 1 File

4. How many occupants in your vehicle?

6. What were you (driver) doing prior to the crash?

- 1 = Going straight ahead, constant speed
- 2 = Making right turn
- 3 = Making left turn
- 4 = Making U-turn
- 5 = Slowing or stopping
- 6 = Starting in traffic lane
- 7 = Starting from parked position
- 8 = Stopped in traffic lane]
- 9 = Ran off road right
- 10 = Ran off road left
- 11 = Parked

12 = Backing
13a = *Passing left*
13b = *Passing right*
14 = Changing lanes
15 = Other
16 = *Accelerating in traffic lane*
17 = *Entering a parked position*
18 = *Negotiating a curve*
19a = *Merging left*
19b = *Merging right*

9. What was the action by you or other driver that started the sequence of events leading to the crash? (Most likely filled out by Heather based on the driver's narrative)

This Vehicle Loss of Control Due to:

001 = Blow-out or flat tire
002 = Stalled engine
003 = Disabling vehicle failure (e.g., wheel fell off)
004 = Minor vehicle failure
005 = Poor road conditions (puddle, pothole, ice, etc.)
006 = Excessive speed
007 = Other or unknown reason
008 = Other cause of control loss
009 = Unknown cause of control loss

This Vehicle Traveling:

XXX = *Ahead, stopped on roadway more than 2 seconds*
XXX = *Ahead, decelerated and stopped on roadway 2 seconds or less*
XXX = *Ahead, traveling in same direction and decelerating*
XXX = *Ahead, traveling in same direction and accelerating*
XXX = *Ahead, traveling in same direction with slower constant speed*
XXX = *Behind, traveling in same direction and accelerating*
XXX = *Behind, traveling in same direction with higher constant speed*
XXX = *Behind, stopped on roadway*
010 = Over the lane line on the left side of travel lane
011 = Over the lane line on right side of travel lane
012 = Over left edge of roadway
013 = Over right edge of roadway
014 = Unknown which edge
015 = End departure
016 = Turning left at intersection
017 = Turning right at intersection
018 = Crossing over (passing through) intersection
018 = This vehicle decelerating
019 = Unknown travel direction
020a = *From adjacent lane (same direction), over left lane line behind lead vehicle, rear-end crash threat*

020b = From adjacent lane (same direction), over right lane line behind lead vehicle, rear-end crash threat

Other Vehicle in Lane:

030 = Ahead, stopped on roadway more than 2 seconds

031 = Ahead, decelerated and stopped on roadway 2 seconds or less

032 = Ahead, traveling in same direction and decelerating

033 = Ahead, traveling in same direction and accelerating

034 = Ahead, traveling in same direction with slower constant speed

035 = Behind, traveling in same direction and accelerating

036 = Behind, traveling in same direction with higher constant speed

037 = Behind, stopped on roadway

050 = Stopped on roadway

051 = Traveling in same direction with lower steady speed

052 = Traveling in same direction while decelerating

053 = Traveling in same direction with higher speed

054 = Traveling in opposite direction

055 = In crossover

056 = Backing

057 = Unknown travel direction of the other motor vehicle

Another Vehicle Encroaching into This Vehicle's Lane:

060a = From adjacent lane (same direction), over left lane line in front of this vehicle, rear-end crash threat

060b = From adjacent lane (same direction), over left lane line behind this vehicle, rear-end crash threat

060c = From adjacent lane (same direction), over left lane line, sideswipe threat

060d = From adjacent lane (same direction), over right lane line, sideswipe threat

060e = From adjacent lane (same direction), other

061a = From adjacent lane (same direction), over right lane line in front of this vehicle, rear-end crash threat

061b = From adjacent lane (same direction), over right lane line behind this vehicle, rear-end crash threat

061c = From adjacent lane (same direction), other

062 = From opposite direction over left lane line.

063 = From opposite direction over right lane line

064 = From parallel/diagonal parking lane

065 = Entering intersection—turning in same direction

066 = Entering intersection—straight across path

067 = Entering intersection – turning into opposite direction

068 = Entering intersection—intended path unknown

070 = From driveway, alley access, etc – turning into same direction

071 = From driveway, alley access, etc – straight across path

072 = From driveway, alley access, etc – turning into opposite direction

073 = From driveway, alley access, etc – intended path unknown

074 = From entrance to limited access highway

078 = Encroaching details unknown

Pedestrian, Pedalcyclist, or other Nonmotorist:

080 = Pedestrian in roadway

- 081 = Pedestrian approaching roadway
- 082 = Pedestrian in unknown location
- 083 = Pedalcyclist/other nonmotorist in roadway
- 084 = Pedalcyclist/other nonmotorist approaching roadway
- 085 = Pedalcyclist/or other nonmotorist unknown location
- 086 = Pedestrian/pedalcyclist/other nonmotorist—unknown location

Object or Animal:

- 087 = Animal in roadway
- 088 = Animal approaching roadway
- 089 = Animal unknown location
- 090 = Object in roadway
- 091 = Object approaching roadway
- 092 = Object unknown location

Other:

- 098 = Other event/not applicable
- 099 = Unknown critical event

10. What corrective action did you attempt to make prior to the crash?

- 0 = No driver present
- 1 = No avoidance maneuver
- 2 = Braking (no lockup)
- 3 = Braking (lockup)
- 4 = Braking (lockup unknown)
- 5 = Releasing brakes
- 6 = Steered to left
- 7 = Steered to right
- 8 = Braked and steered to left
- 9 = Braked and steered to right
- 10 = Accelerated
- 11 = Accelerated and steered to left
- 12 = Accelerated and steered to right
- 98 = Other actions
- 99 = Unknown if driver attempted any corrective action

Did your vehicle successfully respond to this corrective action or was this vehicular control maintained?

- 0 = No driver present
- 1 = Vehicle control maintained after corrective action
- 2 = Vehicle rotated (yawed) clockwise
- 3 = Vehicle rotated (yawed) counter-clockwise
- 4 = Vehicle slid/skid longitudinally – no rotation
- 5 = Vehicle slid/skid laterally – no rotation
- 9 = Vehicle rotated (yawed) unknown direction
- 20 = Combination of 2-9
- 94 = More than two vehicles involved
- 98 = Other or unknown type of vehicle control was lost after corrective action
- 99 = Unknown if vehicle control was lost after corrective action.

14. Were you physically or mentally impaired?

- 0 = None apparent
- 1 = Drowsy, sleepy, asleep, fatigued
- 2 = Ill, blackout
- 3a = *Angry*
- 3b = *Other emotional state*
- 4a = Drugs-medication
- 4b = Drugs-alcohol
- 5 = Other drugs (marijuana, cocaine, etc.)
- 6 = Restricted to wheelchair
- 7 = Impaired due to previous injury
- 8 = Deaf
- 50 = Hit-and-run vehicle
- 97 = Physical/mental impairment – no details
- 98 = Other physical/mental impairment
- 99 = Unknown physical/mental condition

21. Did you (driver) consume any alcohol prior to crash?

- 0 = None
- 1 = In vehicle without overt effects on driving
- 2 = In vehicle with overt effects on driving
- 3 = Reported by police
- 4 = Use not observed or reported, but suspected based on driver behavior.

22. Was your vision obscured by any obstacle prior to the crash?

- 0 = No obstruction
- 1 = Rain, snow, fog, smoke, sand, dust
- 2a = *Reflected glare*
- 2b = *Sunlight*
- 2c = *Headlights*
- 3 = Curve or hill
- 4 = Building, billboard, or other design features (includes signs, embankment)

- 5 = Trees, crops, vegetation
- 6 = Moving vehicle (including load)
- 7 = Parked vehicle
- 8 = Splash or spray of passing vehicle [any other vehicle]
- 9 = Inadequate defrost or defog system
- 10 = Inadequate lighting system
- 11 = Obstruction interior to vehicle
- 12 = Mirrors
- 13 = Head restraints
- 14 = Broken or improperly cleaned windshield
- 15 = Fog
- 50 = Hit-and- run vehicle
- 95 = No driver present
- 96 = Not reported
- 97 = Vision obscured – no details
- 98 = Other obstruction
- 99 = Unknown whether vision was obstructed

23. Were you distracted?

- 1) Cognitive distraction
 - a. Lost in thought
 - b. Looked but did not see
- 2) Passenger in vehicle
 - a. Passenger in adjacent seat
 - b. Passenger in rear seat
 - c. Child in adjacent seat
 - d. Child in rear seat
- 3) Object/animal/insect in Vehicle
 - a. Moving object in vehicle (i.e., object fell off seat when driver stopped hard at a traffic light)
 - b. Insect in vehicle
 - c. Pet in vehicle
 - d. Object dropped by driver
 - e. Reaching for object in vehicle (not cell phone)
- 4) Cell phone operations
 - a. Locating/reaching/answering cell phone
 - b. Dialing hand-held cell phone
 - c. Dialing hand-held cell phone using quick keys
 - d. Dialing hands-free cell phone using voice-activated software
 - e. Talking/listening
- 5) PDA operations
 - a. Locating/reaching PDA
 - b. Operating PDA
 - c. Viewing PDA
- 6) In-vehicle system operations
 - a. Adjusting climate control
 - b. Adjusting the radio
 - c. Inserting/retrieving cassette

- d. Inserting/retrieving CD
 - e. Adjusting other devices integral to vehicle (unknown which device)
 - f. Adjusting other known in-vehicle devices (text box to specify)
- 7) Dining
- a. Eating
 - b. Drinking
- 8) Smoking
- a. Reaching for cigar/cigarette
 - b. Lighting cigar/cigarette
 - c. Smoking cigar/cigarette
 - d. Extinguishing cigar/cigarette
- 9) External Distraction
- a. Looking at previous crash or highway incident
 - b. Pedestrian located outside the vehicle
 - c. Animal located outside the vehicle
 - d. Object located outside the vehicle
 - e. Construction zone

24. Were you engaging any unsafe driving behaviors that may have contributed to the crash?

Note: Analyst may code up to 3, in order of importance.

0 = None

1 = Exceeded speed limit

2 = Inattentive or distracted

3 = Exceeded safe speed but not speed limit

4 = Driving slowly; below speed limit

5 = Driving slowly in relation to other traffic; not below speed limit

6 = Illegal passing (i.e., across double line) 2 = Inattentive or distracted (coded in previous variable)

7 = Passing on right

8 = Other improper or unsafe passing

9 = Cutting in, too close in front of other vehicle

10 = Cutting in, too close behind other vehicle

11 = Making turn from wrong lane (e.g., across lanes)

12 = Did not see other vehicle during lane change or merge

13 = Driving in other vehicle's blind zone

14 = Aggressive driving, specific, directed menacing actions

15 = Aggressive driving, other; i.e., reckless driving without directed menacing actions

16 = Wrong side of road, not overtaking

17 = Following too close

18 = Failed to signal, or improper signal

19 = Improper turn: wide right turn

20 = Improper turn: cut corner on left turn

21 = Other improper turning

22 = Improper backing, did not see

23 = Improper backing, other

24 = Improper start from parked position

- 25 = Disregarded officer or watchman
- 26 = Signal violation, apparently did not see signal
- 27 = Signal violation, intentionally ran red light
- 28 = Signal violation, tried to beat signal change
- 29 = Stop sign violation, apparently did not see stop sign
- 30 = Stop sign violation, intentionally ran stop sign at speed
- 31 = Stop sign violation, "rolling stop"
- 32 = Other sign (e.g., Yield) violation, apparently did not see sign
- 33 = Other sign (e.g., Yield) violation, intentionally disregarded
- 34 = Other sign violation
- 35 = Non-signed crossing violation (e.g., driveway entering roadway)
- 36 = Right-of-way error in relation to other vehicle or person, apparent recognition failure (e.g., did not see other vehicle)
- 37 = Right-of-way error in relation to other vehicle or person, apparent decision failure (i.e., did see other vehicle prior to action but misjudged gap)
- 38 = Right-of-way error in relation to other vehicle or person, other or unknown cause
- 39 = Sudden or improper stopping on roadway
- 40 = Parking in improper or dangerous location; e.g., shoulder of Interstate
- 41 = Failure to signal with other violations or unsafe actions
- 42 = Failure to signal, without other violations or unsafe actions
- 43 = Speeding or other unsafe actions in work zone
- 44 = Failure to dim headlights
- 45 = Driving without lights or insufficient lights
- 46 = Avoiding pedestrian
- 47 = Avoiding other vehicle
- 48 = Avoiding animal
- 49 = Apparent unfamiliarity with roadway
- 50 = Apparent unfamiliarity with vehicle; e.g., displays and controls
- 51 = Apparent general inexperience driving
- 52 = Use of cruise control contributed to late braking
- 53 = Other, specify

25. Were there any vehicle malfunctions that contributed to the crash?

- 0 = None
- 1 = Tires
- 2 = Brake system
- 3 = Steering system
- 4 = Suspension
- 5 = Power train
- 6 = Exhaust system
- 7 = Headlights
- 8 = Signal lights
- 9 = Other lights
- 10 = Wipers
- 11 = Wheels
- 12 = Mirrors
- 13 = Driver seating and controls

- 14 = Body, doors
- 15 = Trailer hitch
- 50 = Hit-and-run vehicle
- 97 = Vehicle contributing factors, no details
- 98 = Other vehicle contributing factors
- 99 = Unknown if vehicle had contributing factors

26. Did you have a reason for avoiding, swerving, sliding?

- 0 = Not avoiding, swerving, or sliding
- 1 = Severe crosswind
- 2 = Wind from passing truck
- 3 = Slippery or loose surface
- 4 = Tire blow-out or flat
- 5 = Debris or objects in road
- 6 = Ruts, holes, bumps in road
- 7 = Animals in road
- 8 = Vehicle in road
- 9 = Phantom vehicle
- 10 = Pedestrian, pedalcyclist, or other non-motorist in road
- 11 = Water, snow, oil slick in road
- 50 = Hit and run vehicle
- 97 = Avoiding, swerving, or sliding, no details
- 98 = Other environmental contributing factor
- 99 = Unknown action

35. Were you using your cruise control? What speed?

- 0 = Cruise control off
- 1-97 = Set speed of cruise control, if activated.
- 98 = Cruise control activated, unknown set speed
- 99 = Unknown if cruise control is activated.

36. What was the duration of the latest principal sleep period?

37. How long have you been awake since this principal sleep period?

38. Did you take a nap prior to crash? What was the duration of nap prior to collision?

39. How long have you been awake since your nap?

V1 Occupant File

Information on occupants – number, seating position, injuries, etc. – will be available only for crashes. In-vehicle cameras will not show occupants other than the

driver, and thus no information regarding these other occupants will be available for near-crashes, incidents, and baseline epochs.

2. What were the occupant seating position(s)?

3. V1 Occupant Sex(C)

- 1 = Male
- 2 = Female
- 3 = Unknown

4. V1 Occupant Age (C)

5. V1 Occupant Safety Belt Usage (C)

- 1 = Lap/shoulder belt
- 2 = Child safety/booster seat with safety belt
- 3 = Child safety/booster seat without safety belt
- 4 = Other safety belt used (describe)
- 5 = None used
- 99 = Unknown if used.

6. V1 Occupant Injury Severity (C)

- 0 = No injury (O)
- 1 = Fatal (K)
- 2 = Visible signs of injury; e.g., bleeding wound or distorted member, or carried from scene (A).
- 3 = Other visible injury as bruises, abrasions, swelling, limping, etc. (B)
- 4 = No visible injury but complaint of pain or momentary unconsciousness (C)

7. V1 Occupant Injury Narrative (C)

Driver/Vehicle 2 File

1. What other type of vehicles were involved in the crash?

- 1 = Automobile
- 2 = Van (minivan or standard van)
- 3 = Pickup truck
- 4 = Bus (transit or motor coach)
- 5 = School bus
- 6 = Single-unit straight truck
- 7 = Tractor-trailer
- 8 = Motorcycle or moped
- 9 = Emergency vehicle (police, fire, EMS) in service
- 10 = Other vehicle type
- 11 = Pedestrian
- 12 = Cyclist
- 13 = Animal
- 99 = Unknown vehicle type

2. What was the other driver(s) gender?

- 1 = Male
- 2 = Female
- 3 = Unknown

3. What were the other driver/pedestrian age(s)?

4. What was Vehicle 2 doing prior to the collision? (Repeat for each other vehicle listed by participant)

- 1 = Going straight ahead
- 2 = Making right turn
- 3 = Making left turn
- 4 = Making U-turn
- 5 = Slowing or stopping
- 6 = Starting in traffic lane
- 7 = Starting from parked position
- 8 = Stopped in traffic lane]
- 9 = Ran off road right
- 10 = Ran off road left
- 11 = Parked
- 12 = Backing
- 13 = Passing
- 14 = Changing lanes
- 15 = Other
- 16 = *Accelerating in traffic lane*
- 17 = *Entering a parked position*
- 18 = *Negotiating a curve*
- 19 = *Merging*

7. What corrective action was taken by Vehicle 2? (Repeat for all other vehicles)

- 0 = No driver present
- 1 = No avoidance maneuver
- 2 = Braking (no lockup)
- 3 = Braking (lockup)
- 4 = Braking (lockup unknown)
- 5 = Releasing brakes
- 6 = Steered to left
- 7 = Steered to right
- 8 = Braked and steered to left
- 9 = Braked and steered to right
- 10 = Accelerated
- 11 = Accelerated and steered to left
- 12 = Accelerated and steered to right
- 98 = Other actions
- 99 = Unknown if driver attempted any corrective action

8. Did you believe that driver 2 was mentally or physically impaired? (Repeat for other vehicle drivers)

- 0 = None apparent
- 1 = Drowsy, sleepy, asleep, fatigued
- 2 = Ill, blackout
- 3a = *Angry*
- 3b = *Other emotional state*
- 4 = Drugs-medication
- 5 = Other drugs (marijuana, cocaine, etc.)
- 6 = Restricted to wheelchair
- 7 = Impaired due to previous injury
- 8 = Deaf
- 50 = Hit-and-run vehicle
- 97 = Physical/mental impairment – no details
- 98 = Other physical/mental impairment
- 99 = Unknown physical/mental condition

9. Do you believe or suspect alcohol use?

- 0 = None known
- 1 = Observed or reported by police
- 2 = Purported (e.g., by Subject Driver)

10. Do you believe that driver 2's vision was obscured? By what?

- 0 = No obstruction
- 1 = Rain, snow, fog, smoke, sand, dust
- 2a = *Reflected glare*
- 2b = *Sunlight*
- 2c = *Headlights*
- 3 = Curve or hill
- 4 = Building, billboard, or other design features (includes signs, embankment)

- 5 = Trees, crops, vegetation
- 6 = Moving vehicle (including load)
- 7 = Parked vehicle\
- 8 = Splash or spray of passing vehicle [any other vehicle]
- 9 = Inadequate defrost or defog system
- 10 = Inadequate lighting system
- 11 = Obstruction interior to vehicle
- 12 = Mirrors
- 13 = Head restraints
- 14 = Broken or improperly cleaned windshield
- 15 = Fog
- 50 = Hit-and-run vehicle
- 95 = No driver present
- 96 = Not reported
- 97 = Vision obscured – no details
- 98 = Other obstruction
- 99 = Unknown whether vision was obstructed

11. Do you believe driver 2 was distracted?

- 0 = Not distracted
- 1 = Looked but did not see
- 2 = NOT USED [for consistency with GES]
- 3 = By other occupants
- 4 = By moving object in vehicle
- 5 = While talking or listening to phone
- 6 = While dialing phone
- 7 = While adjusting climate control
- 8a = *While adjusting radio*
- 8b = *While adjusting cassette or CD*
- 9 = While using other devices integral to vehicle
- 10 = While using or reaching for other devices
- 11 = Drowsy, sleepy, asleep, fatigued
- 12a = *Previous crash or highway incident*
- 12b = *Other outside person or object*
- 13a = *Eating*
- 13b = *Drinking*
- 14 = Smoking related
- 95 = No driver present
- 96 = Not reported
- 97 = Inattentive or lost in thought
- 98 = Other distraction or inattention
- 99 = Unknown if distracted

12. Do you believe that Driver 2 was exhibiting any unsafe actions?

Note: Analyst may code up to 3, in order of importance.

- 0 = None
- 1 = Exceeded speed limit
- 2 = Inattentive or distracted (coded in previous variable)

- 3 = Exceeded safe speed but not speed limit
- 4 = Driving slowly; below speed limit
- 5 = Driving slowly in relation to other traffic; not below speed limit
- 6 = Illegal passing (i.e., across double line)
- 7 = Passing on right
- 8 = Other improper or unsafe passing
- 9 = Cutting in, too close in front of other vehicle
- 10 = Cutting in, too close behind other vehicle
- 11 = Making turn from wrong lane (e.g., across lanes)
- 12 = Did not see other vehicle during lane change or merge
- 13 = Driving in other vehicle's blind zone
- 14 = Aggressive driving, specific, directed menacing actions
- 15 = Aggressive driving, other; i.e., reckless driving without directed menacing actions
- 16 = Wrong side of road, not overtaking
- 17 = Following too close
- 18 = Failed to signal, or improper signal
- 19 = Improper turn: wide right turn
- 20 = Improper turn: cut corner on left turn
- 21 = Other improper turning
- 22 = Improper backing, did not see
- 23 = Improper backing, other
- 24 = Improper start from parked position
- 25 = Disregarded officer or watchman
- 26 = Signal violation, apparently did not see signal
- 27 = Signal violation, intentionally ran red light
- 28 = Signal violation, tried to beat signal change
- 29 = Stop sign violation, apparently did not see stop sign
- 30 = Stop sign violation, intentionally ran stop sign at speed
- 31 = Stop sign violation, "rolling stop"
- 32 = Other sign (e.g., Yield) violation, apparently did not see sign
- 33 = Other sign (e.g., Yield) violation, intentionally disregarded
- 34 = Other sign violation
- 35 = Non-signed crossing violation (e.g., driveway entering roadway)
- 36 = Right-of-way error in relation to other vehicle or person, apparent recognition failure (e.g., did not see other vehicle)
- 37 = Right-of-way error in relation to other vehicle or person, apparent decision failure (i.e., did see other vehicle prior to action but misjudged gap)
- 38 = Right-of-way error in relation to other vehicle or person, other or unknown cause
- 39 = Sudden or improper stopping on roadway
- 40 = Parking in improper or dangerous location; e.g., shoulder of Interstate
- 41 = Failure to signal with other violations or unsafe actions
- 42 = Failure to signal, without other violations or unsafe actions
- 43 = Speeding or other unsafe actions in work zone
- 44 = Failure to dim headlights
- 45 = Driving without lights or insufficient lights
- 46 = Avoiding pedestrian

- 47 = Avoiding other vehicle
- 48 = Avoiding animal
- 49 = Apparent unfamiliarity with roadway
- 50 = Apparent unfamiliarity with vehicle; e.g., displays and controls
- 51 = Apparent general inexperience driving
- 52 = Use of cruise control contributed to late braking
- 53 = Other, specify

13. Do you believe that there were any vehicle malfunctions on Vehicle 2 that contributed to the crash?

- 0 = None
- 1 = Tires
- 2 = Brake system
- 3 = Steering system
- 4 = Suspension
- 5 = Power train
- 6 = Exhaust system
- 7 = Headlights
- 8 = Signal lights
- 9 = Other lights
- 10 = Wipers
- 11 = Wheels
- 12 = Mirrors
- 13 = Driver seating and controls
- 14 = Body, doors
- 15 = Trailer hitch
- 50 = Hit-and-run vehicle
- 97 = Vehicle contributing factors, no details
- 98 = Other vehicle contributing factors
- 99 = Unknown if vehicle had contributing factors

14. Do you believe that Driver 2 was avoiding, swerving, or sliding for a specific reason?

- 0 = Not avoiding, swerving, or sliding
- 1 = Severe crosswind
- 2 = Wind from passing truck
- 3 = Slippery or loose surface
- 4 = Tire blow-out or flat
- 5 = Debris or objects in road
- 6 = Ruts, holes, bumps in road
- 7 = Animals in road
- 8 = Vehicle in road
- 9 = Phantom vehicle
- 10 = Pedestrian, pedalcyclist, or other nonmotorist in road
- 11 = Water, snow, oil slick in road
- 50 = Hit and run vehicle
- 97 = Avoiding, swerving, or sliding, no details
- 98 = Other environmental contributing factor

99 = Unknown action

V2 Occupant File

Information on V2 occupants – number, seating position, injuries, etc. – will be available only for crashes. Subject vehicle cameras will not show occupants of the other vehicle, and thus no information regarding these other occupants will be available for near-crashes, incidents, and baseline epochs. Crash PARs, and comparable data collected for non-police-reported crashes, will be the source of occupant information.

- 1. How many occupants in vehicle 2? (Repeat for each vehicle involved)**
- 2. Where were the occupant seating position(s)?**
- 3. What was the gender of the occupant(s)??**
- 4. What was the approximate or specific age of these occupants?**
- 5. Were the occupants using safety belts?**
 - 1 = Lap/shoulder belt
 - 2 = Child safety/booster seat with safety belt
 - 3 = Child safety/booster seat without safety belt
 - 4 = Other safety belt used (describe)
 - 5 = None used
 - 99 = Unknown if used.
- 6. Were the occupants injured?**
 - 0 = No injury (O)
 - 1 = Fatal (K)
 - 2 = Visible signs of injury; e.g., bleeding wound or distorted member, or carried from scene (A).
 - 3 = Other visible injury as bruises, abrasions, swelling, limping, etc. (B)
 - 4 = No visible injury but complaint of pain or momentary unconsciousness (C)

Air Bag Deployment

1. At the time of the accident, what was your body/head position? Were you leaning forward, back on the head rest, etc.???

2. Did you have radio on? What was the general volume, could you hold a conversation with it on?

3. Were the windows up or down?

Safety Belt Questionnaire

- 1) In general, how often do you use your safety belt?
- a. Always use my safety belt
 - b. Typically use my safety belt, with a few exceptions
 - c. Occasionally use my safety belt
 - d. Rarely use my safety belt
 - e. Never use my safety belt
 - f. Don't know

If you answered a or b, please continue with Question 2-4.
If you answered c, d, or e, please skip to Question 5.

- 2) For how long have you been wearing a safety belt regularly?
- a. Started within the last month
 - b. One to six months
 - c. Six months to a year
 - d. 1-3 years
 - e. More than 3 years
 - f. Don't know
- 3) Was there a particular event that caused you to wear your belt more?
- a. No
 - b. Yes, I had an accident
 - c. Yes, I was stopped by police for not wearing a belt
 - d. Yes, I received a lot of pressure from family/friends to do so
 - e. Yes, other (please specify): _____
 - f. Don't know

- 4) Since you started wearing your safety belt more often, do passengers wear theirs more when they ride with you?
- a. Yes, because I ask them
 - b. Yes, they seem to buckle up when I do
 - c. No
 - d. About the same as before
 - e. Don't know/haven't paid attention

(full-time/majority users are now finished with safety belt questions)

- 5) When you don't use your safety belt why don't you? (Circle all that apply)
- a. Forget

- b. Uncomfortable/doesn't fit properly
- c. Messes clothing
- d. Only needed on certain road types
- e. Just a short trip
- f. No safety benefit/won't do any good
- g. Hassle/annoying to use
- h. Hazardous/more dangerous than not wearing belt
- i. Not using is my choice/doesn't affect anyone else
- j. When it's my time to go, it won't matter whether I have my belt on
- k. Other (please specify) _____
- l. Don't know

- 6) Below are some ways of encouraging people to wear their safety belts more. Which would be effective in getting you to wear your safety belt?
- a. Primary law, where police can pull you over just for not wearing a safety belt
 - b. Advanced safety belt reminders, which would include lights and/or a sound and stay on up to one minute after starting the vehicle or you fastened your belt
 - c. Advanced safety belt reminders, which would include lights and/or a sound and stay on until you fasten your belt
 - d. Other (please specify): _____
 - e. Nothing would get me to wear my belt more
 - f. Don't know

- 7) Of those you chose in Question 6, which would be most effective? a b c d

APPENDIX A: INFORMED CONSENT FOR DRIVERS OF LEASED VEHICLES

INFORMED CONSENT FOR PARTICIPANTS IN RESEARCH PROJECTS INVOLVING HUMAN SUBJECTS

Title of Project: Naturalistic Driving Study

Research Conducted by: Virginia Tech Transportation Institute (VTTI)

Research Sponsored by: National Highway Traffic Safety Administration (NHTSA)

Investigators: Dr. Tom Dingus, Dr. Vicki Neale, Sheila Klauer, Dr. Ron Knipling, Heather Foster

I. PURPOSE OF THIS RESEARCH PROJECT

The objective of this study is to collect data on driving behavior. There are no special tasks for the driver to perform; instead, the driver is requested to merely drive as they regularly would to their normal destinations. This instrumentation is designed such that it will in no way interfere with the driving performance of the vehicle and will not obstruct the driver in any way. Due to the number of vehicles that are being instrumented and the time period involved, it is likely that crashes and the events leading up to them will be recorded.

One hundred high-mileage drivers are being recruited to participate in this research. All age groups and both men and women are being asked to participate. To participate, drivers must have a valid drivers' license and own a vehicle of which they are the primary driver for the experimental period of one year.

II. PROCEDURES AND SUBJECT RESPONSIBILITIES

The following describes procedures for the study and participant responsibilities:

Preparation for study:

1. Review entire study information package.
2. Read this informed consent form carefully; make a note of any questions. You may call Heather Foster of VTTI (703-538-8447) to discuss any questions.
3. Sign and date this form.
4. Ensure that any person likely to drive the instrumented vehicle has signed this consent form. (If you wish to add another driver at a later time, an informed-consent form can be obtained from VTTI.)
5. Provide close-up pictures (head-shots) of all consenting drivers.

In-processing (requires two hours):

6. Call Heather Foster of VTTI at 703-538-8447 to schedule an appointment for in-processing.

In-processing will ordinarily be scheduled for 8-10 a.m. or 4-6 p.m. on selected weekdays, and 9-11 a.m. on Saturdays, at the VT Northern Virginia Center, 7054

Haycock Road, Falls Church, VA 22043. (Parking is available in the Visitors Parking Lot.)

7. Bring the following to the subject in-processing:
 - Signed informed consent form (this document)
 - Valid driver's license
 - Social Security Number
 - Two forms of identification
8. Listen to a short overview orientation to the study, and "Q&A" discussion. Sign remaining administrative forms; a copy of all signed forms will be provided to you for your records.
9. Review insurance protocol for the leased vehicle.
10. Take a vision exam.
11. Take a hearing exam. (Note: a free hearing exam is available for all prospective drivers, family members, and other frequent passengers, provided they agree to the re-testing in the event of an air bag deployment.)
12. Complete surveys regarding your health, sleep hygiene, stress levels, overall personality, and driving behaviors and practices.
13. Take one or more brief performance tests.
14. Schedule VTTI delivery of the leased vehicle to your home or workplace.

Data collection during driving:

15. Wear your safety belt at all times.
16. Drive your vehicle as you normally would.
17. Do not wear sunglasses unless absolutely necessary.
18. In the event of a safety-related incident, [i.e. a crash, near-crash, driving error, or unsafe condition involving you vehicle or adjacent vehicles], press the red incident button located above the rear-view mirror after the incident as soon as it is safe to do so. For one minute, a microphone (directed toward the driver) will be activated; during this time, please briefly describe what happened, and why. In particular, what was the driving error that caused the incident?

Data downloading:

Note: the location of your vehicle will be known to VTTI researchers via a radio transmitter providing Global Positioning System (GPS) coordinates. This information will be used to locate vehicles for data downloading.

19. Permit VTTI researchers to access the vehicle (at your home or work location) every 1-4 weeks to download data. Most data downloads will require a data line to be plugged into a data port near the vehicle's rear license plate on the outside of the vehicle. (No access to the inside of the vehicle is required.) Subject to your approval, data downloads will be completed between 7 a.m. and 11 p.m.

Equipment and vehicle maintenance:

20. In the event of equipment malfunction or damage, notify VTTI as soon as possible.
21. Permit a service call at your home or office for repairs (if preferred, vehicle may be brought to Hurley's). If repairs cannot be made in a service call, bring the vehicle to Hurley's for repairs. VTTI will provide \$10 to cover Metro fare or other transportation needs.

22. Buy regular, unleaded gasoline for the vehicle. Perform regular safety checks; e.g., once monthly, check tire pressure, oil level, and other fluids. Have oil changes and other preventive maintenance performed per a schedule and instructions provided to you by VTTI.

In the event of a crash: Study Procedures (applies to all collisions, regardless of severity):

23. Contact VTTI as soon as possible after the crash. (Accident reporting instructions and phone numbers will be left in the glove box of the leased vehicle.)
24. Participate in a short phone interview with VTTI about the crash. In addition, since you are driving a vehicle owned by the State of Virginia, there are two reporting requirements following accidents, one for this study and one for the state (Virginia Tech Motor Pool), which will be explained to you during in-processing.
25. Schedule an appointment for hearing re-testing, to be conducted **as soon as possible** after the crash. Re-testing is conducted at Professional Hearing Services (6231 Leesburg Pike Suite 512 Falls Church, VA 22044 Phone 703-536-1666). Re-testing results will be provided to you and to VTTI.
26. Encourage all passengers whose hearing has been tested to schedule this re-testing.
27. If the crash is police reported, request a copy of the Police Accident Report from the police, and provide a copy to VTTI. VTTI will remove all personal identifiers to ensure confidentiality. "Personal identifiers" include names, addresses, phone numbers, and license plate numbers.
28. Request and provide copies of medical report(s) associated with your crash injuries and treatment. For some crashes, crash and injury information may already be available to NHTSA, and thus to this study, in conjunction with other NHTSA-sponsored studies in the Northern Virginia area.
29. Permit VTTI and/or Hurley's to check and test the vehicle instrumentation.

In the event of a crash: Virginia Tech Motor Pool Procedures

30. Follow the instructions in the glove compartment.
31. Contact VTTI as soon as possible, we will assist you in filing the Virginia Tech Motor Pool accident report.

In the event of an air bag deployment:

32. Permit a Special Crash Investigation team from NHTSA to inspect the vehicle.
33. Participate in an in-person interview with the Crash Investigation team.

Vehicle Return:

VTTI will contact you at the end of the 12-month study, to schedule out-processing and return of the leased vehicle.

34. Bring your leased vehicle to the VT North Virginia Center to return. VTTI will provide \$10 to cover Metro fare or other transportation.

Out-processing/study completion (requires one hour):

35. Complete out-processing administrative paperwork.
36. Complete short questionnaires regarding stress levels, driving behavior and

performance over the past year, and study evaluation.

Equipment Installation and Data Collection

You are being asked to drive with the instrumentation for approximately one year. The data on the vehicle will be downloaded via a data port located behind the rear license plate or via short range wireless communication (if there is no access to the vehicle). Once the data is downloaded, it will be stored on a project specific data server that will be accessed only by research staff affiliated with the project.

The data collection system is designed to require no maintenance and will not require you to perform any maintenance. However, if a diagnostic check of the data confirms a disruption of the data collection, a hardware engineer will be assigned to correct the problem. To perform the maintenance, VTTI or Hurley's will contact you to receive permission to work on the vehicle and schedule the repair. We will try to avoid interfering with your commuting schedule.

Automobile Insurance

In the Commonwealth of Virginia, responsibility for automobile insurance resides with the owner of the vehicle.

In the event of an accident or injury in a Virginia Tech automobile, the University will provide automobile liability coverage for property damage and personal injury. The total policy amount per occurrence is \$2,000,000. This coverage (unless the other party was at fault, which would mean all expense would go to the insurer of the other party's vehicle) would apply in case of an accident for all volunteers and would cover medical expenses up to the policy limit. In the event of an accident, you must notify the police and the VT Motor Pool (contact information will be left in the glove compartment of the leased vehicle).

VT also carries as a part of its automobile liability insurance a "Med Pay" endorsement that will pay up to \$5,000 in medical expenses, until fault in an accident is determined, at which time all medical expenses would go to the insurer of the vehicle at fault.

If you are working as an employee for another company, you may be deemed to be driving in the course of your employment, and your employer's worker's compensation provisions may apply in lieu of the Virginia Tech and Commonwealth of Virginia insurance provisions, in case of an accident. The particular circumstances under which worker's compensation would apply are specified in Virginia law. If worker's compensation provisions do not apply in a particular situation, then Virginia Tech and Commonwealth of Virginia insurance will provide coverage.

Medical Insurance

Participants in a study are considered volunteers, regardless of whether they receive payment for their participation; under Commonwealth of Virginia law, workers compensation does not apply to volunteers; therefore, if not in an automobile, the participants are responsible for their own medical insurance for bodily injury. Appropriate health insurance is strongly recommended to cover these types of expenses.

If you should become injured in an accident, whether in or out of an automobile, the medical treatment available to you would be that provided to any person by emergency medical services in the vicinity where the accident occurs.

A Virginia Tech automobile accident report form is located in the glove compartment of the vehicle you will be driving and outlines what you should do if you become involved in an accident and are not incapacitated.

Automatic Collision Notification

The vehicle will also be equipped with an automatic collision notification system, triggered by collision impacts. The system is intended to notify VTTI in the event of a collision impact. When serious impacts are detected by VTTI staff, they will notify local emergency services. *However, VTTI cannot guarantee continuous 24-hour coverage or coverage of all vehicle locations.* Therefore, in the event of a crash, you should not expect an emergency response based on this system. *Notify police and emergency services as you otherwise would following a crash.* However, this automatic collision notification system *may* enable emergency service to be dispatched to you faster after a crash.

III. RISKS

The risk to you is no more than you would normally incur while driving. All data collection equipment is mounted such that, to the greatest extent possible, it does not pose a hazard in any foreseeable way. None of the data collection equipment will interfere with any part of your normal field of view. The addition of the data collection systems to the vehicle will in no way affect the operating or handling characteristics of the vehicle.

Please note that you are being asked not to wear sunglasses unless absolutely necessary; however, if at any time you are suffering from glare problems (e.g., from the sun shining directly into your face) and cannot see the roadway and your surrounding environment, sunglasses are recommended.

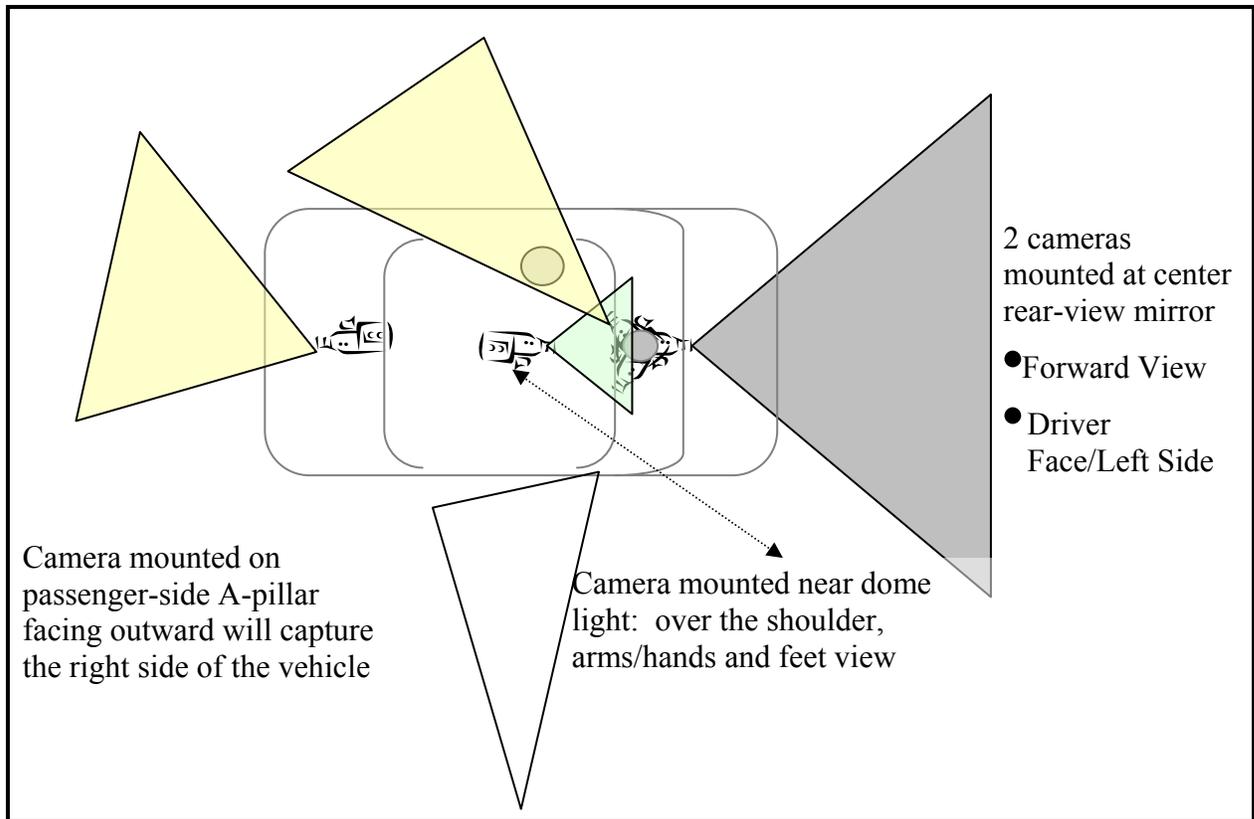
IV. BENEFITS

While there are no direct benefits to you from this research, you may find the experiment interesting. No promise or guarantee of benefits is being made to encourage participation. Your participation will help to improve the body of knowledge regarding driving behavior and performance.

V. EXTENT OF ANONYMITY AND CONFIDENTIALITY

Video information will be taken during the course of data collection. The data gathered in this experiment will be treated with confidentiality. Driver names will be separated from the collected data. A coding scheme will be employed to identify the data by subject number only (e.g., Driver No. 3).

While you are driving the vehicle, a camera will record your face and the left exterior side of vehicle, the right exterior side of the vehicle, the forward view, the rear-view, and the instrument panel view. This is shown below. Note that no other passengers in the vehicle will be within the camera view. Also, there is audio recording capability in the vehicle, but it will only record for one minute when you activate the incident push button. Please note that the audio microphone is directional and will only record your voice from the driver's seat.



The data from this study will be stored in a secured area at the Virginia Tech Transportation Institute. Access to the data will be under the supervision of Dr. Tom Dingus, Dr. Vicki Neale, Sheila Klauer, Dr. Ron Knipling, and Heather Foster. Data reductionists assigned to work on this project will also have access to your data. Data reduction will consist of examining driving performance under various conditions. During the course of this study, the video will not be released to anyone other than individuals working on the project without your written consent. Following the study, some data may be made available to the contact sponsor, the National Highway Traffic Safety Administration, for research purposes only. Please note that NHTSA is under the same obligation to keep your data confidential.

If you are involved in a crash while participating in this study, the data collection equipment in your vehicle will likely capture the events leading up to the event. The data collection equipment SHOULD NOT be given to police officers or any other party. You are under NO LEGAL OBLIGATION to mention that you are participating in this study.

We will do everything we can to keep others from learning about your participation in the research. To further help us protect your privacy, the investigators have obtained a Confidentiality Certificate from the Department of Health and Human Services. With this Certificate, the investigators cannot be forced (for example by court subpoena) to disclose information that may identify you in any Federal, State, or local civil, criminal, administrative, legislative, or other proceedings. Disclosure will be necessary, however, upon request of DHHS for audit or program evaluation purposes.

You should understand that a Confidentiality Certificate does not prevent you or a member of your family from voluntarily releasing information about yourself or your involvement in this research. Note however, that if an insurer, employer, or someone else learns about your participation, and *obtains your consent* to receive research information, then the investigator may not use the Certificate of Confidentiality to withhold this information. This means that you and your family must also actively protect your own privacy. In addition to the Confidentiality Certificate, we have also obtained approval through the NHTSA Human Use Review Panel for your protection.

Finally, you should understand that the investigator is not prevented from taking steps, including disclosing information to authorities, to prevent serious harm to yourself or others. For example, if we learned about offenses such as child abuse or habitual driving under the influence, we would take appropriate action to protect you and someone else, even though we will still maintain privacy of the data.

VI. COMPENSATION

You will be compensated \$125 per month for approximately 12 months of participation in this study. If you choose to withdraw from participation prior to the 12-month period, you will be compensated for the proportion of time that you have participated. You will also receive a \$300 study completion bonus at the end of the 12-month period and equipment de-installation. This bonus will be provided at the out-processing.

In addition to this compensation, you will be given \$10 for travel on the days that instrumentation is installed and removed.

VII. FREEDOM TO WITHDRAW

You are free to withdraw from the study at any time without penalty. If you choose to withdraw, you will be compensated for the portion of the time of the study.

VTTI has the right to terminate your participation in the study at any time. For example, VTTI may withdraw you from the study if the quantity or quality of data is insufficient for study purposes or if you pose a threat to yourself or to others. Subjects withdrawn from the study will receive pro-rated payment (at \$125 per month) and will be required to schedule equipment de-installation as soon as possible.

VIII. APPROVAL OF RESEARCH

This research project has been approved, as required, by the Institutional Review Board for Research Involving Human Subjects at Virginia Polytechnic Institute and State University, by the Virginia Tech Transportation Institute.

IRB Approval Date

Approval Expiration Date

IX. DRIVER'S RESPONSIBILITIES

I voluntarily agree to participate in this study. I understand the procedures and responsibilities described above, in particular in **Section II, Procedures and Subject Responsibilities.**

X. DRIVER'S PERMISSION

I have read and understand the Informed Consent and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent:

Signature of Driver: _____
Date: _____

Signature of Additional Driver:

Date:

Signature of Legal Guardian if any additional driver is minors:

Date:

Signature of Additional Driver:

Date:

Signature of Legal Guardian if any additional driver is minors:

Date:

Signature of Additional Driver:

Date:

Signature of Legal Guardian if any additional driver is minors:

Date:

Should I have any questions about this research or its conduct, I may contact:

Heather Foster 703-[538-8447](tel:538-8447) hfooster@vtti.vt.edu
Research Specialist/Northern Virginia Center, Virginia Tech Transportation Institute

Dr. Ronald R. Knipling 703-538-8439 rknipping@vtti.vt.edu
Northern Virginia Site Manager/Falls Church, Virginia Tech Transportation Institute

Dr. Vicki L. Neale 540-231-1514 vneale@vtti.vt.edu
Co- Principal Investigator, Virginia Tech Transportation Institute

Dr. David M. Moore 540-231-4991 moored@vt.edu
Chair, IRB
Office of Research Compliance
Research & Graduate Studies

All drivers must be given a complete copy (or duplicate original) of the signed Informed Consent.

[REVISED 10-22-02]

APPENDIX A: INFORMED CONSENT FOR DRIVERS OF PRIVATE VEHICLES

INFORMED CONSENT FOR PARTICIPANTS IN RESEARCH PROJECTS INVOLVING HUMAN SUBJECTS

Title of Project: Naturalistic Driving Study

Research Conducted by: Virginia Tech Transportation Institute (VTTI)

Research Sponsored by: National Highway Traffic Safety Administration (NHTSA)

Investigators: Dr. Tom Dingus, Dr. Vicki Neale, Sheila Klauer, Dr. Ron Knipling, Heather Foster

I. PURPOSE OF THIS RESEARCH PROJECT

The objective of this study is to instrument drivers' personal vehicles to collect data on driving behavior. There are no special tasks for the driver to perform; instead, the driver is requested to merely drive as they regularly would to their normal destinations. This instrumentation is designed such that it will in no way interfere with the driving performance of the vehicle and will not obstruct the driver in any way. Due to the number of vehicles that are being instrumented and the time period involved, it is likely that crashes and the events leading up to them will be recorded.

One hundred high-mileage drivers are being recruited to participate in this research. All age groups and both men and women are being asked to participate. To participate, drivers must have a valid drivers' license and own a vehicle of which they are the primary driver for the experimental period of one year.

II. PROCEDURES AND SUBJECT RESPONSIBILITIES

The following describes procedures for the study and participant responsibilities:

Preparation for study:

1. Review entire study information package
2. Read this informed consent form carefully; make a note of any questions. You may call Heather Foster of VTTI (703-538-8447) to discuss any questions.
3. Sign and date this form.
4. Ensure that any person likely to drive the instrumented vehicle has signed this informed consent form. (If you wish to add another driver at a later time, an informed consent form can be obtained from VTTI.)
5. Provide close-up pictures (head-shots) of all consenting drivers.

In-processing (requires two hours):

6. Call Heather Foster of VTTI at 703-538-8447 to schedule an appointment for in-processing.

In-processing will ordinarily be scheduled for 8-10 a.m. or 4-6 p.m. on weekdays, and 9-11 a.m. on Saturdays, at the VT Northern Virginia Center, 7054 Haycock Road, Falls Church, VA 22043. (Parking is available in the Visitors Parking Lot)

7. Bring the following to the subject in-processing:

Signed informed consent form (this document)

Valid driver's license

Proof of insurance for your vehicle

Vehicle registration

Social Security Number

Two forms of identification

8. Listen to a short overview orientation to the study, and Q&A discussion. Sign remaining administrative forms; a copy of all signed forms will be provided to you for your records.
9. Take a vision exam.
10. Take a hearing exam. (Note: A free hearing exam is available for all prospective drivers, family members, and other frequent passengers, provided they agree to the re-testing in the event of a crash.)
11. Complete surveys regarding your health, sleep hygiene, stress levels, overall personality, and driving behaviors and practices.
12. Take one or more brief performance tests.
13. Schedule your vehicle for equipment installation. (see below)

Equipment installation:

14. Bring your vehicle to Hurley's Auto Audio (1524 Springhill Road, McLean, VA 22102, Phone 703-790-8744) for equipment installation this will require a full day. We will provide \$10 to cover Metro fare or other transportation needs.

Data collection during driving:

15. Wear your safety belt at all times.
16. Drive your vehicle as you normally would.
17. Do not wear sunglasses unless absolutely necessary
18. In the event of a safety-related incident, [i.e. a crash, near-crash, driving error, or unsafe condition involving your vehicle or adjacent vehicles], press the red incident button located above the rear-view mirror after the incident as soon as it is safe to do so. For one minute, a microphone (directed toward the driver) will be activated; during this time, please briefly describe what happened, and why. In particular, what was the driving error that caused the incident?

Data downloading:

Note: the location of your vehicle will be known to VTTI researchers via a radio transmitter providing Global Positioning System coordinates. This information will be used to locate vehicles for data downloading.

19. Permit VTTI researchers to access your vehicle (at your home or work location) every 1-4 weeks to download data. Most data downloads will require a data line to be plugged into a data port near the vehicle license plate on the outside of the

vehicle. (No access to the inside of the vehicle is required.) Subject to your approval, data downloads will be completed between 7 a.m. and 11 p.m.

Equipment maintenance:

20. In the event of equipment malfunctioning or damage, notify VTTI as soon as possible.
21. Permit a service call at your home or office for repairs (if preferred, vehicle may be brought to Hurley's). If repairs cannot be made in a service call, bring the vehicle in to Hurley's for repairs. We will provide \$10 to cover Metro fare or other transportation needs.

In the event of a crash (applies to all collisions, regardless of severity):

22. Contact VTTI as soon as possible after the crash. (Accident reporting instructions and phone numbers will be placed in glove box during equipment installation.)
23. Participate in a short phone interview with VTTI about the crash.
24. Schedule an appointment for hearing re-testing, to be conducted **as soon as possible** after the crash. Re-testing is conducted at Professional Hearing Services (6231 Leesburg Pike Suite 512 Falls Church, VA 22044 Phone 703-536-1666). Re-testing results will be provided to you and to VTTI.
25. Encourage all passengers whose hearing has been tested to schedule this re-testing.
26. If the crash is police-reported, request a copy of the Police Accident Report from the police, and provide a copy to VTTI. VTTI will remove all personal identifiers to ensure confidentiality. "Personal identifiers" include names, addresses, phone numbers, and license plate numbers.
27. Request and provide copies of medical report(s) associated with your crash injuries and treatment. For some crashes, crash and injury information may already be available to NHTSA, and thus to this study, in conjunction with other NHTSA-sponsored studies in the Northern Virginia area.
28. Permit VTTI and/or Hurley's to check and test the vehicle instrumentation.

In the event of an air bag deployment:

29. Permit a Special Crash Investigation team from NHTSA to inspect the vehicle.
30. Participate in an in-person interview with the Crash Investigation team.

Equipment de-installation:

VTTI will contact you at the end of the 12-month study, to schedule equipment de-installation and out-processing.

31. Bring your vehicle to Hurley's Auto Audio for equipment de-installation, which will require a full day. We will provide \$10 to cover Metro fare or other transportation needs.
32. Inspect your vehicle at Hurley's and sign form to verify that all recording equipment has been removed, and that the vehicle has been restored to its original state. Keep copy for your records.

Out-processing/study completion (requires one hour):

33. Complete out-processing administrative paperwork.
34. Complete short questionnaires regarding stress levels and driving behavior and

- performance over the past year, and study evaluation.
35. Receive final payment for your participation.

Equipment Installation and Data Collection

You are being asked to drive with the instrumentation for approximately one year. No holes will be drilled into your vehicle to mount equipment. Instead, holes holding existing apparatus will be used. The data collection system is approximately 8" x 18" x 24." The computer/data storage system is housed in the back of the trunk and mounted to the trunk "roof" (not to the trunk lid). A camera module will be mounted above the rear-view mirror and an incident push-button will be located on the camera module. This will be done without drilling holes or making any permanent modifications to the vehicle. Wires will not be visible.

As part of the data collection system, forward- and rearward-looking radar will be installed behind the front and rear license plates. For the radar to function, we will need to replace you state license plate with plastic plates for the duration of the study. You will be provided with a temporary registration and an authorization letter from the state DMV for your records. At the end of the study your original license plates will be reinstalled on the vehicle.

The data on the vehicle will be downloaded via a data port located behind the rear license plate or via short range wireless communication (if there is no access to the vehicle). Once the data is downloaded, it will be stored on a project specific data server that will be accessed only by research staff affiliated with the project.

The data collection system is designed to require no maintenance and will not require you to perform any maintenance. However, if a diagnostic check of the data confirms a disruption of the data collection, a technician will be assigned to correct the problem. To perform the maintenance, VTTI or Hurley's will contact you to receive permission to work on the vehicle and schedule the repair. We will try to avoid interfering with your commuting schedule.

Insurance

Please note that since you are driving your own vehicle, Virginia Tech is not liable for the expenses incurred in any accident you may have. In the event of an accident, you are not responsible for coverage of the instrumentation in the vehicle.

Participants in a study are considered volunteers, regardless of whether they receive payment for their participation. Under Commonwealth of Virginia law, workers compensation does not apply to volunteers; therefore, the participants are responsible for their own medical insurance for bodily injury. Appropriate health insurance is strongly recommended to cover these types of expenses.

If you should become injured in an accident, whether in or out of an automobile, the medical treatment available to you would be that provided to any person by emergency medical services in the vicinity where the accident occurs.

Automatic Collision Notification

The vehicle will also be equipped with an automatic collision notification system, triggered by collision impacts. The system is intended to notify VTTI in the event of a collision impact. When serious impacts are detected by VTTI staff, they will notify local emergency services. *However, VTTI cannot guarantee*

continuous 24-hour coverage or coverage of all vehicle locations. Therefore, in the event of a crash, you should not expect an emergency response based on this system. *Notify police and emergency services as you otherwise would following a crash.* However, this automatic collision notification system *may* enable emergency service to be dispatched to you faster after a crash.

III. RISKS

The risk to you is no more than you would normally incur while driving. All data collection equipment is mounted such that, to the greatest extent possible, it does not pose a hazard in any foreseeable way. None of the data collection equipment will interfere with any part of your normal field of view. The addition of the data collection systems to the vehicle will in no way affect the operating or handling characteristics of the vehicle.

Please note that you are being asked not to wear sunglasses unless absolutely necessary; however, if at any time you are suffering from glare problems (e.g., from the sun shining directly into your face) and cannot see the roadway and your surrounding environment, sunglasses are recommended.

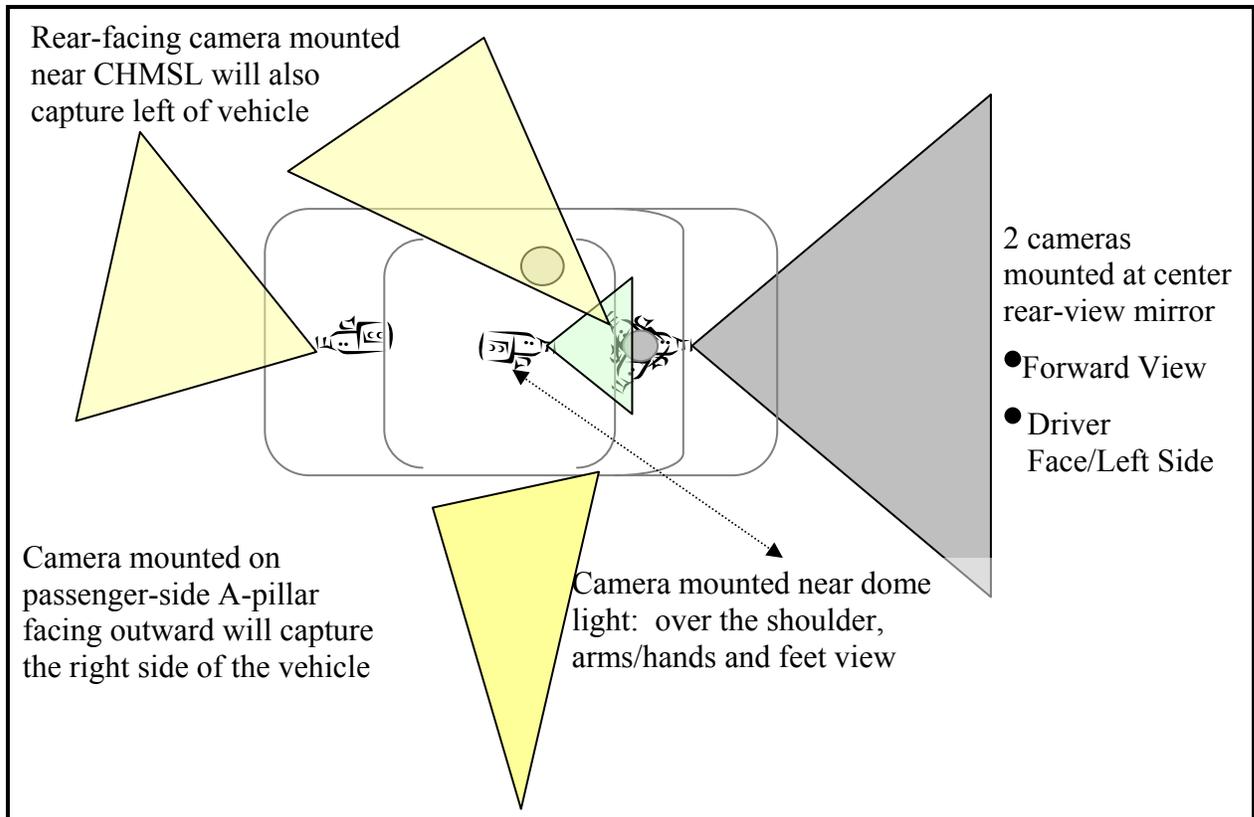
IV. BENEFITS

While there are no direct benefits to you from this research, you may find the experiment interesting. No promise or guarantee of benefits is being made to encourage participation. Your participation will help to improve the body of knowledge regarding driving behavior and performance.

V. EXTENT OF ANONYMITY AND CONFIDENTIALITY

Video information will be taken during the course of data collection. The data gathered in this experiment will be treated with confidentiality. Drivers' names will be separated from the collected data. A coding scheme will be employed to identify the data by subject number only (e.g., Driver No. 3).

While you are driving the vehicle, a camera will record your face and the left exterior side of vehicle, the right exterior side of the vehicle, the forward view, the rear-view, and the instrument panel view. This is shown below. Note that no other passengers in the vehicle will be within the camera view. Also, there is audio recording capability in the vehicle, but it will only record for one minute when you activate the incident push button. Please note that the audio microphone is directional and will only record your voice from the driver's seat.



The data from this study will be stored in a secured area at the Virginia Tech Transportation Institute. Access to the data will be under the supervision of Dr. Tom Dingus, Dr. Vicki Neale, Sheila Klauer, Dr. Ron Knipling, and Heather Foster. Data reductionists assigned to work on this project will also have access to your data. Data reduction will consist of examining driving performance under various conditions. During the course of this study, the video will not be released to anyone other than individuals working on the project without your written consent. Following the study, some data may be made available to the contact sponsor, the National Highway Traffic Safety Administration (NHTSA), for research purposes only. Please note that NHTSA is under the same obligation to keep your data confidential.

If you are involved in a crash while participating in this study, the data collection equipment in your vehicle will likely capture the events leading up to the event. The data collection equipment SHOULD NOT be given to police officers or any other party. You are under NO LEGAL OBLIGATION to mention that you are participating in this study.

We will do everything we can to keep others from learning about your participation in the research. To further help us protect your privacy, the investigators have obtained a Confidentiality Certificate from the Department of Health and Human Services. With this Certificate, the investigators cannot be forced (for example by court subpoena) to disclose information that may identify you in any federal, state, or local civil, criminal, administrative, legislative, or other proceedings. Disclosure will be necessary, however, upon request of DHHS for audit or program evaluation purposes.

You should understand that a Confidentiality Certificate does not prevent you or a member of your family from voluntarily releasing information about yourself or your involvement in this research. Note however, that if an insurer, employer, or someone else learns about your participation, and *obtains your consent* to receive research information, then the investigator may not use the Certificate of Confidentiality to withhold this information. This means that you and your family must also actively protect your own privacy. In addition to the Confidentiality Certificate, we have also obtained approval through the NHTSA Human Use Review Panel for your protection.

Finally, you should understand that the investigator is not prevented from taking steps, including disclosing information to authorities, to prevent serious harm to yourself or others. For example, if we learned about offenses such as child abuse or habitual driving under the influence, we would take appropriate action to protect you and someone else, even though we will still maintain privacy of the data.

VI. COMPENSATION

You will be compensated \$125.00 per month for approximately 12 months of participation in this study. If you choose to withdraw from participation prior to the 12-month period, you will be compensated for the proportion of time that you have participated. You will also receive a \$300 study completion bonus at the end of the 12-month period and equipment de-installation. This bonus will be provided at the out-processing.

In addition to this compensation, you will be given \$10 for travel on the days that instrumentation is installed and removed.

VII. FREEDOM TO WITHDRAW

You are free to withdraw from the study at any time without penalty. If you choose to withdraw, you will be compensated for the portion of the time of the study.

VTTI has the right to terminate your participation in the study at any time. For example, VTTI may withdraw you from the study if the quantity or quality of data is insufficient for study purposes or if you pose a threat to yourself or to others. Subjects withdrawn from the study will receive pro-rated payment (at \$125 per month) and will be required to schedule equipment de-installation as soon as possible.

VIII. APPROVAL OF RESEARCH

This research project has been approved, as required, by the Institutional Review Board for Research Involving Human Subjects at Virginia Polytechnic Institute and State University, by the Virginia Tech Transportation Institute.

IRB Approval Date

Approval Expiration Date

IX. DRIVER'S RESPONSIBILITIES

I voluntarily agree to participate in this study. I understand the procedures and responsibilities described above, in particular in **Section II, Procedures and Subject Responsibilities**.

X. DRIVER'S PERMISSION

I have read and understand the Informed Consent and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent:

Signature of Driver: _____ Date: _____

Signature of Additional Driver:

Date: _____
Signature of Legal Guardian if any additional driver is minors:

Date: _____

Signature of Additional Driver:

Date: _____
Signature of Legal Guardian if any additional driver is minors:

Date: _____

Signature of Additional Driver:

Date: _____

Signature of Legal Guardian if any additional driver is minors:

Date: _____

Should I have any questions about this research or its conduct, I may contact:

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Chair, IRB

Office of Research Compliance

Research & Graduate Studies

All drivers must be given a complete copy (or duplicate original) of the signed Informed Consent.

DOT HS 810 593
April 2006



U.S. Department
of Transportation
**National Highway
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