



2007 Traffic Records Forum

National Motor Vehicle Crash Causation Survey (NMVCCS)

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What is NMVCCS?

- **Nationally representative survey**
- **Using NASS infrastructure**
- **Crashes involving light vehicles**
- **On scene investigation**
- **Associated factors**



Crash Qualification

- EMS dispatch initiated
- On-scene response by NMVCCS researcher
- At least one of 1st three in-transport vehicles on scene
- One of 1st three in-transport vehicles must be a light vehicle towed due to damage
- Police crash report filed with State



Data Sources

- **Interviews**
- **Scene inspection**
- **Vehicle inspection**
- **Official records**



Precrash Assessment Form

- **Critical event**
- **Critical reason for critical event**
- **All factors associated with crash**



Critical Pre-crash Event

- **Action**
 - that made the crash inevitable
 - that put the vehicles on a collision course
- **Crash could not be avoided**
 - normal driving skills
 - vehicle handling properties
- **Not defined by fault or culpability**



Critical Reason

- Immediate reason leading to critical event
- NOT the cause of the crash

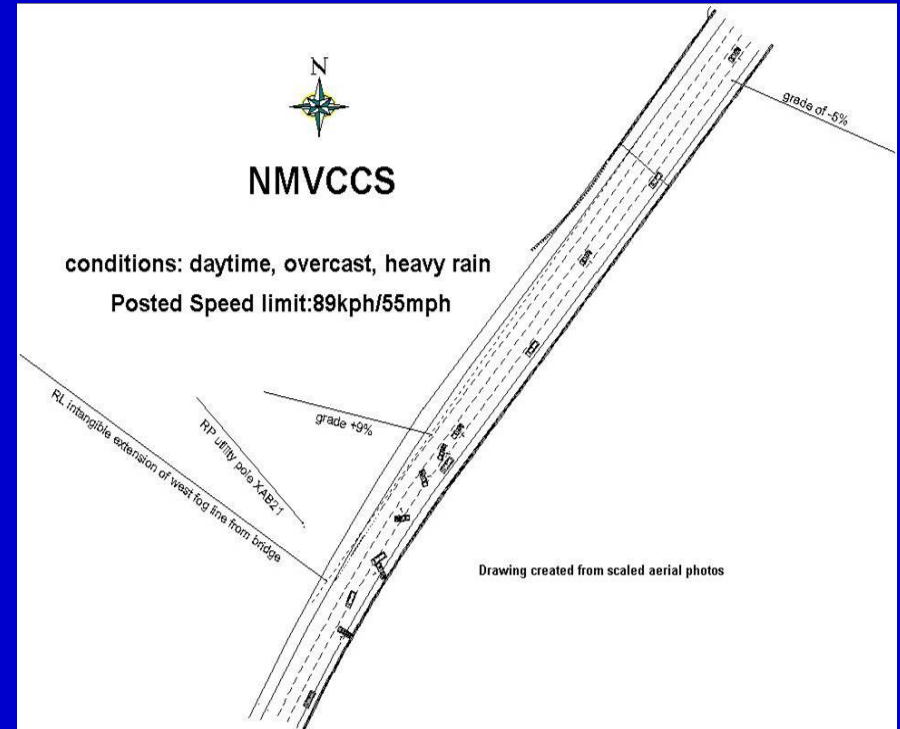


Associated Factors

- **Driver related**
- **Vehicle related**
- **Environment related**

Example Crash One

- Southbound, divided urban highway curving left
- Highway narrowed from four lanes to three
- 5% downgrade 120 meters pre-crash
- 9% uphill grade 35 meters pre-crash

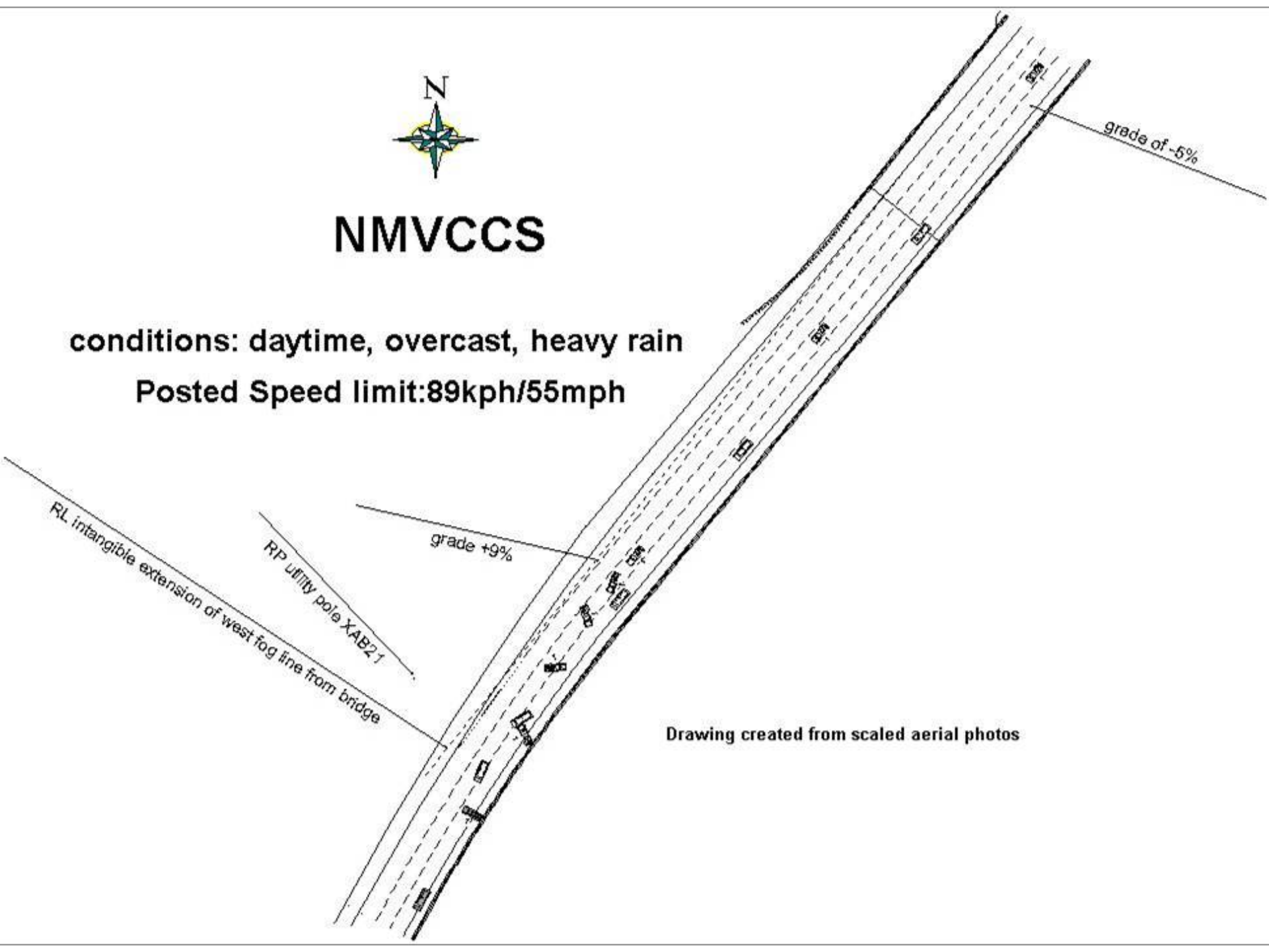




NMVCCS

conditions: daytime, overcast, heavy rain

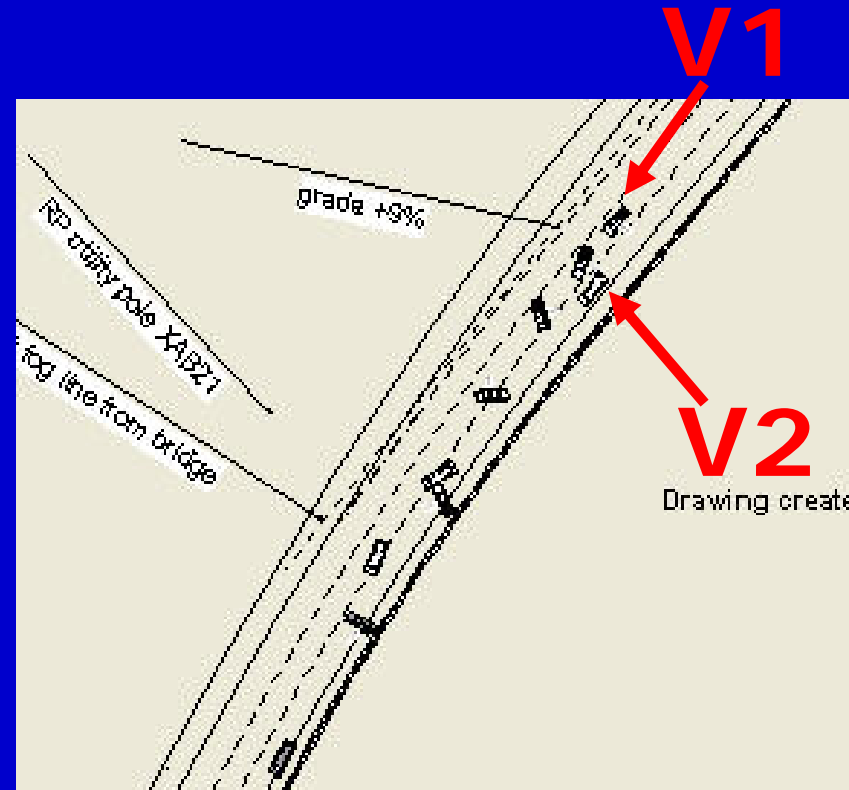
Posted Speed limit: 89kph/55mph



Drawing created from scaled aerial photos

Crash Circumstances

- V1 - 1997 Isuzu Hombre 2 wheel drive
- V2, a 2002 Ford Windstar in left lane
- V1 Attempted to pass V2
- V1 downshifted and tried to accelerate past V2
- V1 lost traction and rotated clockwise
- V1 crossed into left lane in front of V2
- V1 struck the barrier with its rear bumper and bounced back into the travel path of V2





Crash Details

- **V1 was towed due to damage**
 - 26 year old female driver
 - Familiar with this vehicle
 - Drives route daily
 - Attempted to overtake other vehicle
 - Felt vehicle “slip”
 - Refused Medical Treatment

- **V2 was driven from scene**
 - 43 year old female driver
 - 79 year old passenger

Look Back Trajectory



V1 From South



LR Tire

- 1/32 tread
- 28 psi



RR Tire

- 1/32 tread
- 34 psi



RF Tire

- **RF tire**
 - **8/32 tread**
 - **30 psi**

- **LF tire**
 - **8/32 tread**
 - **30 psi**





Vehicle 1

- **Critical Event**
 - “Vehicle control loss due to traveling too fast for conditions”
- **Critical Reason**
 - “Too fast for conditions-heavy rain and water flowing across roadway”
- **Associated factors**
 - Tire/wheel deficiency
 - Rain
 - Wet road surface



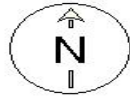
Vehicle 2

- **Critical Event**
 - “Not involved in first harmful event”
- **Critical Reason**
 - “Not coded to this vehicle
- **Associated factors**
 - Driver’s conversation with right front passenger
 - Use of prescription medication
 - Rain
 - Wet roads



Technology

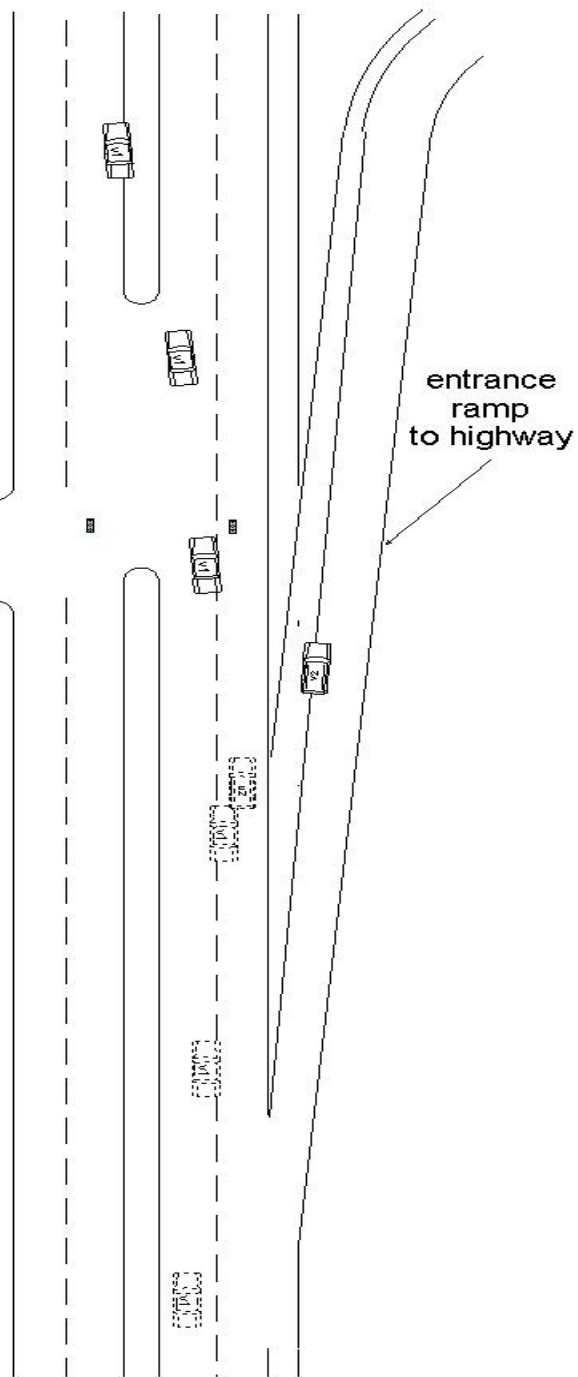
- **Electronic Stability Control**
 - V1 lost control and swerved into barrier
- **Tire Pressure Monitoring Systems**
 - V1 had low pressure in tires
(recommended pressure 35 psi)



45 mph / 72 kmh
concrete, clear, dry


V1: 2002 Ford
Taurus

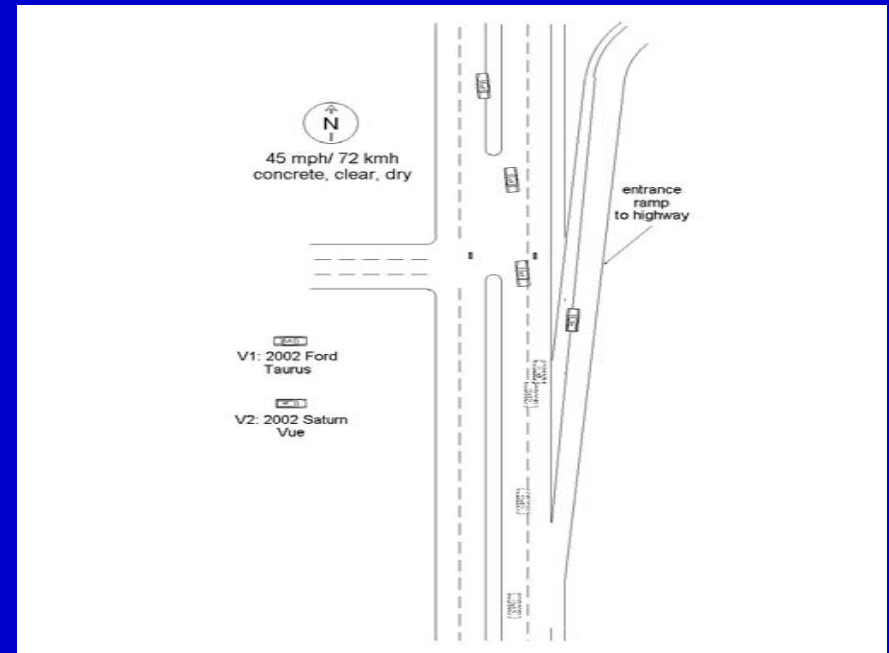

V2: 2002 Saturn
Vue

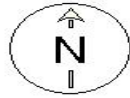


Crash Circumstances

- V1, a 2002 Ford Taurus, northbound in lane 2 approaching intersection

- V2, a 2002 Saturn Vue, stopped facing north at the intersection waiting for signal to change

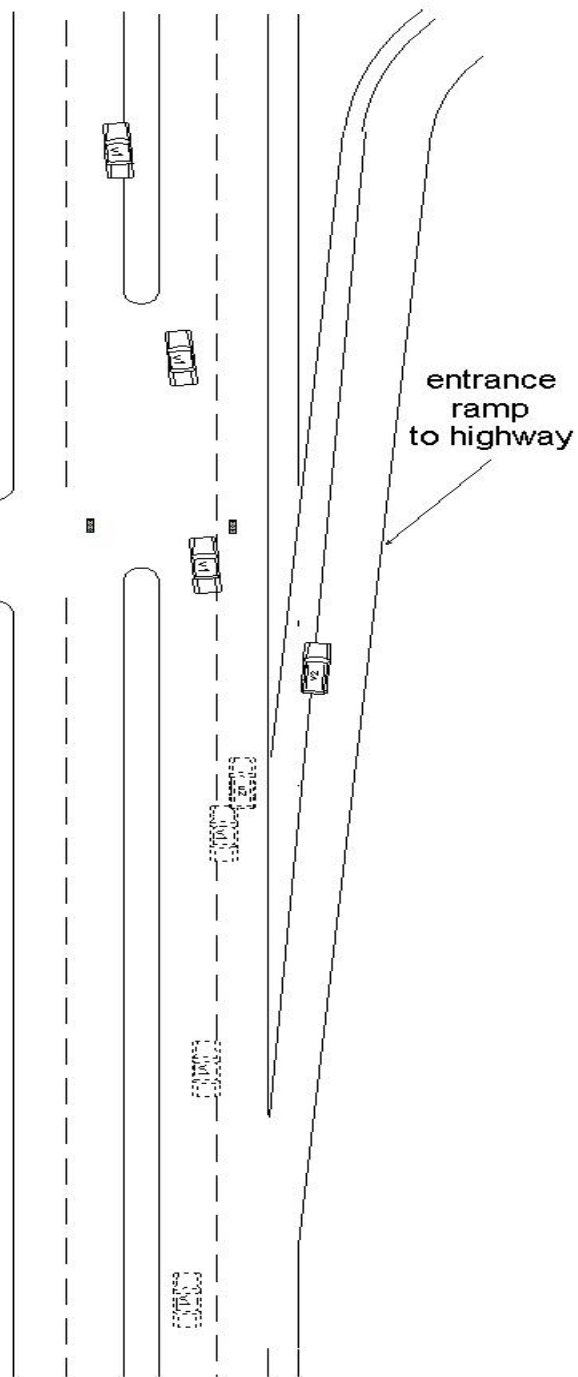




45 mph / 72 kmh
concrete, clear, dry

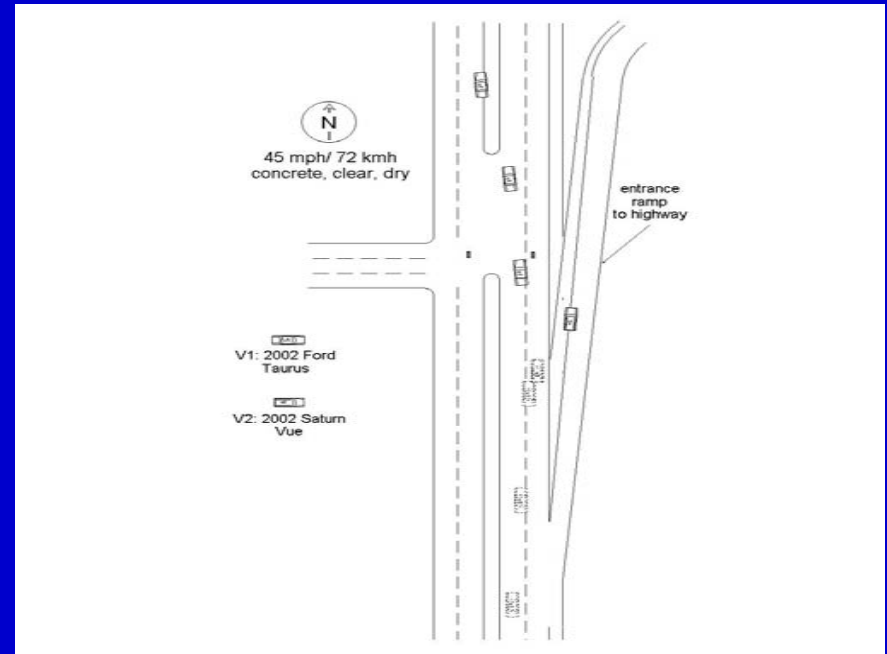

V1: 2002 Ford
Taurus


V2: 2002 Saturn
Vue



Crash Circumstances

- V1 approached intersection, drifted right straddling lanes 1 and 2
- V1 struck the rear of V2 just as light changed and V2 began moving forward
- V1 continued through intersection, striking curbed median, and coming to final rest on curbed median facing north
- V2 came to rest in gore between the roadway and ramp and was towed due to damage



V1 Approach



V1 Approach



V1 Approach



Point of Impact



V1 Final Rest Position



V2 Final Rest Position





V1 Crash Details

- V1 was towed due to damage
- Driver, a 23-year-old female, was returning home after breaking up with her boyfriend
- She admitted to being engaged in an argument with the now ex-boyfriend via a handheld cell phone
- Driver 1 never saw V2 prior to the crash as she was too involved in her argument
- She never slowed down or attempted any evasive actions
- Admitted to only sleeping on average 2-4 hours a night and was fatigued at the time of the crash
- Takes both Prozac and Paxil which have side effects of nervousness, anxiety and drowsiness (alcohol can intensify these effects)
- Tested positive for alcohol (below legal limit-BAC 0.02)



V2 Crash Details

- **V2 was towed due to damage**
- **Driver, a 33-year-old female, was returning home after dining at a local restaurant**
- **She stated that she was stopped at the intersection for about a minute waiting for the signal to change**
- **The light changed and the driver began to slowly accelerate from the stopped position when she was struck on the back left corner from behind**

V1 Right Front Damage



V2 Left Rear Damage





Vehicle 1

- **Critical Event**
 - “Other motor vehicle in lane, traveling in same direction with lower speed”
- **Critical Reason**
 - “Internal Distraction, talking on cell phone”
- **Associated factors**
 - Inattention (focused on personal problem)
 - Talking on a cell phone
 - Inadequate surveillance (failed to look far enough ahead)
 - Emotional distress (the recent break-up)
 - Fatigue
 - Presence of Alcohol mixed with Prozac and Paxil



Vehicle 2

- **Critical Event**
 - “Other motor vehicle in lane, traveling in same direction with higher speed”
- **Critical Reason**
 - “Not coded to this vehicle”
- **Associated factors**
 - **Fatigue from a strenuous training regimen (preparing for a triathlon)**



Technology

- **Lane departure technology**
 - This situation became critical when V1 drifted out of its lane and straddled the lane line between lanes one and two
- **Forward looking radar technology**
 - The driver of V1 also stated that she never saw V2 stopped in front of her



Status of NMVCCS Data

- Response to over 14,000 crashes
- Over 6,000 cases initiated
- Data will be publicly available
 - No personal identifiers on file
- Report to Congress – August 2007

Questions

