Traffic Safety

# Run-Off-Road Collision Avoidance Countermeasures Using IVHS Countermeasures 

TASK 1

## Volume 2: Support Volume

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## Contracting Officer's Technical Representative's Precis

This report provides a basis for disseminating the preliminary contract results on a timely basis resulting in the information being available before the contract final reports are produced. Research performed during the remainder of the contract may support and/or modify the results, therefore, the material contained in this report should not be consider to be final. The current schedule calls for the completion of this research project by the third quarter of 1999.


## INTRODUCTION

This volume contains a summary of data used in the clinical analysis conducted for the Run-Off-Road Collision Avoidance program. The data was extracted from the NASS CDS cases selected for the analysis. All NASS cases were selected form the 1993 NASS CDS data file.

Each case is described by a data summary sheet, which contains descriptive data on the crash, a narrative of what occurred in the crash, a scene diagram illustrating the crash site with the vehicle crash sequence, and a situation tree demonstrating the crash scenario. The descriptive data listed in each case is drawn from the NASS CDS hard copy case report. The narrative for each case was prepared by Calspan analysts. It is a result of the careful consideration by the analyst and takes into account police reports, witness statements (when available) as well as photographs of the scene. The scene diagram is included to allow a better visualization of the crash scene. This diagram goes beyond the scene diagram in the NASS case including details that are apparent to the analyst from photographs of the crash scene.

This volume was assembled to act as a reference for later tasks in this program. Additional detailed questions about the crashes that arise upon selection of a countermeasure technology may be addressed by the data contained in this volume.

| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Opposite Travel Direction |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-6-93 | Weather: | Clear/Cloudy |
| Time: | 1000 | Surface Condition: | Dry |
| Accident Type: | Avoid Collision | Lighting: | Daylight |
| Accident Severity: | 0 (O) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 16 | Year: | 1987 |
| Driver Sex: | Male | Vehicle Make: | Chrysler |
| Impairment: | None | Vehicle Model: | LeBaron |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 06 Stee <br> GV64: 05 Pass <br> GV65: 53 Oth <br> GV66: 1 Trac <br> GV67: 4 Veh | ng left <br> g or overtaking ano motor vehicle in lan ing <br> le departed roadway | posite direction |  |


| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Opposite Travel Direction |

ROADSIDE DEPARTURE: Left

The subject vehicle was traveling in a westerly direction on a dry, straight, level, two-lane, rural, asphalt roadway during daylight hours in an $89 \mathrm{~km} / \mathrm{h}$ ( 55 mph ) speed zone. The subject vehicle was following a non-contact vehicle in the westbound lane and initiated a passing maneuver into the eastbound lane. A second non-contact vehicle exited a parking lot at the south road edge and initiated a left turn into the eastbound travel lane. The subject driver steered left to avoid the left turning vehicle and departed the left road edge. The vehicle traversed the parking lot and impacted several mailboxes and a retaining wall. The road surface was marked with white edge lines and yellow center lines which permitted passing in the westbound direction. All lines were in poor condition. The right (north) shoulder was covered with a frozen snow bank while the left (south) shoulder was plowed, paved, and approximately 2 m wide. There were no roadside reflective markers or delineators.

## ACCIDENT COLLISION DIAGRAM

PSU No. $\underline{2}$ Cose Number - Strotum OO3H


CAUSAL FACTOR: ROADSIDE DEPARTURE:

Driver Relinquishes Steering Control - Intoxicated
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $\begin{aligned} & 2-1-93 \\ & 1838 \\ & \text { Control/Traction Loss } \\ & 0(\mathrm{O}) \end{aligned}$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Snow/Sleet/Hail <br> Ice/Snow <br> None <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 38 <br> Female <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1987 <br> Subaru <br> DL/FE/G/GF/ GLF/STD <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided $2$ | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 99 Unknown <br> GV64: 01 Going straight <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 9 Precrash stability unknown <br> GV67: 9 Directional consequences unknown |  |  |  |

## CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated

## ROADSIDE DEPARTURE: <br> Right

The subject vehicle was traveling in a northerly direction on a two-lane rural road in a $72 \mathrm{~km} / \mathrm{h}(45 \mathrm{mph})$ speed zone. The roadway was snow covered and curved slightly to the left. The driver was intoxicated $(\mathrm{BAC}=0.19)$ and allowed the subject vehicle to drift off the right road edge where it impacted a mailbox and overrode a snowbank before coming to rest on the opposite side of the snowbank. The asphalt roadway was snow-covered and the white edge lines were in poor condition. There were no reflective markers or delineators along the roadside. There were no large scale terrain features or visual obstructions.


Vehicle Dynamic Scenario

CAUSAL FACTOR: Vehicle Speed - Unsafe Driving Act ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 2-3-93 <br> 1430 <br> Control/Traction Loss $1 \text { (C) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Snow/Sleet/Hail <br> Ice/Snow <br> Daylight <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 22 <br> Male <br> None <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1991 <br> Ford <br> Probe <br> Unknown <br> No |
| Roadway information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Flush or curb <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 99 Unknown <br> GV64: 01 Going straight <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 9 Precrash stability unknown <br> GV67: 9 Directional consequences unknown |  |  |  |


| CAUSAL FACTOR: | Vehicle Speed - Unsafe Driving Act |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was traveling in a northerly direction on a curved (left), two-lane, rural roadway during daytime hours. The ambient weather condition was snow and the roadway consisted of snow-covered asphalt with a broken centerline. There were reflective delineators distributed along the roadside. The speed limit was $89 \mathrm{~km} / \mathrm{h}$. The subject driver was traveling at a high rate of speed and allowed the vehicle to exit the right edge of the roadway. The subject vehicle subsequently rolled side-over-side to the right (one complete roll) and came to rest on it's wheels, facing in a southerly direction. The causal factor was vehicle speed, unsafe driving act.


CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-2-93 | Weather: | Clear/Cloudy |
| Time: | 0130 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | None |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 17 | Year: | 1981 |
| Driver Sex: | Male | Vehicle Make: | Ford |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Escort/EXP |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 2 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Unknown | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 99 Unk <br> GV64: 13 Neg <br> GV65: 13 This <br> GV66: 9 Prect <br> GV67: 9 Dir | own <br> tiating a curve <br> vehicle traveling off the <br> ash stability unknown <br> tional consequences unk | oad on the right side |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Vehicle Speed - Speed and Alcohol <br> Right

The subject vehicle was traveling in a northerly direction on a dry, two-lane, rural, asphalt roadway in a $56 \mathrm{~km} / \mathrm{h}(35 \mathrm{mph})$ speed zone. The roadway curved to the left with a $+1 \%$ slope at the apex of the curve. The driver was intoxicated and attempted to negotiate the left curve at an unsafe speed. The vehicle broke traction and yawed in a clockwise direction. The vehicle departed the right road edge and yawed 90 degrees counterclockwise before overturning onto an embankment. (The embankment would have prevented the vehicle from returning to the roadway.) The vertical alignment of the road along the subject vehicle's path of travel began with a slight positive grade followed by a hillcrest transition point at the apex of the curve, and a $-1 \%$ slope at the point of departure. The road was 5.7 m in width with 0.6 m stone shoulders adjacent to both road edges. There were no pavement markings, reflective markers, or delineators along the road edges.
PSU No. 02 Cose Number - Stratum

Vehicle Dynamic Scenario


| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Same Travel Direction |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-6-93 | Weather: | Clear/Cloudy |
| Time: | 1330 | Surface Condition: |  |
| Accident Type: | Avoid Collision | Lighting: | Daylight |
| Accident Severity: | 1 (C) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 33 | Year: | 1992 |
| Driver Sex: | Male | Vehicle Make: | Toyota |
| Impairment: | None | Vehicle Model: | Camry |
| Familiarity with Road: | Unknown | ABS: | Unknown |
| No. of Occupants: | 3 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barricr | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 08 Brak <br> GV64: 01 Goin <br> GV65: 60 Oth <br> GV66: 1 Tra <br> GV67: 4 Veh | ing and steering left <br> straight <br> vehicle encroaching <br> ing <br> le departed roadway | adjacent lane (same direc | n) over left lane line |

## CAUSAL FACTOR: <br> Evasive Maneuver - Vehicle Encroaching into Lane Same Travel Direction <br> ROADSIDE DEPARTURE: Left

The subject vehicle was traveling south on the inboard lane of a dry, four-lane, asphalt interstate divided by a median barrier guardrail and was approaching a construction zone. The road surface had a $-3 \%$ slope to the south and was straight with no superelevation. The driver observed a non-contact vehicle encroaching from the right lane, swerved to the left, and braked with sufficient force to lock the wheels of the vehicle. The vehicle rotated in a counterclockwise direction across the inboard shoulder and grass median and impacted the median barrier guardrail. At impact with the guardrail, the vehicle rotated 90 degrees in a counterclockwise direction. The vehicle continued to rotate counterclockwise and subsequently impacted the barrier with the right rear area. Scene physical evidence consisted of four counterclockwise yaw marks across the shoulder and grass median. The two southbound travel lanes were 3.7 m in width with a 3.2 m wide right shoulder and a 3.8 m inboard paved shoulder. The painted edge lines and broken white lane lines were in good condition. There were reflective delineators located along the outboard edges of both shoulders.

ACCIDENT COLLISION DIAGRAM
PSU No. 02 Case Number Stratum

Vehicle Dynamic Scenario

CAUSAL FACTOR: Driver Relinquishes Steering Control - Fell Asleep

ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-2-93 | Weather: | Clear/Cloudy |
| Time: | 0045 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: |  |
| Accident Severity: | 2 (B) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 67 | Year: | 1986 |
| Driver Sex: | Male | Vehicle Make: | Oldsmobile |
| Impairment: | Fell Asleep | Vehicle Model: | Cutlass |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Flush or curb | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Stee <br> GV64: 01 Goi <br> GV65: 12 This <br> GV66: 4 Skid <br> GV67: 4 Veh | ng right <br> straight <br> vehicle traveling off <br> ing laterally - count <br> le departed roadway | oad on the left side ion |  |

ROADSIDE DEPARTURE:

Driver Relinquishes Steering Control - Fell Asleep
Left

The subject vehicle was traveling on the outboard southbound lane of a dry, level, rural, four-lane, divided, asphalt interstate roadway during nighttime hours. The southbound travel lanes curved slightly to the right and were divided from the northbound lanes by a grass median with a shallow ditch and small diameter trees. The vehicle was traveling at a driver estimated speed of $97-105 \mathrm{~km} / \mathrm{h}(60-65 \mathrm{mph})$ in an $89 \mathrm{~km} / \mathrm{h}(55 \mathrm{mph})$ speed zone. The driver apparently fell asleep and relinquished control of the vehicle. The vehicle drifted across the inboard lane and departed the inboard shoulder onto the grass median. The driver induced rapid steering maneuvers which resulted in a 90 degree counterclockwise yaw onto the median. The vehicle traversed a ditch and overturned. The outboard southbound travel lane was 3.7 m in width and the inboard lane was 3.8 m wide. The outboard (right) shoulder was paved and was with the travel lane, and was 3.3 m wide. The inboard (left) shoulder was flush, was paved, and was 1.6 m in width. Located outboard of both shoulders were reflective delineators which were approximately 30 m apart. The roadway and all pavement markings (edge lines and lane lines) were in good condition.
PSU No. 02


CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Vehicle Speed - Attempted to Initiate a 90 Degree Turn
Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $7-2-93$ <br> 1240 <br> Control/Traction Loss $2 \text { (B) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Wet <br> Daylight <br> Rural |
| Driver/Occup | nt Information | Vehicle Info | mation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 47 <br> Male <br> None <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1983 <br> Cadillac <br> DeVille/ <br> Fleetwood <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 02 Braking (no lockup) <br> GV64: 13 Negotiating a curve <br> GV65: 12 This vehicle traveling off the edge of the road on the left side <br> GV66: 1 Tracking <br> GV67: 4 Vehicle departed roadway |  |  |  |

CAUSAL FACTOR:
Vehicle Speed - Attempted to Initiate a 90 Degree Turn
ROADSIDE DEPARTURE: Left

The subject vehicle was traveling in a southerly direction on a wet, rural, two-lane, asphalt roadway with a $-2 \%$ slope on an approach to a 90 degree right curve. The posted speed limit was $56 \mathrm{~km} / \mathrm{h}(35 \mathrm{mph})$. There were no shoulders, pavement markings, or reflective reflectors/ delineators in the area of the scene. Both edges of the road were bordered by W-beam guardrails that extended across a small bridge. The vehicle approached the right curve at a police reported unsafe speed. The driver braked (no lock-up) on the approach to the curve, however, the vehicle broke traction and the driver backed-off the brake application. The driver again applied a braking force and the vehicle yawed slightly in a clockwise direction and departed the left road edge. The left frontal area of the vehicle impacted the W -beam guardrail. There was a 3 m left front tire mark across the loose stones at the left edge of the road immediately prior to the impact.

## ACCIDENT COLLISION DIAGRAM



## Vehicle Dynamic Scenario



CAUSAL FACTOR: Vehicle Speed-Unsafe Driving Act
ROADSIDE DEPARTURE:

Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-2-93 | Weather: | Rain |
| Time: | 2000 | Surface Condition: | Wet |
| Accident Type: | Control/Traction Loss | Lighting: | None |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 20 | Year: | 1977 |
| Driver Sex: | Male | Vehicle Make: | Toyota |
| Impairment: | None | Vehicle Model: | Pickup |
| Familiarity with Road: <br> No. of Occupants: | Unknown | ABS: | No |
|  | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 08 Bra <br> GV64: 13 Neg <br> GV65: 13 Thi <br> GV66: 2 Ski <br> GV67: 4 Veh | ing and steering left <br> iating a curve vehicle traveling off the ing longitudinally - less le departed roadway | oad on the right side rees rotation |  |

CAUSAL FACTOR: Vehicle Speed - Unsafe Driving Act
ROADSIDE DEPARTURE: ..... Right

The subject vehicle was traveling in a westerly direction on a wet, rural, two-lane, asphalt roadway during dark, unlighted conditions. The roadway curved left with a reported $-2 \%$ slope, straightened for approximately 15 m , and then began to curve to the right. The driver exited the left curve and lost control due to unsafe speed on the wet road and departed the right road edge. The center frontal area of the vehicle impacted a 0.3 m diameter tree which resulted in a $43 \mathrm{~km} / \mathrm{h}$ ( 27 mph ) change in velocity. Scene evidence indicated braking with lockup prior to the crash. There were 7.9 m of skid marks that extended on the asphalt and wet grass surfaces. The road surface was 6.7 m in width with no shoulders on either side. White edge lines marked both road edges, but there were no center lines. There were no reflective markers or delineators at the road edge. The speed limit was $48 \mathrm{~km} / \mathrm{h}(30 \mathrm{mph})$. The PAR noted speed as a contributing factor to the crash.
PSU No. $\underline{02}$

Vehicle Dynamic Scenario

CAUSAL FACTOR: Evasive Maneuver - Vehicle Encroaching into Lane - Same Travel Direction
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | $\begin{aligned} & 8-1-93 \\ & 0835 \end{aligned}$ <br> Avoid Collision $2 \text { (B) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Daylight <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 58 <br> Male <br> None <br> Unknown <br> 3 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1992 <br> Ford <br> Unknown (automobile) <br> Unknown <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Physical barrier <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Steering right <br> GV64: 01 Going straight <br> GV65: 60 Other vehicle encroaching into lane from adjacent lane (same direction) over left lane line <br> GV66: 1 Tracking <br> GV67: 4 Vehicle departed roadway |  |  |  |

CAUSAL FACTOR:

ROADSIDE DEPARTURE:

## Evasive Maneuver - Vehicle Encroaching into Lane Same Travel Direction

Right

The subject vehicle was proceeding on a left curve segment of a dry, four-lane, divided, interstate roadway during daylight hours. The roadway consisted of two lanes in each direction that were divided by a W-beam guardrail median barrier. The subject vehicle was traveling on the outboard northbound lane when a non-contact vehicle initiated a lane change maneuver from the left lane into the right outboard lane. The subject driver steered onto the right shoulder to avoid the encroaching vehicle. The subject vehicle departed the shoulder and impacted an embankment with the right front side area of the vehicle. The northbound travel lanes were each 3.8 m in width, with a 3.8 m outboard shoulder, and a 2.9 m wide left shoulder. Both shoulders were paved and were flush with the travel lanes. The road edges were marked with solid edge lines that were in new condition, while the lane lines were white broken lines that were also in new condition. There were reflective delineators outboard of the shoulders along each side of the northbound lanes.


Vehicle Dynamic Scenario

Controlled /
$\qquad$ Resolution ——
Roadway
Departure
Side Impact Roadway
Crash

```
CAUSAL FACTOR: Driver Relinquishes Steering Control - Fell Asleep
ROADSIDE DEPARTURE: Left
```

|  | General Accident Information |  |  |
| :--- | :--- | :--- | :--- |
| Date: | $8-1-93$ | Weather: | Fog |
| Time: | 0625 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Daylight |
| Accident Severity: | 1 (C) | Land Use: | Rural |

CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Driver Relinquishes Steering Control - Fell Asleep
Left

The subject vehicle was traveling in a northerly direction on a foggy, dry, rural, four-lane, divided, asphalt interstate during the early morning daylight hours. The roadway curved slightly to the right and was level with paved shoulders adjacent to each road edge. A W-beam median barrier guardrail was located 5.5 m west of the inboard road edge line. A ditch paralleled the outboard shoulder approximately 6 m out. The vehicle was traveling on the inboard lane at a driver estimated speed of $101-105 \mathrm{~km} / \mathrm{h}(63-65 \mathrm{mph})$ in a posted $89 \mathrm{~km} / \mathrm{h}(55 \mathrm{mph})$ speed zone. The driver fell asleep and as a result, the vehicle drifted off the left road edge. The vehicle impacted a reflective delineator post with the center frontal area. The driver subsequently initiated a clockwise steering input as the left side of the vehicle sideswiped the W-beam median barrier guardrail. The vehicle yawed in a clockwise direction and reentered the roadway crossing both travel lanes before departing the right shoulder. The left side of the vehicle impacted the ditch before coming to rest adjacent to the ditch. The edge lines were painted and were in good condition. Reflective delineators were set at 30 m intervals along the outboard edges of both shoulders. There were no reflective markers on the pavement. There were no other terrain features or obstacles.



| CAUSAL FACTOR: | Vehicle Speed-Excessive |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 8-3-93 | Weather: | Clear/Cloudy |
| Time: | 1430 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 0 (O) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 46 | Year: | 1985 |
| Driver Sex: | Female | Vehicle Make: | Lincoln |
| Impairment: | None | Vehicle Model: | Unknown (automobile) |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 04 Braking (lockup unknown) |  |  |  |
| GV64: 01 Going straight |  |  |  |
| GV65: 50 Other motor vehicle in lane, stopped |  |  |  |
| GV66: 4 Skidding laterally - counterclockwise rotation |  |  |  |
| GV67: 4 Vehicle departed roadway |  |  |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Vehicle Speed - Excessive <br> Left

The subject vehicle was traveling in a northerly direction on the inboard lane of a dry, straight, four-lane, divided, asphalt interstate with an estimated $-1.5 \%$ slope and posted speed limit of $89 \mathrm{~km} / \mathrm{h}(55 \mathrm{mph})$. The driver was traveling at a police reported unsafe speed and noted stopped traffic ahead due to a previous accident. The driver braked and the vehicle subsequently skidded off the left (inboard) road edge onto the grass median and impacted a W-beam median barrier guardrail. Both shoulders were paved and reflective delineators were present on the outboard sides of the shoulders.

# ACCIDENT COLLISION DIAGRAM 

NOT AVAILABLE AT THE

TIME OF THIS PRINTING


| CAUSAL FACTOR: | Vehicle Speed - Unsafe Driving Act |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | $\begin{aligned} & 2-1-93 \\ & 2335 \end{aligned}$ <br> Control/Traction Loss $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy Ice/Snow Artificial lighting Urban |
| Driver/Occup | nt Information | Vehicle Info | mation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 22 <br> Male <br> None <br> Unknown | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1979 <br> Ford <br> Mustang/ <br> Mustang II <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Physical barrier <br> 3 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 01 Goi <br> GV65: 05 This <br> GV66: 1 Tra <br> GV67: 1 Veh | oidance actions <br> straight <br> ehicle loss of control du ing <br> le stayed in travel lane w | conditions <br> nce maneuver was initia |  |

# CAUSAL FACTOR: ROADSIDE DEPARTURE: <br> Vehicle Speed - Unsafe Driving Act <br> Left 

The subject vehicle was traveling in a westerly direction on an icy, urban, six-lane, divided, asphalt roadway approaching a four-leg intersection that was controlled by a traffic signal. The driver estimated the vehicle's speed at $16-24 \mathrm{~km} / \mathrm{h}(10-15 \mathrm{mph})$ as it traversed the intersection. The vehicle broke traction on the icy road surface, yawed in a counterclockwise direction, and departed the left (inboard) road edge. The left frontal area of the vehicle impacted a bridge support pillar. The estimated maximum crush was 72 cm . There was no measured crush profile. The causal factor was driver traveling at an unsafe speed for the icy road conditions.

## ACCIDENT COLLISION DIAGRAM

PSU No. 03


| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Same Travel Direction |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 3-2-93 <br> 1457 <br> Control/Traction Loss $3(\Lambda)$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Daylight <br> Urban |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 35 <br> Female <br> None <br> Unknown <br> 2 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1983 <br> Chevrolet <br> G-series van <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Physical barrier <br> 3 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 08 Braking and steering left <br> GV64: 01 Going straight <br> GV65: 51 Other motor vehicle in lane traveling in same direction with lower speed <br> GV66: 1 Tracking <br> GV67: 4 Vehicle departed roadway |  |  |  |



The subject vehicle was traveling in the center lane of an urban, straight, level, six-lane, divided, asphalt expressway during daylight hours at a driver estimated speed of $72 \mathrm{~km} / \mathrm{h}$ ( 45 mph ). A non-contact lead vehicle stopped suddenly in the center lane. The subject driver braked and steered left to avoid the non-contact vehicle. The subject vehicle yawed in a counterclockwise direction and departed the left (inboard) shoulder and impacted the W-beam median barrier guardrail. The causal factor was reported as an evasive action to avoid the stopped vehicle.


## Vehicle Dynamic Scenario



| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Same Travel Direction |
| ROADSIDE DEPARTURE: | Right |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 8-3-93 | Weather: | Rain |
| Time: | 0745 | Surface Condition: | Wet |
| Accident Type: | Avoid Collision | Lighting: | Daylight |
| Accident Severity: | 1 (C) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 28 | Year: | 1987 |
| Driver Sex: | Male | Vehicle Make: | Toyota |
| Impairment: | None | Vehicle Model: | Camry |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 09 Bra <br> GV64: 01 Go <br> GV65: 60 Oth <br> GV66: 1 Track <br> GV67: 4 Veh | ng and steering rig straight vehicle encroachin ing <br> le departed roadwa | adjacent lane (same dire | n) over left lane line |

# CAUSAL FACTOR: 

ROADSIDE DEPARTURE: Right

The subject vehicle was traveling in the first westbound travel lane of an urban, four-lane, divided, asphalt roadway (five lanes with exit ramp) during daylight and raining conditions. The roadway had a negative slope and curved to the left. The driver stated that a non-contact truck traveling in the second westbound lane passed the vehicle and then pulled into the first westbound lane, cutting off the subject vehicle. The subject driver apparently steered to the right to avoid contact with the truck traveling in the same direction. The subject vehicle exited the roadway to the right and struck the terminal end of a Fitch energy absorbing barrier treatment located in the gore area between the travel lanes and exit ramp.
14. HIGH CONCRETE WALL ENTIRE LENGTH


Vehicle Dynamic Scenario


CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Evasive Maneuver - Avoid Animal or Pedestrian
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-6-93 | Weather: | Clear/Cloudy |
| Time: | 7003 | Surface Condition: | Wet |
| Accident Type: | Avoid Collision | Lighting: | Daylight |
| Accident Severity: | 2 (B) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 56 | Year: | 1990 |
| Driver Sex: | Female | Vehicle Make: | Acura |
| Impairment: | None | Vehicle Model: | Integra |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Flush or curb | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $80 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 09 Braking and steering right |  |  |  |
| GV64: 01 Going straight |  |  |  |
| GV65: 87 Animal in roadway |  |  |  |
| GV66: 1 Tracking |  |  |  |
| GV67: 4 Vehicle departed roadway |  |  |  |

## CAUSAL FACTOR: Evasive Maneuver - Avoid Animal or Pedestrian <br> ROADSIDE DEPARTURE: Right

The subject vehicle was traveling in the outboard lane of a wet, straight, level, divided, asphalt roadway. The driver was traveling at an estimated speed of $72 \mathrm{~km} / \mathrm{h}$ ( 45 mph ) approaching a left curve. Prior to the curve, the driver swerved to avoid striking a dead animal in the travel lane. The vehicle broke traction on the wet road surface and yawed in a clockwise direction. The vehicle mounted the right barrier curb and traversed a grassy lawn area as it continued to rotate in a clockwise direction. The left side of the vehicle impacted a parked vehicle at an auto dealer's lot. Evasive action to avoid an animal was the primary causal factor.



| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Same Travel Direction |
| ROADSIDE DEPARTURE: | Left |



| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Same Travel Direction |
| ROADSIDE DEPARTURE: | Left |

The subject vehicle was initiating a left turn from a jug handle onto a divided roadway at a signalized intersection. As the driver accelerated in the center of three lanes, a non-contact vehicle ran the red signal phase and encroached into the subject vehicle's path of travel. The subject driver steered in a counterclockwise direction to avoid the non-contact vehicle and departed the inboard road edge. The subject vehicle impacted and drove over a 20 cm high barrier curb before coming to rest on the grass median. The causal factor was evasive action to avoid impact with an encroaching vehicle that was traveling in the same westerly direction.
PSU No. 04

## Vehicle Dynamic Scenario



CAUSAL FACTOR: Driver Inattention
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-1-93 | Weather: | Clear/Cloudy |
| Time: | 1629 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 0 (O) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 44 | Year: | 1991 |
| Driver Sex: | Female | Vehicle Make: | Chevrolet |
| Impairment: | None | Vehicle Model: | Cavalier |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 99 Unknown |  |  |  |
| GV64: 01 Going straight |  |  |  |
| GV65: 09 This vehicle loss of control due |  |  |  |
| GV66: 9 Precrash stability unknown |  |  |  |
| GV67: 9 Directional consequences unknown |  |  |  |

CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Driver Inattention
Right

The subject vehicle was traveling in a southeasterly direction on a straight and level asphalt road surface during daylight hours. The driver was inattentive and allowed the vehicle to drift to the right and depart the right curb line. The vehicle drove over the barrier curb and impacted a chain-link fence. The vehicle penetrated the fence and came to rest against a building. There were multiple roadside obstacles adjacent to each curb line including small diameter trees, utility poles, and a chain-link fence. The posted speed limit was $40 \mathrm{~km} / \mathrm{h}(25 \mathrm{mph})$.

## ACCIDENT COLLISION DIAGRAM

PSU No. 04


CAUSAL FACTOR: Vehicle Speed-Excessive
ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-5-93 | Weather: | Clear/Cloudy |
| Time: | Unknown | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 0 (0) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 27 | Year: | 1989 |
|  | Female | Vehicle Make: | Mazda |
|  | None | Vehicle Model: | 626 |
|  | Unknown | ABS: | No |
|  | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Flush or curb 3 | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Level <br> $80 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 03 Brak <br> GV64: 13 Neg <br> GV65: 06 This <br> GV66: 2 Ski <br> GV67: 4 Veh | ing (lockup) <br> iating a curve <br> vehicle loss of contr <br> ing longitudinally - <br> le departed roadway | g too fast for conditions rees rotation |  |

## CAUSAL FACTOR: Vehicle Speed-Excessive <br> ROADSIDE DEPARTURE: Left

The subject vehicle was traveling in an easterly direction in a divided three-lane roadway that curved sharply to the right. Both edges of the road were bordered by 15 cm barrier curbs. The driver entered the curve at an excessive rate of speed and drifted from the center lane across the left inboard lane. The driver braked with sufficient force to lock the front wheels of the vehicle causing it to skid in a tracking mode across the median and across another intersecting roadway. The vehicle drove over several barrier curbs before coming to rest.

## ACCIDENT COLLISION DIAGRAM




## CAUSAL FACTOR: Driver Relinquishes Steering Control - Physical (seizure/passed out)

ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-2-93 | Weather: | Clear/Cloudy |
| Time: | 1625 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | None |
| Accident Severity: | 2 (B) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 39 | Year: | 1980 |
| Driver Sex: | Male | Vehicle Make: | Pontiac |
| Impairment: | Physical <br> (seizure/passed out) | Vehicle Model: | Sunbird |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
|  | oidance actions <br> straight <br> ehicle loss of control du <br> oidance maneuver <br> oidance maneuver |  |  |


| CAUSAL FACTOR: | Driver Relinquishes Steering Control - Physical <br> (seizure/passed out) |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was traveling in a southwesterly direction on a straight and level two-lane asphalt road when the driver suffered a diabetic seizure. The vehicle drifted off the right road edge in a tracking mode leaving a rotating tire mark on the grass. The center frontal area of the vehicle impacted a large diameter tree resulting in a $24 \mathrm{~km} / \mathrm{h}(15 \mathrm{mph})$ Delta V. The posted speed limit was $56 \mathrm{~km} / \mathrm{h}(35 \mathrm{mph})$. Narrow paved shoulders bordered the travel lanes with grass and trees adjacent to the shoulders. The edge lines and center lines were in poor condition and there were no reflective delineators.

## ACCIDENT COLLISION DIAGRAM



CAUSAL FACTOR: Driver Relinquishes Steering Control - Other ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-4-93 | Weather: | Clear/Cloudy |
| Time: | 0058 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | None |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 17 | Year: | 1991 |
| Driver Sex: | Male | Vehicle Make: | Jeep |
| Impairment: | None | Vehicle Model: | YJ Series |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 4 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $80 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 08 Brak <br> GV64: 01 Goin <br> GV65: 08 This <br> GV66: 2 Skid <br> GV67: 4 Veh | g and steering left <br> straight <br> vehicle loss of control du <br> ing longitudinally - less <br> le departed roadway | rees rotation |  |

CAUSAL FACTOR: Driver Relinquishes Steering Control - Other
ROADSIDE DEPARTURE: ..... Left

The subject vehicle was traveling in a westerly direction on a dry, six-lane, divided, asphalt roadway in a $80 \mathrm{~km} / \mathrm{h}(50 \mathrm{mph})$ speed zone. The vehicle was traveling in the center westbound lane at a driver estimated speed of $56 \mathrm{~km} / \mathrm{h}(35 \mathrm{mph})$. The right rear occupant reached forward and hit the driver in the eye which caused the driver to lose control of the vehicle. The vehicle yawed in a counterclockwise direction across the paved shoulder of the inboard travel lane. The left front area of the vehicle impacted a concrete jersey median barrier. The vehicle was redirected in a clockwise direction and traveled along the inboard shoulder, contacting the barrier again before coming to rest, facing west. The road surface was clearly marked with broken white lane lines and solid painted edge lines. There were no reflective roadside delineators or markers.



## CAUSAL FACTOR: Vehicle Failure

ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | $\begin{aligned} & 8-6-93 \\ & 1341 \end{aligned}$ <br> Control/Traction Loss $0(\mathrm{O})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear <br> Dry <br> Daylight <br> Urban |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 17 <br> Female <br> None <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1987 <br> Ford <br> Escort/EXP <br> No <br> Engine Stall |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Flush or curb <br> 4 | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $32 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 13 Negotiating a curve <br> GV65: 02 This vehicle loss of control due to stalled engine <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Vehicle Failure <br> Left

The subject driver was attempting to negotiate a right curve on a four-lane, one-way road that separated into a Y-configuration. As the vehicle approached the junction, the engine stalled and the driver was unable to steer the vehicle through the curve. The vehicle impacted the barrier curb at the island area with the right front tire and skidded to a stop on the grassy surface. There was no evidence of pre-impact braking, however, the driver braked during or after the impact. The asphalt road surface was dry and open and afforded the driver a clear line of sight. All road markings were in good condition and there were no roadside reflective markers/delineators.
PSU No. O 4 COse Number - Stratum


| CAUSAL FACTOR: | Evasive Maneuver - Avoid Animal or Pedestrian |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 8-2-93 <br> 2341 <br> Avoid Collision <br> 2 (B) | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Artificial lighting <br> Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 27 <br> Male <br> None <br> Unknown <br> 3 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1988 <br> Pontiac <br> Firebird/ <br> Trans Am <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $64 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 03 Braking (lockup) <br> GV64: 01 Going straight <br> GV65: 87 Animal in roadway <br> GV66: 2 Skidding longitudinally - less than 30 degrees rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |

## CAUSAL FACTOR: ROADSIDE DEPARTURE:

The subject vehicle was traveling on an dry, straight, level, urban, asphalt roadway that decreased from four lanes to two lanes in a $64 \mathrm{~km} / \mathrm{h}(40 \mathrm{mph})$ speed zone. The road was dark but lighted and the driver was traveling within the speed limit when a small animal entered the travel lane. The driver swerved to the right and braked in an attempt to avoid the animal. The vehicle skidded in a tracking orientation off the right road edge and the right frontal area of the vehicle impacted a large diameter tree. Approximately 17 m of right front skid marks and 8 m of left front skid marks were documented. The vehicle was traveling at $63.3 \mathrm{~km} / \mathrm{h}(39.3 \mathrm{mph})$, based on a calculated Delta V of $17 \mathrm{~km} / \mathrm{h}(11 \mathrm{mph})$ and measured skid distance. Both edges of the roadway were bordered by large diameter trees which limited the driver's escape routes. The solid white edge lines and the double yellow center lines were in good condition, however, there were no reflective markers or delineators.
CSU No. $\underline{04}$ Cose Number - Strotum 127 F


Controlled /
Uncontrolled - Long. Skid Movement

Controlled /
Uncontrolled - Long. Skid
Movement

Roadway
Departure
Crash Frontal Impact

CAUSAL FACTOR: Lost Directional Control
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 2-7-93 <br> 1037 <br> Control/Traction Loss $2 \text { (B) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Snow/Sleet/Hail <br> Ice/Snow <br> Daylight <br> Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 32 <br> Female <br> None <br> Unknown <br> 4 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1984 <br> Chevrolet <br> Celebrity <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 5 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Steering right <br> GV64: 01 Going straight <br> GV65: 05 This vehicle loss of control due to poor road conditions <br> GV66: 3 Skidding laterally - clockwise rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Lost Directional Control <br> Right

The subject vehicle was traveling in the outboard lane of a snow- and ice-covered, straight, level, five-lane undivided, asphalt roadway at a driver estimated speed of $32-48 \mathrm{~km} / \mathrm{h}$ ( $20-30 \mathrm{mph}$ ). The driver lost control of the vehicle when it overrode the ice which initiated a clockwise yaw. The vehicle departed the right road edge in a near broadside orientation and impacted a utility pole with the left front fender area.
CSU No. 05 Cose Number - Strotum


## CAUSAL FACTOR: Vehicle Speed - Unsafe Driving Act ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 2-1-93 | Weather: | Snow/Sleet/Hail |
| Time: | 1610 | Surface Condition: | Ice/Snow |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 0 (0) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 48 | Year: | 1985 |
| Driver Sex: | Male | Vehicle Make: | Ford |
| Impairment: | None | Vehicle Model: | Tempo |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 2 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 01 Goi <br> GV65: 05 This <br> GV66: 0 No <br> GV67: 0 No | oidance actions <br> straight <br> vehicle loss of control du <br> oidance maneuver <br> oidance maneuver | ad conditions |  |

## CAUSAL FACTOR: Vehicle Speed - Unsafe Driving Act ROADSIDE DEPARTURE: Left

The subject vehicle was traveling in a southerly direction on a snow-covered, two-lane asphalt roadway that curved slightly to the left with an estimated $+2 \%$ slope. The driver estimated the vehicle's travel speed at $72 \mathrm{~km} / \mathrm{h}(45 \mathrm{mph})$. The vehicle broke traction on the icy surface and rotated in a counterclockwise direction. The vehicle departed the left road edge and impacted a speed limit sign with the right front side area. The vehicle continued in a broadside orientation onto an intersecting street where it came to rest. The causal factor was an unsafe driving act with excessive speed on a snow-covered road surface.

## ACCIDENT COLLISION DIAGRAM

PSU No. O5 Cose Number - Strotum

Vehicle Dynamic Scenario


| CAUSAL FACTOR: | Vehicle Speed - Excessive |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 3-5-93 | Weather: | Clear/Cloudy |
| Time: | 2058 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | None |
| Accident Severity: | 1 (C) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 19 | Year: | 1990 |
| Driver Sex: | Male | Vehicle Make: | Ford |
| Impairment: | None | Vehicle Model: | Taurus |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 3 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Level <br> $64 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 03 Braking (lockup) |  |  |  |
| GV64: 13 Negotiating a curve |  |  |  |
| GV65: 12 This vehicle traveling off the |  | oad on the left side |  |
| GV66: 22 Skidding longitudinally - less |  | rees rctation |  |
| GV67: 4 Vehicle departed roadway |  |  |  |

```
CAUSAL FACTOR: Vehicle Speed-Excessive
ROADSIDE DEPARTURE: Left
```

The subject vehicle was traveling in westerly direction on a two-lane, rural roadway on an approach to a moderate right curve. The driver attempted to negotiate the curve at an unsafe speed and drifted across the center line. The driver subsequently braked with sufficient force to lock the left front wheel of the vehicle. The vehicle skidded off the left road edge and impacted an earth embankment with the frontal area of the vehicle. There was a positive-sloped earth embankment adjacent to the left shoulder. The area outboard of the right road edge was level.
PSU No. 05 Cose Number - Stratum O3SE

Vehicle Dynamic Scenario


CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-7-93 | Weather: | Clear/Cloudy |
| Time: | 0045 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | None |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: Driver Sex: | 41 | Year: | 1986 |
|  | Male | Vehicle Make: | Buick |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Somerset/ Skylark |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: |  |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 99 Unkn <br> GV64: 13 Nego <br> GV65: 13 This <br> GV66: 9 Precr <br> GV67: 9 Direc | wn <br> iating a curve <br> ehicle traveling off the <br> sh stability unknown <br> ional consequences unk | oad on the right side |  |

CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Driver Relinquishes Steering Control - Intoxicated
Right

The subject vehicle was traveling in a westerly direction on a dry two-lane, rural, asphalt roadway in a $56 \mathrm{~km} / \mathrm{h}$ ( 35 mph ) speed zone. The road curved to the right and had a $+2.5 \%$ slope. The driver failed to negotiate the right curve and departed the right road edge in a tracking mode. The vehicle traversed a grassy shoulder and sideswiped a wooden utility pole with the right side area. The vehicle subsequently yawed in a clockwise direction as it contacted a shallow ditch and earth embankment. As a result, the vehicle overturned onto its roof. The driver was intoxicated with a BAC of 0.22 . The surface was marked with solid white edge lines and double yellow center lines.


Vehicle Dynamic Scenario


```
CAUSAL FACTOR: Vehicle Failure
ROADSIDE DEPARTURE: Right
```

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-5-93 | Weather: | Clear/Cloudy |
| Time: | 1815 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 1 (C) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 41 | Year: | 1990 |
| Driver Sex: | Female | Vehicle Make: | Toyota |
| Impairment: | None | Vehicle Model: | Corolla |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | Tire Blowout |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 03 Bra <br> GV64: 01 Goi <br> GV65: 01 Thi <br> GV66: 2 Ski <br> GV67: 4 Veh | ing (lockup) <br> straight <br> vehicle loss of control du <br> ding longitudinally - less <br> cle departed roadway | ar or flat tire rees rotation |  |

CAUSAL FACTOR:
ROADSIDE DEPARTURE:

## Vehicle Failure

Right

The subject vehicle was westbound on an urban, two-lane asphalt roadway during daylight hours. The road surface was dry and straight with an estimated $+1.5 \%$ slope. The driver was traveling at $56 \mathrm{~km} / \mathrm{h}(35 \mathrm{mph})$ when the left front tire failed. The vehicle yawed in a clockwise direction and departed the right road edge. The vehicle impacted a stone wall at the mouth of a private driveway and overturned, coming to rest on a second wall that was located on the opposite side of the driveway. Both edges were marked with solid white lines and the center was marked with double yellow center lines. There were no shoulders adjacent to the road edges. The primary causal factor was a vehicle related failure, left front tire blowout.


## Vehicle Dynamic Scenario



## CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 8-4-93 | Weather: | Clear/Cloudy |
| Time: | 0305 | Surface Condition: |  |
| Accident Type: | Control/Traction Loss | Lighting: | Artificial lighting |
| Accident Severity | 0 (O) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 50 | Year: | 1990 |
| Driver Sex: | Male | Vehicle Make: | Mazda |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | MPV |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 06 Ste <br> GV64: 10 Tur <br> GV65: 13 Thi <br> GV66: 1 Tra <br> GV67: 4 Ve | ing left <br> g left <br> vehicle traveling off the ing <br> le departed roadway | oad on the right side |  |

# CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol <br> ROADSIDE DEPARTURE: 

The subject vehicle was traveling in a northerly direction on a two-lane roadway on an approach to a 3-leg T-intersection. Traffic flow through the intersection was controlled by an overhead signal system. The driver initiated a left turn through the intersection on a green signal phase at an unsafe speed and drove off the right edge of the intersecting roadway. The frontal area of the vehicle impacted a wooden utility pole that was located 0.6 m outboard of the road edge. The driver was intoxicated (BAC unknown).


Vehicle Dynamic Scenario


```
CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Left
```

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 3-4-93 | Weather: | Rain |
| Time: | 2330 | Surface Condition: | Wet |
| Accident Type: | Control/Traction Loss | Lighting: | Artificial lighting |
| Accident Severity: | 1 (C) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 19 | Year: | 1980 |
| Driver Sex: | Male | Vehicle Make: | Chevrolet |
| Impairment: | Other (alcoh. consumption <br> - BAC .06) | Vehicle Model: | Camaro |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Steering right |  |  |  |
| GV64: 13 Negotiating a curve |  |  |  |
| GV65: 12 This vehicle traveling off the edge |  | oad on the left side |  |
| GV66: 1 Tracking |  |  |  |
| GV67: 4 Vehicle departed roadway |  |  |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Left

The subject vehicle was traveling in a southerly direction on a level, four-lane, urban roadway that contained two sets of railroad tracks within the inboard travel lanes. The driver had a BAC of 0.06 and entered a moderate right curve at an excessive speed. The driver allowed the vehicle to drift across the center line while attempting to negotiate the curve. The vehicle continued across the opposing travel lanes and departed the left road edge. The left frontal area of the vehicle impacted and fractured a wooden utility pole that was located approximately 0.6 m outboard of the road edge.


Vehicle Dynamic Scenario


CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Lost Directional Control
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $\begin{aligned} & 1-5-93 \\ & 0937 \end{aligned}$ <br> Control/Traction Loss $0(\mathrm{O})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Snow/Sleet/Hail <br> Ice/Snow <br> Daylight <br> Rural |
| Driver/Occup | nt Information | Vehicle Info | mation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 22 <br> Male <br> None <br> Yes | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1989 <br> Ford <br> Explorer <br> Yes <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 09 Braking and steering right <br> GV64: 13 Negotiating a curve <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 7 Other vehicle loss-of-control <br> GV67: 4 Vehicle departed roadway |  |  |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Lost Directional Control <br> Right

The subject vehicle was traveling through sleet and freezing rain in a southeasterly direction on an icy, two-lane, undivided, asphalt roadway with a long downhill grade. As the driver entered a left curve at an estimate speed of $40 \mathrm{~km} / \mathrm{h}(25 \mathrm{mph})$, the vehicle drifted across the center line. The driver applied a clockwise steering input and pumped the brakes as the road switched to the right curve of a lazy S-curve configuration. The vehicle departed the right road edge in a slight counterclockwise yaw and impacted a utility pole that was approximately 1.5 m outboard of the road edge.


## Vehicle Dynamic Scenario



Controlled /


CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Vehicle Speed - Excessive
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-3-93 | Weather: | Clear/Cloudy |
| Time: | 1742 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 0 (0) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 16 | Year: | 1975 |
| Driver Sex: | Male | Vehicle Make: | Ford |
| Impairment: | None | Vehicle Model: | Mustang/ <br> Mustang II |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 06 Stee <br> GV64: 13 Neg <br> GV65: 06 This <br> GV66: 1 Trac <br> GV67: 4 Veh | ng left <br> iating a curve <br> vehicle loss of control du <br> ing <br> le departed roadway | g too fast for conditions |  |

CAUSAL FACTOR: Vehicle Speed - Excessive
ROADSIDE DEPARTURE: Right

The subject vehicle was traveling in a westerly direction on a two-lane road in a posted $56 \mathrm{~km} / \mathrm{h}(35 \mathrm{mph})$ speed zone. The driver attempted to negotiate a moderate left curve at an unsafe speed. The vehicle drifted off the right road edge and impacted the end of a W-beam guardrail system that paralleled the right road edge. The vehicle ramped up the guardrail and overturned onto the asphalt road surface. The left edge of the roadway was bordered by a steep embankment.

## ACCIDENT COLLISION DIAGRAM



## Vehicle Dynamic Scenario



CAUSAL FACTOR: $\quad$| Driver Relinquishes Steering Control - Physical |
| :--- |
| (seizure/passed out) |

ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 2-3-93 | Weather: | Snow/Sleet/Hail |
| Time: |  | Surface Condition: |  |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 80 | Year: | 1989 |
| Driver Sex: | Male | Vehicle Make: | Oldsmobile |
| Impairment: | Physical (seizure/passed out) | Vehicle Model: | Ninety-Eight |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 13 Neg <br> GV65: 08 This <br> GV66: 0 No <br> GV67: 0 No | oidance actions <br> iating a curve <br> vehicle loss of control du <br> oidance maneuver <br> oidance maneuver |  |  |

CAUSAL FACTOR: $\quad$| Driver Relinquishes Steering Control - Physical |
| :--- |
| (seizure/passed out) |

ROADSIDE DEPARTURE: Right

The subject vehicle was traveling during daylight hours in a northerly direction on the outboard lane of a four-lane roadway with a $-2 \%$ slope. The driver passed out while attempting to negotiate a moderate left curve. The vehicle departed the right road edge and mounted a barrier and traveled along a concrete sidewalk that paralleled the roadway. The frontal area of the vehicle impacted a utility pole that was located several feet outboard of the curb line. The vehicle rotated approximately 120 degrees in a clockwise direction before coming to rest across the northbound travel lanes. The negative slope afforded the driver good visibility.
PSU No. O Cose Number - Strotum O25J Indicate North


CAUSAL FACTOR:
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-1-93 | Weather: | Clear/Cloudy |
| Time: | 0511 | Surface Condition: |  |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 2 (B) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 36 | Year: | 1981 |
| Driver Sex: | Male | Vehicle Make: | Plymouth |
| Impairment: | Other (alcoh. consumption <br> - BAC unknown) | Vehicle Model: | Horizon |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Flush or curb | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 09 Tur <br> GV65: 13 This <br> GV66: 0 No <br> GV67: 0 No | voidance actions <br> ing right <br> vehicle traveling off the edge <br> voidance maneuver <br> voidance maneuver | oad on the right side |  |


| CAUSAL FACTOR: | Driver Inattention |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was proceeding in a southerly direction on a dry, two-lane, urban, asphalt roadway at dawn. The roadway curved slightly to the right, was bounded by 2.5 cm curbs, and had a $+11 \%$ slope. The driver was inattentive to the driving task and attempted to light a cigarette, allowing the vehicle to drift off the right edge of the roadway. The right front corner area of the vehicle struck a utility pole. The vehicle rotated approximately 45 degrees around the pole in a clockwise direction and came to rest in contact with the pole.
PSU No. 08 Cose Number - Stratum

## Vehicle Dynamic Scenario



CAUSAL FACTOR: ROADSIDE DEPARTURE:

Driver Inattention
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 7-6-93 <br> 2227 <br> Drive Off Road $0(\mathrm{O})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Artificial lighting <br> Urban |
| Driver/Occup | nt Information | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 40 <br> Female <br> None <br> Unknown <br> 3 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1989 <br> Dodge <br> Caravan <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Flush or curb <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

## CAUSAL FACTOR:

Driver Inattention
ROADSIDE DEPARTURE: Right

The subject vehicle was traveling in an easterly direction on a dry, two-lane, divided, asphalt roadway that channeled to an undivided roadway at the mouth of a 3-leg T-intersection. The vehicle was traveling at an estimated speed of $40 \mathrm{~km} / \mathrm{h}(25 \mathrm{mph})$ on the approach toward the intersection. The driver was inattentive and allowed the vehicle to drift to the right and depart the southeast corner of the intersection. The right front tire mounted the barrier curb and the right frontal area of the vehicle impacted a utility pole. The vehicle rotated in a clockwise direction and overturned. The road had solid white edge lines and barrier curbs outboard of the edge line. There were no shoulders on either side of the road.
PSU No. $\underline{08}$ Cose Number - Strotum


CAUSAL FACTOR: Vehicle Speed-Excessive
ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-7-93 | Weather: | Clear/Cloudy |
| Time: | 0350 | Surface Condition: |  |
| Accident Type: | Control/Traction Loss | Lighting: | Artificial lighting |
| Accident Severity: | 0 (O) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | Unknown | Year: | 1990 |
| Driver Sex: | Male | Vehicle Make: | Mitsubishi |
| Impairment: | Unknown | Vehicle Model: | Eclipse |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Ste <br> GV64: 13 Neg <br> GV65: 06 Thi <br> GV66: 3 Ski <br> GV67: 4 Veh | ing right <br> iating a curve <br> vehicle loss of control du <br> ing laterally - clockwise <br> le departed roadway | g too fast for conditions |  |

```
CAUSAL FACTOR: Vehicle Speed - Excessive
ROADSIDE DEPARTURE: Left
```

The subject vehicle was traveling on a one-lane concrete ramp with a positive slope that curved moderately to the right. As the driver attempted to negotiate the curve, the vehicle apparently yawed in a clockwise direction and departed the left road edge. The vehicle ramped up onto a curbed median and subsequently overturned. Roadway edge lines were faint. Excessive speed was the causal factor based on the travel distance of the vehicle during the rollover sequence.

ACCIDENT COLLISION DIAGRAM
PSU No. O8 Cose Number - Strotum

## Vehicle Dynamic Scenario



| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-7-93 | Weather: | Clear/Cloudy |
| Time: | 0150 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | None |
| Accident Severity: | 0 (O) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 28 | Year: | 1984 |
| Driver Sex: | Male | Vehicle Make: | Audi |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | 5000 |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Flush or curb | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 13 Neg <br> GV65: 13 This <br> GV66: 0 No <br> GV67: 0 No | oidance actions iating a curve ehicle traveling off the oidance maneuver oidance maneuver | rad on the right side |  |

# CAUSAL FACTOR: ROADSIDE DEPARTURE: <br> Right <br> <br> \section*{Driver Relinquishes Steering Control - Intoxicated} 

 <br> <br> \section*{Driver Relinquishes Steering Control - Intoxicated}}

The subject vehicle was traveling at night in a westerly direction in the outboard lane of an unlighted, dry, level, four-lane, divided, concrete interstate that curved to the right with a slight superelevation. Police reported the vehicle's speed at $89 \mathrm{~km} / \mathrm{h}(55 \mathrm{mph}$ ). The driver was intoxicated ( $\mathrm{BAC}=0.27$ ) and relinquished control of the vehicle. As a result, the vehicle drifted across the right outboard road edge and the driver braked or steered in an attempt to regain control. Tire marks were left on the paved shoulder before the vehicle impacted a concrete barrier which protected a high concrete retaining wall. The barrier redirected the vehicle across the westbound travel lanes and across the median before it came to rest diagonal to the eastbound travel lanes.


Roadway
Departure

## CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated ROADSIDE DEPARTURE:

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-3-93 | Weather: | Clear/Cloudy |
| Time: | 2204 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | Artificial lighting |
| Accident Severity: | 0 (O) | Land Use: | Urban |
| Driver/Occupant information |  | Vehicle Information |  |
| Driver Age: | 37 | Year: | 1989 |
| Driver Sex: | Male | Vehicle Make: | Chevrolet |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Cavalier |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: |  | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided <br> 3 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 13 Neg <br> GV65: 13 This <br> GV66: 0 No <br> GV67: 0 No | oidance actions tiating a curve vehicle traveling off the oidance maneuver oidance maneuver | road on the right side |  |


| CAUSAL FACTOR: | Driver Relinquishes Steering Control - Intoxicated |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was traveling in the outboard lane of a dry, three-lane, undivided, asphalt roadway that curved left with a $+5 \%$ slope. Both edges of the roadway were bordered by barricr curbs and a grass embankment paralleled the west edge. The driver was intoxicated ( $\mathrm{BAC}=0.17$ ) and failed to negotiate the left curve. The vehicle departed the right road edge, sideswiped a utility pole, and traversed a grassy area. The vehicle continued for approximately 35 m across the grass before crossing an intersecting street and coming to rest at a traffic island.



CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Driver Relinquishes Steering Control - Intoxicated
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 8-1-93 | Weather: | Clear/Cloudy |
| Time: | 0425 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Artificial lighting |
| Accident Severity: | 2 (B) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 33 | Year: | 1989 |
| Driver Sex: | Female | Vehicle Make: | Nissan/Datsun |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Pulsar |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: |  | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 01 Goi <br> GV65: 13 This <br> GV66: 0 No <br> GV67: 0 No | oidance actions <br> straight <br> vehicle traveling off oidance maneuver <br> oidance maneuver | oad on the right side |  |

CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Driver Relinquishes Steering Control - Intoxicated
Right

The subject vehicle was traveling after dark in the outboard lane of a lighted, straight, three-lane, urban, asphalt roadway with a $+7.5 \%$ slope in a $40 \mathrm{~km} / \mathrm{h}(25 \mathrm{mph})$ speed zone. Both edges of the road were bordered by barrier curbs with numerous trees, poles, and signs placed along the curb, approximately 0.3 m off the road. As the driver ascended the grade, the vehicle drifted to the right and mounted the barrier curb. The right frontal area impacted a small diameter tree resulting in a change in velocity of $35 \mathrm{~km} / \mathrm{h}(22 \mathrm{mph})$. The vehicle rotated 12 degrees in a clockwise direction and came to rest against the struck tree. The driver was intoxicated (BAC unknown).
PSU No. 08 Cose Number - Strotum


| CAUSAL FACTOR: | Vehicle Speed - Speed and Alcohol |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $\begin{aligned} & 1-1-93 \\ & 0235 \end{aligned}$ <br> Drive Off Road $3(\mathrm{~A})$ | Weather: <br> Surface Condition: Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> None <br> Urban |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 20 <br> Male <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1989 <br> Ford <br> F-series pickup <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Flush or curb <br> 4 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $80 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Right

The subject vehicle was traveling east on a straight, six-lane, divided, highway when the driver departed the right edge of the road as the result of being under the influence of alcohol and driving at a high rate of speed. The driver locked the brakes in an attempt to avoid striking a utility pole located on the grassy area adjacent to the asphalt shoulder. The pole sheared at the base and the vehicle rotated in counterclockwise direction before coming to rest heading in a northerly direction. The causal factor was vehicle speed and alcohol consumption.

ACCIDENT COLLISION DIAGRAM
PSU No. 09 Cose Number - Strotum

## Vehicle Dynamic Scenario



| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-1-93 | Weather: | Clear/Cloudy |
| Time: | 0220 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 19 | Year: | 1984 |
| Driver Sex: | Female | Vehicle Make: | Ford |
| Impairment: | Fell Asleep | Vehicle Model: | Tempo |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: |  | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $80 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No a <br> GV64: 01 Goin <br> GV65: 13 This <br> GV66: 0 No a <br> GV67: 0 No a | oidance actions <br> straight <br> vehicle traveling off oidance maneuver voidance maneuver | oad on the right side |  |


#### Abstract

CAUSAL FACTOR: ROADSIDE DEPARTURE:

Driver Relinquishes Steering Control - Fell Asleep Right

The subject vehicle drifted off the right road edge of a dry, straight, two-lane, undivided, asphalt roadway with $\mathrm{a}+2 \%$ slope. The roadway was dark and not illuminated by street lights. The vehicle traveled 36 m along the grassy shoulder before striking a tree with its frontal plane. The driver fell asleep prior to the roadway departure. The causal factor was that the driver fell asleep and relinquished control of the vehicle.




## Vehicle Dynamic Scenario



CAUSAL FACTOR:
ROADSIDE DEPARTURE:
Driver Inattention
Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 2-1-93 | Weather: | Clear/Cloudy |
| Time: | 0720 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 31 | Year: | 1982 |
| Driver Sex: | Male | Vehicle Make: | Plymouth |
| Impairment: | None | Vehicle Model: | Gran Fury |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $64 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14:  99 <br> GV64:  13 <br> GVeg   <br> GV65: 12 Thi <br> GV66: 9 Pre <br> GV67: 9 Dir | own <br> tiating a curve vehicle traveling of ash stability unknow tional consequence | oad on the left side |  |

# CAUSAL FACTOR: ROADSIDE DEPARTURE: Driver Inattention <br> Left 

The subject vehicle was traveling westbound in the left lane during daylight on a dry, four-lane, divided, asphalt roadway that curved to the left. The driver was inattentive to the driving task and drifted off the left roadway edge. The vehicle traveled approximately 20 m along the 2.5 m wide median grassy shoulder prior to striking a tree with the vehicle's left side plane. The vehicle continued along the shoulder and struck three additional trees. The driver did not apply the brakes prior to the final impact. There were no sight line restrictions or roadway obstructions. The causal factor was that the driver was inattentive to the driving task and drifted off the left side of the roadway.


## Vehicle Dynamic Scenario



Roadway
$\begin{gathered}\text { Departure } \\ \text { Crash }\end{gathered}$ $\begin{aligned} & \text { Side Impact/ } \\ & \text { Frontal Impact }\end{aligned}$
Return to $\qquad$ Roadway

Resolution $\qquad$

CAUSAL FACTOR: Driver Inattention
ROADSIDE DEPARTURE: Left


CAUSAL FACTOR:

Driver Inattention
ROADSIDE DEPARTURE: Left

The subject vehicle was traveling during daylight hours on a dry, straight, level, four-lane, divided, asphalt roadway when the driver became inattentive to the driving task and drifted off the inboard road edge. The vehicle traveled approximately 20 m on the 1.3 m wide asphalt shoulder before impacting a W-beam guardrail. The vehicle returned to the travel lanes and departed the right roadway edge line striking another guardrail. The vehicle separated from this guardrail and came to rest on the shoulder next to the guardrail. There were no adverse weather conditions and no sight line restrictions. The causal factor was driver inattention.



CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-6-93 | Weather: | Clear/Cloudy |
| Time: | 0008 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 25 | Year: | 1993 |
| Driver Sex: | Male | Vehicle Make: | Ford |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Mustang/ <br> Mustang II |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: |  |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 13 Neg <br> GV65: 13 This <br> GV66: 0 No <br> GV67: 0 No | oidance actions iating a curve vehicle traveling off oidance maneuver oidance maneuver | oad on the right side |  |

CAUSAL FACTOR: Driver Relinquishes Steering Control-Intoxicated
ROADSIDE DEPARTURE: Right

The subject vehicle was traveling in an easterly direction on a dry, two-lane, asphalt roadway during nighttime hours. The driver was intoxicated ( $\mathrm{BAC}=0.29$ ) and attempted to negotiate a moderate left curve at an unknown, but reasonable rate of speed. The vehicle drifted off the right road edge in a tracking mode and impacted a W -beam guardrail in a right sideswipe configuration. The guardrail redirected the vehicle across the roadway where it impacted a bridge rail. There was no edge line in the area of the initial road departure and no reflective markers or delineators.

## ACCIDENT COLLISION DIAGRAM



Vehicle Dynamic Scenario


CAUSAL FACTOR: ROADSIDE DEPARTURE:

Driver Relinquishes Steering Control - Intoxicated
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-6-93 | Weather: | Clear/Cloudy |
| Time: | 0205 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 4 (K) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 23 | Year: | 1988 |
| Driver Sex: | Male | Vehicle Make: | Buick |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Regal |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: |  | Defects: |  |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Level <br> 89 km/h |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 13 Neg <br> GV65: 11 Thi <br> GV66: 0 No <br> GV67: 0 No | oidance actions tiating a curve vehicle traveling ov oidance maneuver oidance maneuver | right side of travel lane |  |

# CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated 

## ROADSIDE DEPARTURE:

The subject vehicle was westbound on a level, six-lane, divided, concrete roadway which curved left. The roadway was dark with no artificial illumination. The driver had consumed alcohol and was swerving from lane to lane, traveling at a high rate of speed. The vehicle drifted off the right side of the roadway and struck a guardrail. The vehicle was redirected onto the roadway, where it crossed the three travel lanes and struck a bridge support post in the median. The driver did not apply brakes prior to the guardrail impact. The right roadway edge was striped with a solid white edge line which was in good condition. A rumble strip was present on the shoulder adjacent to the roadway edge line. The causal factor was excessive vehicle speed in combination with alcohol consumption.

ACCIDENT COLLISION DIAGRAM



```
CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Right
```

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 1-7-93 <br> 1845 <br> Drive Off Road $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> None <br> Rural |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 47 <br> Male <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1978 <br> Buick <br> LeSabre <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Physical barrier <br> 4 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 14 Changing lanes <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

```
CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Right
```

The subject vehicle was traveling eastbound in the left lane of a dry, level, unlit, superelevated, four-lane divided asphalt roadway that curved left. The driver swerved to the right departing the right roadway edge line and then counter-steered to the left. The vehicle subsequently rotated counterclockwise and re-entered the travel lanes striking the concrete median barrier with the frontal plane. The driver was intoxicated with a 0.2 BAC . The causal factor was roadway departure due to driver intoxication.

Vehicle Dynamic Scenario


| CAUSAL FACTOR: | Vehicle Speed - Other |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 2-3-93 | Weather: | Snow/Sleet/Hail |
| Time: | 0650 | Surface Condition: | Wet |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 0 (O) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 27 | Year: | 1991 |
| Driver Sex: | Female | Vehicle Make: | Chevrolet |
| Impairment: | None | Vehicle Model: | Geo Tracker |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Level <br> $105 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 06 Steering left |  |  |  |
| GV64: 13 Negotiating a curve |  |  |  |
| GV65: 05 This vehicle loss of control due to poor road conditions |  |  |  |
| GV66: 4 Skidding laterally - counterclockwise rotation |  |  |  |
| GV67: 4 Vehicle departed roadway |  |  |  |

```
CAUSAL FACTOR: Vehicle Speed - Other
ROADSIDE DEPARTURE: Left
```

The subject vehicle was traveling at dawn on a wet (snowing), four-lane, divided, concrete interstate roadway that curved to the right. The driver was traveling too fast for conditions in the right lane and lost control. The vehicle rotated counterclockwise and departed the left roadside. The vehicle continued onto the grass median and rolled over. The driver, after attempting to counter-steer when initially losing control, let go of the steering wheel, relinquishing control of the vehicle. The causal factor was speed to fast for conditions.

ACCIDENT COLLISION DIAGRAM
PSU No. 11 Case Number - Stratum O45G


CAUSAL FACTOR: Vehicle Speed-Excessive
ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 2-7-93 | Weather: | Clear/Cloudy |
| Time: | 0313 | Surface Condition: | Ice/Snow |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 20 | Year: | 1986 |
| Driver Sex: | Male | Vehicle Make: | Ford |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Escort/EXP |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 5 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 03 Brak <br> GV64: 13 Neg <br> GV65: 05 This <br> GV66: 3 Skid <br> GV67: 4 Veh | gg (lockup) <br> iating a curve <br> vehicle loss of contro <br> ing laterally - clock <br> le departed roadway | ad conditions |  |

```
CAUSAL FACTOR: Vehicle Speed - Excessive
ROADSIDE DEPARTURE: Left
```

The subject vehicle was traveling east in a right curve section of an icy, rural, two-lane, dirt roadway with a $-6.5 \%$ slope. The driver lost directional control. The vehicle departed the left side of the roadway and struck trees with its left side plane. The roadside afforded minimal lateral recovery distance due to the drop off beyond the shoulder which was approximately 1 m wide. The driver had been drinking which contributed to the crash. The causal factor was a combination of the vehicle traveling too fast for conditions and alcohol consumption.



CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-6-93 | Weather: | Clear/Cloudy |
| Time: | 1650 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Daylight |
| Accident Severity: | 4 (K) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 47 | Year: | 1984 |
| Driver Sex: | Female | Vehicle Make: | Lincoln |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Continental/ <br> Town Car |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $80 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 01 Goi <br> GV65: 13 This <br> GV66: 0 No <br> GV67: 0 No | oidance actions <br> straight <br> vehicle traveling off <br> oidance maneuver <br> oidance maneuver | oad on the right side |  |

## CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol <br> ROADSIDE DEPARTURE: Right

The subject vehicle was traveling in an easterly direction on a dry, straight, level, rural, two-lane, asphalt roadway. The vehicle drifted off the right road edge in a tracking mode, impacted a mailbox post, and continued traveling along the right road edge for 90 m until the center frontal area impacted a large diameter tree. The roadway's solid white edge lines and broken yellow center line were in poor condition. The speed limit of the roadway was $80 \mathrm{~km} / \mathrm{h}$ ( 50 mph ). The Delta V was computed at $121 \mathrm{~km} / \mathrm{h}(75 \mathrm{mph})$. The driver was intoxicated ( $\mathrm{BAC}=0.20$ ) and, according to witnesses, swerving from lane to lane.



CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-5-93 | Weather: | Rain |
| Time: | 1550 | Surface Condition: | Wet |
| Accident Type: | Drive Off Road | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 62 | Year: | 1989 |
| Driver Sex: | Male | Vehicle Make: | Chevrolet |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Baretta/Corsica |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: |  | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions |  |  |  |
| GV64: 01 Going straight |  |  |  |
| GV65: 12 This vehicle traveling off the edge of the road on the left side |  |  |  |
| GV66: $\quad 0 \quad$ No avoidance maneuver |  |  |  |
| GV67: 0 No avoidance maneuver |  |  |  |

## CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated <br> ROADSIDE DEPARTURE: Left

The subject vehicle was traveling in a southerly direction on a rural two-lane roadway during daylight hours. The road was straight and level but the surface was wet due to rain. The vehicle drifted off the left road edge, traversed a tall grassy area, and traveled up a shallow embankment at the side of a private driveway. The vehicle vaulted the driveway and overturned onto a large rock before coming to rest against a tree. The roadway had white edge lines and a broken yellow center line. The driver was highly intoxicated ( $\mathrm{BAC}=0.33$ ) and allowed the vehicle to gradually depart the left road edge.


Vehicle Dynamic Scenario


CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 7-7-93 <br> 0017 <br> Drive Off Road $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> None <br> Rural |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 20 <br> Male <br> Intoxicated (alcohol/drugs) <br> Unknown | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1988 <br> Toyota <br> Pickup <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 13 Negotiating a curve <br> GV65: 06 This vehicle loss of control due to traveling too fast for conditions <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Vehicle Speed - Speed and Alcohol <br> Right

The subject vehicle was traveling west on a dry, dark and unlit, two-lane, undivided, asphalt roadway with $a+3 \%$ slope. The roadway segment curved to the left. The subject vehicle departed the right roadway edge, traveled across a grassy lawn, crossed a private gravel driveway, struck a 0.6 m high raised sidewalk/wall, and came to rest on the lawn beyond the sidewalk. The roadway was delineated by full barrier yellow center lines which were in good condition and a white roadway edge line along the departure side which was extremely worn and rated in poor condition. There were no off-road obstacles with the exception of the raised sidewalk to impede vehicle recovery. The driver was intoxicated with a 0.22 BAC and traveling at $113 \mathrm{~km} / \mathrm{h}$ ( 70 mph ). The causal factor was excessive vehicle speed and alcohol consumption.


## Vehicle Dynamic Scenario



Controlled /
Uncontrolled - Tracking Movement

Roadway
Return to

Roadway | Roadway |
| :---: |
| Departure |
| Crash |

CAUSAL FACTOR: Evasive Maneuver - Vehicle Encroaching into Lane Same Travel Direction

ROADSIDE DEPARTURE:
Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-4-93 | Weather: | Clear/Cloudy |
| Time: | 1335 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 4 (K) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 22 | Year: | 1987 |
| Driver Sex: | Male | Vehicle Make: | Mercury |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Topaz |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: |  |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 06 Stee <br> GV64: 13 Neg <br> GV65: 52 Oth <br> GV66: 1 Tra <br> GV67: 4 Veh | ing left iating a curve motor vehicle in lane tr ing <br> le departed roadway | me direction with higher | peed |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Evasive Maneuver - Vehicle Encroaching into Lane Same Travel Direction <br> Left

The subject vehicle was traveling eastbound in the left lane of a dry, level, four-lane, divided, asphalt interstate highway during daylight hours. As the driver approached a two-lane entrance ramp junction, the driver became engaged in a confrontation with another motorist traveling in the right lane. The subject driver crossed the left roadway edge line and traveled on the 1 m wide paved median shoulder before veering to the right in an attempt to avoid the concrete median barrier. The vehicle re-entered the eastbound travel lanes, rotated in a clockwise direction across three lanes, departed the right roadway edge, crossed the adjacent paved median/gore area, crossed the two entrance ramp lanes, departed the right side of the adjacent grass area and subsequently rolled over.

ACCIDENT COLLISION DIAGRAM



| CAUSAL FACTOR: | Driver Relinquishes Steering Control - Other |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |



CAUSAL FACTOR: Driver Relinquishes Steering Control - Other
ROADSIDE DEPARTURE:

The subject vehicle was traveling eastbound on a dry, five-lane, asphalt roadway which curved to the left with a $-2 \%$ slope. The vehicle departed the right side of the roadway, mounted a 10 cm high barrier curb, crossed a grassy area and struck two trees with the left side and frontal planes. The driver had consumed alcohol and illicit drugs prior to the accident, and had apparently fallen asleep and drifted off the roadway. The roadway was dark with illumination provided by overhead street lights. The roadway edge was noted only by a barrier curb without a supplemental painted road edge line. The two eastbound lanes were defined by broken white lane lines. The center of the roadway was marked with solid yellow and broken lines to define the boundaries of a two way, left turn channelization lane. The causal factor for the accident was driver relinquished steering control after falling asleep. Contributing factors were the consumption of alcohol and other illicit drugs.
PSU No. 11


CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Driver Inattention
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-2-93 | Weather: | Clear/Cloudy |
| Time: | 0920 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 33 | Year: | 1988 |
| Driver Sex: | Female | Vehicle Make: | Mazda |
| Impairment: | None | Vehicle Model: | MX-6 |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 2 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 02 Slow <br> GV65: 13 This <br> GV66: 0 No <br> GV67: 0 No | oidance actions ng or stopping in tr vehicle traveling of oidance maneuver oidance maneuver | oad on the right side |  |

CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Driver Inattention
Right

This subject vehicle was traveling east on a dry, rural, two-lane, undivided, asphalt roadway with a $-2 \%$ slope. The vehicle drifted off the right side of the roadway, crossed the 0.3 m gravel shoulder, traveled along a negative-sloped grass embankment, sideswiped a tree with its right side, and struck another tree with its frontal plane. The driver was distracted when a pet dog sitting in the right front seat became ill and the driver reached in the rear seat for paper towels. The roadway was marked with a new broken/solid yellow center line (i.e., passing allowed for eastbound traffic), however, there were no road edge lines on either side of the roadway. The roadway boundary included a 0.3 m gravel shoulder followed by a negative-sloped embankment and a tree line barrier located 3.4 m laterally from the roadway edge. The causal factor was driver inattentive to the driving task (steered off roadway while retrieving an object from the rear seat).
PSU No. 11 Cose Number - Strotum

Vehicle Dynamic Scenario
Roadway
Return to
Roadway $\qquad$ Resolution
Departure
Crash
Side Impact/ Frontal Impact

| CAUSAL FACTOR: | Evasive Maneuver - Avoid Animal or Pedestrian |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-4-93 | Weather: | Clear/Cloudy |
| Time: | 0252 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 2 (B) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 38 | Year: | 1992 |
|  | Male | Vehicle Make: | Chevrolet |
|  | Intoxicated (alcohol/drugs) | Vehicle Model: | C, K, R, V-series |
|  | Unknown | ABS: | Yes |
|  | $1$ | Defects: |  |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 06 Stee <br> GV64: 01 Goi <br> GV65: 12 This <br> GV66: 1 Tra <br> GV67: 4 Veh | ng left <br> straight <br> vehicle traveling off <br> ing <br> le departed roadway | oad on the left side |  |

## CAUSAL FACTOR: <br> Evasive Maneuver - Avoid Animal or Pedestrian <br> ROADSIDE DEPARTURE: Left

The subject vehicle was traveling in a northerly direction on a two-lane roadway in a $72 \mathrm{~km} / \mathrm{h}(45 \mathrm{mph})$ speed zone. The driver swerved to the left to avoid a deer that was entering the roadway, and the vehicle departed the left road edge. The driver subsequently swerved back to the right to avoid a utility pole and a construction sign. As the vehicle re-entered the road, the driver again swerved to the left which induced a counterclockwise yaw. The driver braked and braced against the steering wheel as the vehicle yawed off the left road edge. As the vehicle rotated to a near broadside orientation, it pitched to the right and overturned onto its right side. The hood area impacted a utility pole and a utility box. The vehicle rotated counterclockwise off the struck pole and overturned onto the roof where it came to rest. The primary causal factor involved evasive action by the driver to avoid a deer in the road. The driver had a BAC of 0.17 and intoxication was a secondary causal factor.


STANE SHQULDER
 CONSTRUCTIUN
AHEAD
SIGN UTILITY


TREES \& MAILBCXES alang east raad edge

```
GRASS
```



CAUSAL FACTOR: Vehicle Speed - Unsafe Driving Act
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-2-93 | Weather: | Clear/Cloudy |
| Time: | 0415 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 4 (K) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 21 | Year: <br> Vehicle Make: <br> Vehicle Model: | 1993 |
|  | Male |  | Ford |
|  | Intoxicated (alcohol/drugs) |  | Mustang/ <br> Mustang II |
|  | Yes | ABS: | Unknown |
|  | 1 | Defects: |  |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 06 Ste <br> GV64: 13 Ne <br> GV65: 13 Thi <br> GV66: 4 Ski <br> GV67: 4 Ve | ng left <br> tiating a curve <br> vehicle traveling off <br> ing laterally - count <br> le departed roadway | road on the right side tion |  |


| CAUSAL FACTOR: | Vehicle Speed - Unsafe Driving Act |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was traveling in an casterly direction on a rural two-lane roadway that curved to the left and had a positive slope. As the driver attempted to negotiate the left curve, the vehicle drifted off the right road edge onto the paved and gravel shoulder. The driver applied a rapid counterclockwise steering input in an attempt to steer the vehicle back onto the travel lane. The vehicle broke traction and yawed approximately 90 degrees counterclockwise across the roadway and departed the left shoulder. The right rear area of the vehicle impacted a mail box post. The vehicle subsequently pitched to the right and became airborne, traveling approximately 55 m in the air. The vehicle impacted several trees before coming to rest in heavy brush in a ditch, approximately 21 m off-road. Both road edge lines and the center lines were in poor condition. There were no reflective markers/delineators along the dark asphalt roadway. The driver was traveling at a high rate of speed, in excess of $161 \mathrm{~km} / \mathrm{h}(100 \mathrm{mph})$, and was under the influence of alcohol ( $\mathrm{BAC}=0.10$ ) and marijuana. The driver was operating the vehicle in a reckless manner (unsafe driving act) while intoxicated.

| PSU No. | Cose Number - Strotum 132A | Indicote North $\Theta$ |
| :---: | :---: | :---: |
|  |  |  |
|  |  |  |



## CAUSAL FACTOR: Driver Inattention

ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 7-3-93 <br> 1510 <br> Drive Off Road <br> 0 (O) | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Daylight <br> Urban |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 38 <br> Female <br> None <br> Unknown <br> 5 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1988 <br> Dodge <br> Caravan <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $64 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Driver Inattention
Right

The subject vehicle was westbound on a two-lane roadway during clear, daylight hours. The driver turned around to check on a crying child passenger and inadvertently steered off the right road edge. The right front corner area of the vehicle impacted a mailbox as the driver braked and steered in a counterclockwise direction. The vehicle traversed a driveway and a lawn area as it yawed slightly in a counterclockwise direction. The right side of the vehicle sideswiped a utility pole as it straddled a shallow ditch. The driver regained control of the vehicle and redirected it back onto the roadway. The outboard edges of the road were in poor (worn) condition, without edge lines. Gravel shoulders were bordered by lawn. The causal factor was inattention to the driving task.


## Vehicle Dynamic Scenario


Return to

Roadway Resolution $\quad$| Roadway |
| :---: |
| Departure |
| Crash |$\quad$ Frontal Impact

| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Other |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-3-93 | Weather: | Clear/Cloudy |
| Time: | 0740 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Daylight |
| Accident Severity: |  | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 25 | Year: | 1993 |
| Driver Sex: | Female | Vehicle Make: | Ford |
| Impairment: | None | Vehicle Model: | Escort/EXP |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 06 Steering left |  |  |  |
| GV64: 13 Negotiating a curve |  |  |  |
| GV65: 08 This vehicle loss of control due to other |  |  |  |
| GV66: 1 Tracking |  |  |  |
| GV67: 4 Vehicle departed roadway |  |  |  |

# CAUSAL FACTOR: Evasive Maneuver - Vehicle Encroaching into Lane Other 

## ROADSIDE DEPARTURE: <br> Left

The subject vehicle was proceeding in a westerly direction on a dry, two-lane, asphalt bypass that curved to the right. This road was physically divided from the opposing traffic lanes by a wide grass median. The vehicle was traveling in the passing lane at a driver estimated speed of $97-113 \mathrm{~km} / \mathrm{h}(60-70 \mathrm{mph})$. A vehicle (truck) traveling ahead of the subject vehicle kicked up a stone which struck and cracked the windshield of the subject vehicle. As a reflexive action, the subject driver steered to the left and exited the left edge of the roadway. As the vehicle crossed a wide paved shoulder and entered the grass median, the driver overcorrected back to the right. The vehicle reentered the roadway yawing in a clockwise direction, and crossed the roadway in a broadside skid to the left. The vehicle exited the right edge of the roadway, traveled approximately 4.6 m down a negative-sloped embankment, rolled to the left and came down on its top. The vehicle struck a tree with its right rear quarter panel (while upside down), spun around the tree (clockwise), and came to rest on its top, facing in a northerly direction.

## ACCIDENT COLLISION DIAGRAM




| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 8-3-93 | Weather: | Clear/Cloudy |
| Time: | 0200 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | None |
| Accident Severity: | 2 (B) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 22 | Year: | 1988 |
| Driver Sex: | Male | Vehicle Make: | Sab |
| Impairment: | Intoxicated <br> (alcohol/drugs) | Vehicle Model: | 99/99E/900 |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: |  | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 13 Neg <br> GV65: 12 Thi <br> GV66: $\quad 0$ No <br> GV67: 0 No | oidance actions <br> tiating a curve <br> vehicle traveling off the <br> oidance maneuver <br> voidance maneuver | road on the left side |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Driver Relinquishes Steering Control - Intoxicated <br> Left

The subject vehicle was traveling in an easterly direction on the inboard of three travel lanes on a divided interstate. The asphalt road surface was dry and level and curved to the left. Paved shoulders bordered both road edges and a concrete median barrier separated the east/westbound travel lanes. As the driver attempted to negotiate the left curve, the vehicle drifted off the inboard road edge, overrode a 0.6 m wide rumble strip, and traversed the paved shoulder before impacting a concrete median barrier. The driver subsequently applied a clockwise steering input which redirected the vehicle across the travel lanes and off the right road edge where the vehicle overturned. The driver was intoxicated ( $\mathrm{BAC}=0.15$ ) and was traveling at a high rate of speed. Driver intoxication was the primary causal factor with secondary factors involving high speed and probable drowsiness.
CSU No. 11 Case Number - Strotum 137F


| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Other |
| ROADSIDE DEPARTURE: | Right |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $\begin{aligned} & 1-1-93 \\ & 1120 \end{aligned}$ <br> Control/Traction Loss $1 \text { (C) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Unknown <br> Ice/Snow <br> Daylight <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 34 <br> Female <br> None <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1992 <br> Saturn <br> SL <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 4 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
|  | gand steering right <br> sful avoidance of previ ehicle traveling off the ng <br> stayed on roadway but | ad on the right side <br> ane where avoidance ma | uver was initiated |

## CAUSAL FACTOR: <br> Evasive Maneuver - Vehicle Encroaching into Lane Other

## ROADSIDE DEPARTURE: Right

The subject vehicle was traveling west on a level, straight section of a four-lane, undivided, concrete roadway after exiting a left curved segment. The roadway was icy and the boundary was defined by a bridge rail on both sides of the road. An eastbound vehicle encroached into the subject vehicle's left travel lane and the subject driver initiated a counterclockwise steering maneuver and applied the brakes resulting in the vehicle departing the right road side. The vehicle struck a 25 cm barrier curb and subsequently struck the bridge railing located 1.8 m from the roadway edge. The causal factor was evasive maneuver with loss of vehicle control on icy surface.



CAUSAL FACTOR:
Driver Inattention
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 5-1-93 | Weather: | Clear/Cloudy |
| Time: | 0115 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | None |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 32 | Year: | 1986 |
| Driver Sex: | Female | Vehicle Make: | Chevrolet |
| Impairment: | Other (alcoh. consumption <br> - BAC unknown) | Vehicle Model: | Sprint/ <br> Geo Sprint |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 |  |  |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| $\begin{array}{lll}\text { GV14: } & 01 & \mathrm{No} \\ \text { GV64: } & 01 & \text { Goi }\end{array}$ <br> GV65: 13 Thi <br> GV66: $\quad 0$ No <br> GV67: 0 No | oidance actions <br> straight <br> vehicle traveling off the edg <br> oidance maneuver <br> oidance maneuver | oad on the right side |  |

## CAUSAL FACTOR:

## ROADSIDE DEPARTURE: Right

The subject vehicle was traveling south in the right lane of a dry, level, four-lane, undivided, asphalt roadway. The driver dropped a purse on the floor and leaned over to pick it up when the vehicle drifted into the right curb. The driver was thrown to the right side of the vehicle. The vehicle subsequently veered to the left, crossed the travel lanes, traveled across a private driveway and lawn, and struck a large tree. The driver had consumed alcohol. There were no adverse weather conditions, however, the roadway was dark and not illuminated. The causal factor was driver inattention and steered off roadway. A contributory factor was the driver's consumption of alcohol.

ACCIDENT COLLISION DIAGRAM




```
CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Left
```

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 5-4-93 | Weather: | Clear/Cloudy |
| Time: | 0200 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 2 (B) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 30 | Year: | 1990 |
| Driver Sex: | Female | Vehicle Make: | Chevrolet |
| Impairment: | Other (alcoh. consumption <br> - BAC unknown) | Vehicle Model: | C, K, R, V-series |
| Familiarity with Road: | Unknown | ABS: | Unknown |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 09 Bra <br> GV64: $\quad 13$ Neg <br> GV65: 12 Thi <br> GV66: 1 Tra <br> GV67: 4 Veh | ing and steering right <br> tiating a curve <br> vehicle traveling off the edg ing <br> le departed roadway | oad on the left side |  |

# CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Vehicle Speed - Speed and Alcohol <br> Left 

The subject vehicle was traveling west on a ramp connecting two interstate roadways during the evening hours. The dry, concrete, single-lane roadway was not illuminated, curved to the right, and had a $+2 \%$ slope. The vehicle departed the left side of the roadway, traveled down a $-8 \%$ embankment, struck a ditch and rolled over. There were no sight lines or roadway restrictions. The off road terrain was open with no obstacles in the grassy area. The driver had consumed alcohol prior to the crash and lost control of the vehicle. The causal factor was excessive speed for the ramp and alcohol consumption.


Vehicle Dynamic Scenario


CAUSAL FACTOR:
Evasive Maneuver - Vehicle Encroaching into Lane Same Travel Direction

ROADSIDE DEPARTURE:
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 7-6-93 <br> 2115 <br> Drive Off Road $0 \text { (O) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Daylight <br> Urban |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 21 <br> Male <br> None <br> Unknown | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1980 <br> Chevrolet <br> Chevette <br> No <br> Other Failure |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Flush or curb <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 09 Braking and steering right <br> GV64: 01 Going straight <br> GV65: 04 This vehicle loss of control due to non-disabling vehicle problem <br> GV66: 1 Tracking <br> GV67: 4 Vehicle departed roadway |  |  |  |


| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Same Travel Direction |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was traveling north on a dry, urban, divided, concrete roadway during daylight hours. The driver entered the roadway from a service station and accelerated the vehicle to a speed of $48-56 \mathrm{~km} / \mathrm{h}(30-35 \mathrm{mph})$ in the outboard lane. The driver was operating the vehicle with defective brakes and approached slower moving traffic from the rear. The driver was inattentive to the driving task and steered off the road to the right to avoid the non-contact vehicles. The vehicle struck a mailbox that was located at the right road edge. The driver redirected the vehicle to the left and traveled along the roadway, before impacting another mailbox located adjacent to the left road edge.
PSU No. 12 Cose Number - Strotum $113 \mathrm{H} \quad$ Indicote North
pRNate dRveway

MALLBOX POST
$6^{*}$ CURB



Vehicle Dynamic Scenario


CAUSAL FACTOR: ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 7-2-93 <br> 0125 <br> End Departure $2 \text { (B) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> None <br> Urban |
| Driver/Occupant Information |  | Vehicle Info | ation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 30 <br> Female <br> Unknown <br> Unknown | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1989 <br> GMC <br> Jimmy <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 13 Negotiating a curve <br> GV65: 12 This vehicle traveling off the edge of the road on the left side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

# CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Driver Relinquishes Steering Control - Other <br> Left 

The subject vehicle was traveling on a dry, gravel road surface. The driver failed to initiate a turning maneuver on a 90 degree curve. Based on the roadway geometry and the location of the struck pole, it would appear that the driver was traveling on the left side of the roadway and departed the left road edge as the road curved to the right. The vehicle crossed a driveway and struck the pole with its center frontal area. The PAR indicated that the driver had been drinking, however, no BAC test was offered.


## Vehicle Dynamic Scenario



## CAUSAL FACTOR: Lost Directional Control <br> ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-7-93 | Weather: | Clear/Cloudy |
| Time: | 1135 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 45 | Year: | 1992 |
| Driver Sex: | Female | Vehicle Make: | Chevrolet |
| Impairment: | None | Vehicle Model: | Cavalier |
| Familiarity with Road: | Unknown | ABS: | Yes |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 06 Steering left |  |  |  |
| GV64: 01 Going straight |  |  |  |
| GV65: 12 This vehicle traveling off |  | road on the left side |  |
| GV66: 1 Tracking |  |  |  |
| GV67: 4 Vehicle departed roadway |  |  |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: Left

The subject vehicle was traveling in an easterly direction on a narrow, two-lane dirt/stone/gravel roadway during daylight hours. The road was straight and dry with a $-1 \%$ slope. There were no shoulders and ditches bordered both road edges. The vehicle overrode a washboard area which caused the driver to loose directional control. As a result, the vehicle crossed the westbound travel lane and departed the left road edge. The driver attempted to brake, but the vehicle exited the road in a tracking mode, entered the ditch, and overturned onto its roof.



CAUSAL FACTOR: Vehicle Speed - Speed and Driver Inexperience ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $\begin{aligned} & 8-6-93 \\ & 0920 \\ & \text { Contro/Traction Loss } \\ & 0(0) \end{aligned}$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Daylight <br> Rural |
| Driver/Occup | nt Information | Vehicle Info | ation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 16 <br> Female <br> None <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1990 <br> Chevrolet <br> Lumina <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Flush or curb <br> 3 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 09 Braking and steering right <br> GV64: 15 Merging <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 1 Tracking <br> GV67: 4 Vehicle departed roadway |  |  |  |

CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Vehicle Speed - Speed and Driver Inexperience
Right

The subject vehicle was entering the outboard lane of a divided expressway from a one-lane entrance ramp. As the driver entered the expressway, there was a bridge rail approximately 0.6 m outboard of the right road edge, and a tractor-trailer was traveling in the center lane. The driver was intimidated by the truck and felt sandwiched between the truck and the bridge. The driver braked and steered right to avoid the tractor-trailer, departed the right road edge, and struck a W-beam guardrail. Driver inexperience was the primary causal factor as the tractor-trailer remained in its travel lane and did not encroach into the driver's lane.



CAUSAL FACTOR: Lost Directional Control
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-5-93 | Weather: | Rain |
| Time: | 1645 | Surface Condition: | Ice/Snow |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 0 (0) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 27 | Year: | 1986 |
| Driver Sex: | Male | Vehicle Make: | Ford |
| Impairment: | None | Vehicle Model: | Ranger |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: |  | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> 56 km/h |
| Cluster Variables |  |  |  |
| GV14: 99 Unk <br> GV64: 13 Neg <br> GV65: 05 This <br> GV66: 9 Pre <br> GV67: 9 Dir | own <br> tiating a curve <br> vehicle loss of control d <br> ash stability unknown <br> tional consequences unk | conditions |  |


| CAUSAL FACTOR: | Lost Directional Control |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was traveling eastbound on a left curve section of an icy, two-lane, undivided roadway with a $-4 \%$ slope. The driver was making the transition from the curve to straight section and lost control of the vehicle on the icy road surface. The vehicle departed the right side of the straight segment of roadway and struck a snow embankment and a mailbox. The center line consisted of solid and broken yellow lines with passing permitted eastbound. There were no sight lines or roadway restrictions. The crash occurred in the rain during daylight hours. The causal factor was vehicle lost control on icy roadway. A contributing factor was vehicle traveling too fast for conditions.

## ACCIDENT COLLISION DIAGRAM




| CAUSAL FACTOR: | Driver Relinquishes Steering Control - Fell Asleep |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-4-93 | Weather: | Clear/Cloudy |
| Time: | 0753 | Surface Condition: |  |
| Accident Type: | Drive Off Road | Llghting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 21 | Year: | 1991 |
| Driver Sex: | Female | Vehicle Make: | Chevrolet |
| Impairment: | Fell Asleep | Vehicle Model: | S-10, T-10 |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Level <br> $105 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 13 Neg <br> GV65: 13 This <br> GV66: 0 No <br> GV67: 0 No | oidance actions tiating a curve vehicle traveling off oidance maneuver oidance maneuver | road on the right side |  |

CAUSAL FACTOR: Driver Relinquishes Steering Control - Fell Asleep
ROADSIDE DEPARTURE:

The subject vehicle was traveling north in the right lane of a dry, level, divided, asphalt interstate highway when it departed the right side of a left curve section. The crash occurred during the early morning, daylight hours. The vehicle traveled in a straight trajectory approximately 45 m across the asphalt shoulder and adjacent snow-covered grass area. The vehicle struck a tree with its frontal plane. Witnesses noted that the driver appeared to fall asleep and drift off the roadway. The causal factor was driver relinquished control by falling asleep and drifting off the roadway.
Psu No. 13 (


```
CAUSAL FACTOR: Lost Directional Control
ROADSIDE DEPARTURE: Left
```

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | $\begin{aligned} & 2-5-93 \\ & 0742 \end{aligned}$ <br> Control/Traction Loss $1 \text { (C) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Ice/Snow <br> Artificial lighting <br> Urban |
| Driver/Occup | nt Information | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 44 <br> Male <br> None <br> Unknown | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1978 <br> Oldsmobile <br> Delta 88 <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 03 Braking (lockup) <br> GV64: 01 Going straight <br> GV65: 05 This vehicle loss of control due to poor road conditions <br> GV66: 4 Skidding laterally - counterclockwise rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |

# CAUSAL FACTOR: Lost Directional Control <br> ROADSIDE DEPARTURE: Left 

The subject vehicle was traveling south on an icy, level, two-lane, asphalt roadway. The vehicle crossed the oncoming lane of travel, departed the left roadside in a counterclockwise rotation, rode over the grass area adjacent to the curb, and struck a tree with its right leading side. The driver attempted to regain control of the vehicle by counter-steering and applying the brakes with lock up. There were no adverse ambient weather conditions. The roadway was illuminated by overhead street lights and was delineated by a broken yellow center line which was in good condition. The causal factor was vehicle lost directional control as the result of the icy roadway condition.
PSU No. 13 Cose Number - Strotum O34H

Vehicle Dynamic Scenario


## CAUSAL FACTOR: Vehicle Failure <br> ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | $\begin{aligned} & 2-1-93 \\ & 1700 \\ & \text { Contro/Traction Loss } \\ & 2 \text { (B) } \end{aligned}$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Daylight <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 19 <br> Female <br> None <br> Unknown <br> 2 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1982 <br> Dodge <br> Omni <br> No <br> Other Failure |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided $2$ | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Steering right <br> GV64: 01 Going straight <br> GV65: 03 This vehicle loss of control due to disabling vehicle failure <br> GV66: 4 Skidding laterally - counterclockwise rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |

```
CAUSAL FACTOR: Vehicle Failure
ROADSIDE DEPARTURE: Left
```

The subject vehicle was traveling north on a dry, rural, two-lane roadway that was flanked on both sides by a shoulder approximately $2.4-3.0 \mathrm{~m}$ wide. Outside of the shoulder was a drainage ditch (approximately 1.2 m wide) and beyond the ditch was a line of trees. The driver stated that the vehicle was pulling left and suddenly pulled hard left at an estimated travel speed of $56 \mathrm{~km} / \mathrm{h}(35 \mathrm{mph})$. The driver attempted to correct by steering right but the vehicle departed the left roadside, hit the drainage ditch, and flipped over.



```
CAUSAL FACTOR: Driver Inattention
ROADSIDE DEPARTURE: Left
```

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-1-93 | Weather: | Clear/Cloudy |
| Time: | 1057 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 40 | Year: | 1993 |
| Driver Sex: | Female | Vehicle Make: | Chevrolet |
| Impairment: | None | Vehicle Model: | Astro Van |
| Familiarity with Road: | No | ABS: | Yes |
| No. of Occupants: | 2 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Flush or curb | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $105 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 01 Goin <br> GV65: 12 This <br> GV66: 0 No <br> GV67: 0 No | oidance actions <br> straight <br> vehicle traveling off the <br> oidance maneuver <br> oidance maneuver | oad on the left side |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: Left

The subject vehicle was traveling southbound on a dry, divided interstate roadway with a posted speed limit of $105 \mathrm{~km} / \mathrm{h}(65 \mathrm{mph})$ during daylight hours. The roadway consisted of two travel lanes in each direction that were separated by a depressed grass median. Paved shoulders bordered both edges of the divided travel lanes. The driver became inattentive to the driving task and allowed the vehicle to drift off the left road edge onto the grass median. The driver steered in a clockwise direction which induced a slight clockwise yaw, and then applied a rapid counterclockwise steering input which reversed the vehicle's rotation to counterclockwise. The vehicle crossed the depressed grass median in a broadside orientation, began rolling, struck an unprotected sign post, and came to rest in an upright orientation. The primary causal factor was driver inattention to the driving task. The vehicle was traveling at a high rate of speed which contributed to the severity of the crash, but was not a primary factor in causation.

ACCIDENT COLLISION DIAGRAM
PSU No. 13

Vehicle Dynamic Scenario


| CAUSAL FACTOR: | Lost Directional Control |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-5-93 | Weather: | Rain |
| Time: | 2135 | Surface Condition: | Wet |
| Accident Type: | Contro/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 0 (0) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 27 | Year: | 1989 |
| Driver Sex: | Female | Vehicle Make: | Chevrolet |
| Impairment: | None | Vehicle Model: | Cavalier |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: |  | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Stee <br> GV64: OI Goi <br> GV65: 05 This <br> GV66: 4 Ski <br> GV67: 4 Veh | ing right <br> straight <br> vehicle loss of control d <br> ding laterally - countercl <br> cle departed roadway | ad conditions <br> tion |  |


| CAUSAL FACTOR: | Lost Directional Control |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |

The subject vehicle was traveling in a northerly direction on a wet, straight, one-lane, concrete exit ramp with a $2 \%$ slope at a driver estimated speed of $26-32 \mathrm{~km} / \mathrm{h}(15-20 \mathrm{mph})$. The driver stated that the rear of the vehicle slid out (slight superelevation) and the driver steered right in an attempt to regain directional control. The vehicle subsequently yawed in a counterclockwise direction and departed the left road edge. The vehicle rotated down a grassy embankment and overturned onto its roof as it entered a shallow ditch at the base of the embankment. There were no reflective markers or delineators at the left edge of the exit ramp.



CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-7-93 | Weather: | Clear/Cloudy |
| Time: | 0224 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Artificial lighting |
| Accident Severity: | 4 (K) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 36 | Year: | 1978 |
| Driver Sex: | Male | Vehicle Make: | Chevrolet |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Fullsize Blazer |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 2 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions |  |  |  |
| GV64: 13 Negotiating a curve |  |  |  |
| GV65: 06 This vehicle loss of control due to traveling too fast for conditions |  |  |  |
| GV66: 0 No avoidance maneuver |  |  |  |
| GV67: 0 No avoidance maneuver |  |  |  |


| CAUSAL FACTOR: | Vehicle Speed - Speed and Alcohol |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was traveling on a sharp left curve section of a dry, two-lane, residential, asphalt roadway in a $40 \mathrm{~km} / \mathrm{h}(25 \mathrm{mph})$ speed zone. The driver was intoxicated ( $\mathrm{BAC}=0.13$ ) and attempted to negotiate the curve at an unsafe speed. The vehicle yawed in a counterclockwise direction and departed the right road edge. The vehicle continued in a southerly direction as it yawed onto a lawn area adjacent to the road edge. The side of the vehicle impacted a large diameter tree and subsequently overturned as it returned to the travel lane.

## ACCIDENT COLLISION DIAGRAM

PSU No. 13 Cose Number - Stroum

Vehicle Dynamic Scenario

CAUSAL FACTOR: Driver Relinquishes Steering Control - Fell Asleep

ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 7-4-93 <br> 1735 <br> Drive Off Road $2 \text { (B) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Daylight <br> Rural |
| Driver/Occupant Information |  | Vehicle Info | mation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 16 <br> Male <br> Fell Asleep <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1990 <br> Dodge <br> Dynasty <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 12 This vehicle traveling off the edge of the road on the left side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Driver Relinquishes Steering Control - Fell Asleep <br> Left

The subject vehicle was proceeding in a southerly direction on a dry, straight, level, two-lane, rural, asphalt roadway during daylight hours. The driver fell asleep and allowed the vehicle the to drift off the left edge of the roadway. The vehicle crossed a paved shoulder, entered a wide drainage ditch, struck a culvert at the end of the ditch with its lower frontal area, traversed a driveway beyond the culvert, and then struck a large diameter tree with its center frontal area. The vehicle then rotated in a clockwise direction, struck a second large tree with its left door, and came to rest. The roadway had edge lines and a broken yellow center line.



CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-7-93 | Weather: | Clear/Cloudy |
| Time: | 0113 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 0 (O) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 31 | Year: | 1979 |
| Driver Sex: | Male | Vehicle Make: | Ford |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | F-series pickup |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided $2$ | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 01 Goi <br> GV65: 13 Thi <br> GV66: 0 No <br> GV67: 0 No | oidance actions <br> straight <br> vehicle traveling off <br> oidance maneuver <br> oidance maneuver | road on the right side |  |

CAUSAL FACTOR: ROADSIDE DEPARTURE:

## Driver Relinquishes Steering Control - Intoxicated

Right

The subject vehicle was traveling on a dry, straight, level, rural, two-lane, rural, asphalt roadway with a posted speed limit of $89 \mathrm{~km} / \mathrm{h}(55 \mathrm{mph})$. The vehicle departed the right road edge, struck the only reflective delineator along the road edge, continued in a northerly direction, and impacted a wooden utility pole. The roadway had a double yellow center line and no edge lines. There were no stabilized shoulders and a ditch paralleled both road edges. The driver claims to have swerved to the right to avoid a deer, however, rotating tire marks at the scene indicate a gradual road departure with brake application. Evidence of a gradual departure from the road along with a driver BAC of 0.14 indicates that the primary causal factor was intoxication.

## ACCIDENT COLLISION DIAGRAM



Vehicle Dynamic Scenario



CAUSAL FACTOR: Vehicle Speed - Excessive
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-1-93 | Weather: | Clear/Cloudy |
| Time: | 1738 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 0 (0) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | Unknown | Year: | 1984 |
| Driver Sex: | Unknown | Vehicle Make: | Chevrolet |
| Impairment: | Unknown | Vehicle Model: | Celebrity |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 3 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided $2$ | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions |  |  |  |
| GV64: 10 Turning left |  |  |  |
| GV65: 06 This vehicle loss of control due to traveling too fast for conditions |  |  |  |
| GV66: 0 No avoidance maneuver |  |  |  |
| GV67: 0 No avoidance maneuver |  |  |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Vehicle Speed - Excessive <br> Right

The subject vehicle was traveling in a northerly direction on a two-lane residential street and initiated a left turn at a three-leg T-intersection at a unsafe speed. The vehicle drifted wide into the turn and departed the right road edge. The vehicle subsequently traversed a sidewalk and traveled up an embankment where it came to rest. The vehicle was stolen and the driver and occupants exited the vehicle and fled the scene. The only known causal factor was that the driver attempted the left turn at an unsafe speed.


Vehicle Dynamic Scenario


CAUSAL FACTOR: Vehicle Speed - Unsafe Driving Act
ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $7-5-93$ <br> 0214 <br> Control/Traction Loss $2 \text { (B) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Artificial lighting <br> Rural |
| Driver/Occup | nt Information | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 17 <br> Male <br> None <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1990 <br> Ford <br> Probe <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 03 Braking (lockup) <br> GV64: 13 Negotiating a curve <br> GV65: 06 This vehicle loss of control due to traveling too fast for conditions <br> GV66: 3 Skidding laterally - clockwise rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |

```
CAUSAL FACTOR: Vehicle Speed - Unsafe Driving Act
ROADSIDE DEPARTURE: Left
```

The subject vehicle was traveling in a westerly direction on a right curve section of a dry, level, rural two-lane roadway with a posted speed limit of $56 \mathrm{~km} / \mathrm{h}(35 \mathrm{mph})$. The driver ran a stop sign and, upon entering a four-leg intersection, the vehicle broke traction. The driver attempted to negotiate the apex of the curve and braked but the vehicle yawed in a clockwise direction and traveled approximately 40 m before departing the left road edge. The vehicle continued for 20 m along the left road edge and struck several small trees with the left rear side area of the vehicle. This sequence redirected the vehicle to a near tracking mode as it traveled an additional 21 m before impacting a tree with the right frontal area. The driver was operating the vehicle in a reckless manner at a high rate of speed while under the influence of alcohol. The vehicle speed was computed at approximately $122 \mathrm{~km} / \mathrm{h}(76 \mathrm{mph})$ from physical evidence and vehicle damage.

## ACCIDENT COLLISION DIAGRAM

PSU No. 13 Case Number - Strotum 161E

# ACCIDENT COLLISION DIAGRAM 

NOT AVAILABLE AT THE

TIME OF THIS PRINTING


| CAUSAL FACTOR: | Driver Relinquishes Steering Control - Fell Asleep |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-6-93 | Weather: | Clear/Cloudy |
| Time: | 0545 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 0 (0) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 17 | Year: | 1978 |
| Driver Sex: | Female | Vehicle Make: | Chevrolet |
| Impairment: | Fell Asleep | Vehicle Model: | G-series van |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions |  |  |  |
| GV64: 13 Negotiating a curve |  |  |  |
| GV65: 13 This vehicle traveling off |  | oad on the right side |  |
| GV66: $\quad 0$ No | oidance maneuver |  |  |
| GV67: 0 No | oidance maneuver |  |  |


| CAUSAL FACTOR: | Driver Relinquishes Steering Control - Fell Asleep |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was traveling on left curve segment of a dry, level, two-lane, asphalt roadway with a $+1 \%$ slope during the dawn hours. The driver apparently fell asleep due to fatigue and the vehicle departed the roadway. The vehicle traveled along the adjacent 5 m wide grass shoulder for approximately 35 m and then struck shrubs and trees. The area was rural in nature with heavy vegetation on both sides of the roadway with an off set distance of approximately 5 m . There were no immediate obstacles between the roadway and tree line. The roadway edges were not marked and reflective delineators were not present. Pavement markings consisted of two yellow barrier center lines. The causal factor was driver fatigue-fell asleep.
PSU No. 13 Cose Number - Strotum 164H $\quad$ Indicote North $\Theta$



| CAUSAL FACTOR: | Driver Relinquishes Steering Control - Fell Asleep |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 8-3-93 <br> 1234 <br> Control/Traction Loss $3(\mathrm{~A})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Daylight <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 24 <br> Female <br> Fell Asleep <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1989 <br> Chevrolet <br> S-10, T-10 <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Physical barrier <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $105 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 12 This vehicle traveling off the edge of the road on the left side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

## CAUSAL FACTOR: <br> Driver Relinquishes Steering Control - Fell Asleep <br> ROADSIDE DEPARTURE: Left

The subject vehicle was traveling on a dry, level, four-lane, divided, asphalt interstate. The highway had limited access with two lanes in each direction and was separated by a tree lined median. The driver apparently fell asleep while driving in the left lane at a speed of $105-113 \mathrm{~km} / \mathrm{h}$ ( $65-70 \mathrm{mph}$ ) based on calculations using the radius of sideslip curvature formula. The vehicle exited the left side of the roadway across the 1.2 m paved shoulder and traveled on the grass area adjacent to the shoulder. At approximately 1.3 m along this travel path, the driver steered to the right which rotated the vehicle clockwise and reversed the travel path back onto the roadway. The vehicle traveled across the roadway and departed the right side where, after the left side tires furrowed into the ground, it began a right over left rollover sequence. After one complete revolution, the vehicle contacted two trees with its left side. The final rest position of the vehicle was against three trees which were approximately 12 m from the roadway edge line. The road had a solid yellow left roadway edge line, white broken lane lines and a right solid white line. All pavement markings were in new condition. Reflective delineators were only present on the right side. The causal factor was driver fatigue-fell asleep.


Vehicle Dynamic Scenario


CAUSAL FACTOR: ROADSIDE DEPARTURE:

Vehicle Speed - Speed and Driver Inexperience Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 8-1-93 <br> 1259 <br> Control/Traction Loss <br> 1 (C) | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Rain <br> Wet <br> Daylight <br> Rural |
| Driver/Occu | nt Information | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 16 <br> Female <br> None <br> No <br> 3 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1987 <br> Nissan/Datsun <br> Pathfinder <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 1 | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Level <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 06 Steering left <br> GV64: 01 Going straight <br> GV65: 06 This vehicle loss of control due to traveling too fast for conditions <br> GV66: 1 Tracking <br> GV67: 4 Vehicle departed roadway |  |  |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE:

## Vehicle Speed - Speed and Driver Inexperience

Right

The subject vehicle was traveling in a northerly direction on a one-lane entrance ramp to an expressway at a speed of $48-64 \mathrm{~km} / \mathrm{h}(30-40 \mathrm{mph})$. The asphalt road surface was wet due to rain. The driver had exited a right curve and accelerated on the posted $40 \mathrm{~km} / \mathrm{h}(25 \mathrm{mph}) \mathrm{ramp}$ in an attempt to get up to expressway speed. As the driver exited the curve, the vehicle yawed in a clockwise direction and departed the right road edge onto the paved shoulder. The driver subsequently applied a counterclockwise steer input which reversed the rotation of the vehicle to counterclockwise. The vehicle yawed across the travel lane and departed the left road edge in a near broadside orientation. The vehicle exited the shoulder and overturned down a shallow grassy embankment. Vehicle speed and driver inexperience for the wet conditions were the primary causal factors for the crash.


## Vehicle Dynamic Scenario



CAUSAL FACTOR:
ROADSIDE DEPARTURE: Left

Lost Directional Control

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> AccIdent Type: <br> Accident Severity: | 8-5-93 <br> 0737 <br> Stationary Object $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Rain <br> Wet <br> Daylight <br> Urban |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 19 <br> Female <br> None <br> Unknown <br> 3 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1985 <br> Ford <br> Escort/EXP <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided 1 | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 08 Braking and steering left <br> GV64: 15 Merging <br> GV65: 06 This vehicle loss of control due to traveling too fast for conditions <br> GV66: 4 Skidding laterally - counterclockwise rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |

```
CAUSAL FACTOR: Lost Directional Control
ROADSIDE DEPARTURE: Left
```

The subject vehicle was traveling in a southerly direction on a one-lane entrance ramp approaching a two-lane divided highway. The concrete road surface was wet due to rain and curved to the right. The driver estimated travel speed was $72 \mathrm{~km} / \mathrm{h}(45 \mathrm{mph}$ ) approaching the highway. Due to the wet road surface, the vehicle began to hydroplane and broke traction. The driver probably braked and steered and reported that the engine subsequently stalled. The vehicle subsequently yawed in a counterclockwise direction and crossed the southbound travel lanes. The vehicle departed the inboard road edge of the divided highway and struck the concrete median barriers.


## Vehicle Dynamic Scenario



## CAUSAL FACTOR: Lost Directional Control <br> ROADSIDE DEPARTURE:

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 9-2-93 <br> 1910 <br> Control/Traction Loss $3(\mathrm{~A})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Rain <br> Wet <br> Daylight <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 25 <br> Female <br> None <br> Unknown <br> 2 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1986 <br> Mercury <br> Topaz <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided $2$ | Allgnment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 09 Braking and steering right <br> GV64: 01 Going straight <br> GV65: 06 This vehicle loss of control due to traveling too fast for conditions <br> GV66: 3 Skidding laterally - clockwise rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |

```
CAUSAL FACTOR: Lost Directional Control
ROADSIDE DEPARTURE: Right
```

The subject vehicle was southbound on a straight, wet, two-lane, asphalt roadway with a $+1 \%$ slope in an $89 \mathrm{~km} / \mathrm{h}$ ( 55 mph ) speed zone. The driver stated that the vehicle began to hydroplane on the wet surface and drifted across the center line. There was another vehicle approaching from the opposite direction so the subject driver steered in a clockwise direction and braked. The vehicle subsequently yawed in a clockwise direction and departed the right road edge in a near broadside orientation. The vehicle crossed a gravel shoulder and overturned on a grassy area adjacent to the shoulder. The primary causal factor was loss of control due to the wet road surface.


Vehicle Dynamic Scenario


| CAUSAL FACTOR: | Vehicle Speed - Unsafe Driving Act |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-193 | Weather: | Clear/Cloudy |
| Time: | 1555 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 0 (0) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 30 | Year: | 1993 |
| Driver Sex: | Male | Vehicle Make: | Chevrolet |
| Impairment: | None | Vehicle Model: | Lumina |
| Familiarity with Road: | No | ABS: | Yes |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Allgnment: <br> Slope: | Straight <br> Level |
| No. of Lanes: | 2 | Speed Limit: | $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 99 Unknown |  |  |  |
| GV64: 01 Going straight |  |  |  |
| GV65: 06 This vehicle loss of control d |  | g too fast for conditions |  |
| GV66: 9 Precrash stability unknown |  |  |  |
| GV67: 9 Directional consequences unknown |  |  |  |

```
CAUSAL FACTOR: Vehicle Speed - Unsafe Driving Act
ROADSIDE DEPARTURE: Left
```

The subject vehicle was proceeding north on a dry, level, two-lane, residential, asphalt roadway. The driver was traveling at an excessive speed in a $56 \mathrm{~km} / \mathrm{h}(35 \mathrm{mph})$ speed zone. The driver was charged with careless driving and excessive speed.

ACCIDENT COLLISION DIAGRAM



| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Same Travel Direction |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 2-2-93 | Weather: | Clear/Cloudy |
| Time: | 0915 | Surface Condition: |  |
| Accident Type: | Drive Off Road | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 21 | Year: <br> Vehicle Make: <br> Vehicle Model: | 1985 |
|  | Female |  | Dodge |
|  | None |  | Daytona |
|  | Unknown | ABS: | Yes |
|  | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Alignment: <br> Slope: | Straight <br> Level |
| No. of Lanes: | 3 | Speed Limit: | $89 \mathrm{~km} / \mathrm{h}$ |

## Cluster Variables

GV14: 06 Steering left
GV64: 16 Successful avoidance of previous event
GV65: 61 Other vehicle encroaching into lane from adjacent lane (same direction) over right lane line
GV66: 1 Tracking
GV67: 4 Vehicle departed roadway

```
CAUSAL FACTOR: Evasive Maneuver - Vehicle Encroaching into Lane -
    Same Travel Direction
ROADSIDE DEPARTURE: Left
```

The subject vehicle was traveling along a six-lane, divided highway. The vehicle was involved in evasive maneuvers with another car. The vehicle was initially in the left lane. A phantom vehicle cut the subject vehicle off causing the subject vehicle to swerve left into a jersey barrier.

## ACCIDENT COLLIIION DIAGRAM

PSU No. 41


## CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 5-2-93 | Weather: | Clear/Cloudy |
| Time: | 1334 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Artificial lighting |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 24 | Year: | 1970 |
| Driver Sex: | Male | Vehicle Make: | Jeep |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Unknown (light truck) |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Medlan): | Not divided | Allgnment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 99 Unknown |  |  |  |
| GV64: 01 Going straight |  |  |  |
| GV65: 12 This vehicle traveling off the edge of the road on the left side |  |  |  |
| GV66: 9 Precrash stability unknown |  |  |  |
| GV67: 9 Directional consequences unknown |  |  |  |

## CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated ROADSIDE DEPARTURE: Left

The subject vehicle was traveling along a two-lane, rural road. The driver relinquished control of the vehicle and veered left off the road. The vehicle entered the front area of a service station and continued across the lot until impacting a pole with the left side of the vehicle. The vehicle then pitched right, impacted a second pole on the vehicle's right side, traveled up a hill and rolled over, ejecting the driver. The driver was under the influence of alcohol and drugs.

ACCIDENT COLLISION DIAGRAM


Vehicle Dynamic Scenario


CAUSAL FACTOR: Lost Directional Control
ROADSIDE DEPARTURE:

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 8-2-93 | Weather: | Rain |
| Time: | 1247 | Surface Condition: | Wet |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: |  | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 21 | Year: | 1992 |
| Driver Sex: | Male | Vehicle Make: | Ford |
| Impairment: | None | Vehicle Model: | Ranger |
| Familiarity with Road: | Unknown | ABS: | Yes |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Level <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 09 Braking and steering right |  |  |  |
| GV64: 13 Negotiating a curve |  |  |  |
| GV65: 05 This vehicle loss of control due to poor road conditions |  |  |  |
| GV66: 3 Skidding laterally - clockwise rotation |  |  |  |
| GV67: 4 Vehicle departed roadway |  |  |  |

The subject vehicle was exiting an expressway and traveling in a northerly direction on a wet, one-lane exit ramp that was bordered on both sides by concrete median barriers. As the driver completed the right curve and entered the left curve, the driver noted water and braked. The vehicle yawed and the driver steered in both directions in an attempt to regain control. The vehicle subsequently yawed clockwise, departed the right road edge and impacted the concrete barrier with its frontal area. Based on the slides, the ramp was an S-configuration. Water had accumulated on the ramp due to heavy rain and drain backups. Loss of control was attributed to the standing water on the roadway. The geometry of the ramp and the concrete barriers limited the driver's view of the road surface in the direction of travel.

Roadway
Departure
Crash $\quad \begin{aligned} & \text { Frontal Impact/ } \\ & \text { Rollover }\end{aligned}$ Return to
Roadway $\qquad$
Controlled /
Uncontrolled - Yaw Movement
Controlled /
Uncontrolled - Yaw Movement

```
CAUSAL FACTOR: Evasive Maneuver - Avoid Animal or Pedestrian
ROADSIDE DEPARTURE: Right
```

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-3-93 | Weather: | Clear/cloudy |
| Time: | 0645 | Surface Condition: | Dry |
| Accident Type: | Avoid Collision | Lighting: | Daylight |
| Accident Severity: | 0 (0) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 36 | Year: | 1993 |
| Driver Sex: | Male | Vehicle Make: | Ford |
| Impairment: | None | Vehicle Model: | Escort/EXP |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 5 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 09 Braking and steering right |  |  |  |
| GV64: 13 Negotiating a curve |  |  |  |
| GV65: 87 Animal in roadway |  |  |  |
| GV66: 1 Tracking |  |  |  |
| GV67: 4 Vehicle departed roadway |  |  |  |

CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Evasive Maneuver - Avoid Animal or Pedestrian
Right

The subject vehicle was proceeding along a two-lane, rural road traveling approximately $72 \mathrm{~km} / \mathrm{h}(45 \mathrm{mph})$. A large dog jumped onto the roadway. The driver made an evasive maneuver to avoid the dog and the vehicle's right wheels dropped off the right shoulder of the road and started to dig in. The driver over-corrected, lost control and had further road excursions.



CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Vehicle Failure
Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-7-93 | Weather: | Clear/Cloudy |
| Time: | 1840 | Surface Condition: |  |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 18 | Year: | 1980 |
| Driver Sex: | Male | Vehicle Make: | Nissan/Datsun |
| Impairment: | None | Vehicle Model: | Z-car, ZX |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | Other Failure |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Flush or curb | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 09 Braking and steering right |  |  |  |
| GV64: 15 Merging |  |  |  |
| GV65: 03 This vehicle loss of control due to disabling vehicle failure |  |  |  |
| GV66: 22 Skidding longitudinally - less than 30 degrees rotation |  |  |  |
| GV67: 4 Vehicle departed roadway |  |  |  |


| CAUSAL FACTOR: | Vehicle Failure |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |

The subject vehicle pulled out onto a 4-lane, divided roadway. As the driver merged into the right lane, the left wheel fell off. The driver lost control of the vehicle and veered left off the roadway onto the center median. The vehicle slid along the median and came to rest. The vehicle had just left an automotive repair shop where its brakes had been repaired.



CAUSAL FACTOR:
Driver Relinquishes Steering Control - Fell Asleep ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-4-93 | Weather: | Clear/Cloudy |
| Time: | 0522 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 0 (0) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 26 | Year: | 1984 |
| Driver Sex: | Male | Vehicle Make: | Pontiac |
| Impairment: | Other (driver fatigued) | Vehicle Model: | J-2000/2000/ Sunbird |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions |  |  |  |
| GV64: 13 Negotiating a curve |  |  |  |
| GV65: 12 This vehicle traveling off the edge of the road on the left side |  |  |  |
| GV66: 0 No avoidance maneuver |  |  |  |
| GV67: 0 No avoidance maneuver |  |  |  |

## CAUSAL FACTOR: <br> Driver Relinquishes Steering Control - Fell Asleep <br> ROADSIDE DEPARTURE: <br> Left

The subject vehicle was traveling on a two-lane, divided roadway in an $89 \mathrm{~km} / \mathrm{h}(55 \mathrm{mph})$ speed zone during dark, early morning hours. The driver exited the divided roadway to the right onto a one-lane exit ramp that curved to the right. As the driver initiated the maneuver, the vehicle drifted off the left edge of the ramp and onto the grassy area adjacent to the left roadedge. The driver applied a rapid clockwise steering input which initiated a clockwise yaw. The vehicle rotated across the ramp and departed the right edge in a near broadside orientation. The vehicle struck several shrubs before coming to rest in a catch basin beyond the shrubs. The driver was noted as fatigued on the PAR.



| CAUSAL FACTOR: | Vehicle Speed - Speed and Alcohol |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-7-93 | Weather: | Clear/Cloudy |
| Time: | 0012 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 4 (K) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 27 | Year: | 1992 |
| Driver Sex: | Male | Vehicle Make: | Isuzu |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Amigo |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Allgnment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 06 Steering left |  |  |  |
| GV64: 13 Negotiating a curve |  |  |  |
| GV65: 13 This vehicle traveling off |  | oad on the right side |  |
| GV66: 4 Skidding laterally - coun |  |  |  |
| GV67: 4 Ve | le departed roadwa |  |  |

# CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Right <br> <br> \section*{Vehicle Speed - Speed and Alcohol} 

 <br> <br> \section*{Vehicle Speed - Speed and Alcohol}}

The subject vehicle was traveling on a dark, unlit, rural, two-lane, asphalt road that curved to the left with a hillcrest at the apex of the curve. While attempting to negotiate the left curve at an unsafe speed, the vehicle broke traction and yawing in a counterclockwise direction. The vehicle departed the right roadedge near the apex of the curve at a 3-leg intersection. The vehicle traversed the mouth of the intersection and departed the southeast corner in a yawed trajectory and traveled onto a grassy area. The right front tire entered a shallow drainage ditch as the right side area impacted a sign post. As a result, the vehicle overturned and came to rest on its wheels. The belted driver remained in the vehicle, however, the driver expired at the scene. The medical report stated the driver was intoxicated $(\mathrm{BAC}=0.11)$ and was apparently eating a taco while driving. The PAR listed 40 m of pre-impact tire marks. The road surface was repaved prior to the NASS investigation, therefore all physical evidence on the road surface was covered. There were no markings on the pavement at the time of the inspection. The PAR schematic did illustrate double yellow centerlines. There were no reflective markers or delineators along either roadedge. The PAR listed alcohol and vehicle speed as the primary causal factors.


## Vehicle Dynamic Scenario



CAUSAL FACTOR: Driver Inattention
ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: |  | Weather: | Clear/Cloudy |
| Time: | 2140 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 4 (K) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 15 | Year: | 1987 |
| Driver Sex: | Male | Vehicle Make: | Plymouth |
| Impairment: | None | Vehicle Model: | Horizon |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 2 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 08 Bral <br> GV64: 13 Neg <br> GV65: 10 This <br> GV66: 1 Trac <br> GV67: 4 Veh | g and steering left iating a curve vehicle traveling ove ing <br> le departed roadway | left side of travel lane |  |

# CAUSAL FACTOR: Driver Inattention <br> ROADSIDE DEPARTURE: <br> Left 

The subject vehicle was traveling along a two-lane, urban roadway. The driver was concentrating on the rear view mirror when the vehicle drifted into the left lane and finally off the roadway. The vehicle impacted a tree off the roadway surface.



| CAUSAL FACTOR: | Driver Inattention |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 2-5-93 | Weather: | Clear/Cloudy |
| Time: | 0020 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 0 (0) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 17 | Year: | 1989 |
| Driver Sex: | Male | Vehicle Make: | Toyota |
| Impairment: | None | Vehicle Model: | 4-Runner |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> 48 km/h |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions |  |  |  |
| GV64: 13 Negotiating a curve |  |  |  |
| GV65: 13 This vehicle traveling off the edge of the road on the right side |  |  |  |
| GV66: 0 No avoidance maneuver |  |  |  |
| GV67: 0 No avoidance maneuver |  |  |  |

# CAUSAL FACTOR: ROADSIDE DEPARTURE: Driver Inattention Right 

The subject vehicle was traveling along a two-lane, rural roadway. The driver was inattentive and drifted off the right side of road. The driver applied the brakes and attempted to turn left, but impacted a pole with the right front side of the vehicle.

ACCIDENT COLLISION DIAGRAM
PSu No. 45 Cose Number - Stroum 0396


CAUSAL FACTOR: ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 2-3-93 <br> 0456 <br> Drive Off Road $2 \text { (B) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Rain <br> Wet <br> Artificial lighting <br> Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 34 <br> Female <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1972 <br> Mercury <br> Marquis/ <br> Monterey <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated
ROADSIDE DEPARTURE: ..... Right

The subject vehicle was traveling on a wet, lit, rural, two-lane roadway. The driver drifted off the right side of the road and impacted a pole. The driver was charged with DUI. The driver had been drinking and was going home.

## ACCIDENT COLLISION DIAGRAM




CAUSAL FACTOR: Vehicle Speed - Speed and Driver Inexperience ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-1-93 | Weather: | Clear/Cloudy |
| Time: | 2156 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | None |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 16 | Year: | 1991 |
| Driver Sex: | Female | Vehicle Make: | Honda |
| Impairment: | None | Vehicle Model: | Civic/CRX |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 3 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 09 Braking and steering right |  |  |  |
| GV64: 13 Negotiating a curve |  |  |  |
| QV65: 06 This vehicle loss of control du |  | g too fast for conditions |  |
| GV66: 3 Skidding laterally - clockwise |  |  |  |
| GV67: 4 Vehicle departed roadway |  |  |  |

## CAUSAL FACTOR:

ROADSIDE DEPARTURE:

Vehicle Speed - Speed and Driver Inexperience
Right

The subject vehicle was traveling on a dark, unlit, two-lane, undivided, dry, asphalt roadway which curved to the left and had a $-3 \%$ slope. The driver was distracted by the passengers and entered the curve at a high rate of speed, loosing control of the vehicle. The vehicle departed the right side of the roadway in clockwise rotation and struck a tree with the left side plane. A curve advisory speed limit of $32 \mathrm{~km} / \mathrm{h}(20 \mathrm{mph})$ was posted prior to the curve. Roadway edge lines consisted of solid white lines which were in poor condition. A full barrier yellow centerline was also in poor condition. The causal factor was inexperience of the driver in conjunction with the vehicle's pre-curve travel speed.



```
CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Left
```

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-1-93 | Weather: | Clear/Cloudy |
| Time: | 1613 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 29 | Year: | 1987 |
| Driver Sex: | Female | Vehicle Make: | Dodge |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Dakota |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Allgnment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $64 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 09 Braking and steering right |  |  |  |
| GV64: 01 Going straight |  |  |  |
| GV65: 12 This vehicle traveling off the edge of the road on the left side |  |  |  |
| GV66: 2 Skidding longitudinally - less than 30 degrees rotation |  |  |  |
| GV67: 4 Vehicle departed roadway |  |  |  |

```
CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Left
```

The subject vehicle was traveling eastbound on a dry, straight, undivided, two-lane, asphalt roadway during daylight hours. The vehicle departed the left roadedge and rotated in a clockwise pattern across a grass lawn and struck a tree with its right side plane after rotating approximately 270 degrees and traveling 65 meters along the lawn. The left road edge line was delineated by a solid white line which was worn and partially masked by grass overgrowth. The yellow centerline consisted of a solid line (against vehicle's travel lane) and broken line which permitted passing for westbound traffic. The driver's alcohol level was measured at 0.27 by the hospital. The off road area for recovery was generally free of obstacles with the exception of a utility pole line located 6.5 m from the road edge and poles spaced 30 m apart. A shallow drainage ditch, located 0.6 m from the road edgeline and approximately 0.3 m deep, did not appear to be a major obstacle for vehicle recovery. The causal factor was high vehicle speed with alcohol consumption.



CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-6-93 | Weather: | Clear/Cloudy |
| Time: | 2358 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Artificial lighting |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 17 | Year: | 1984 |
| Driver Sex: | Male | Vehicle Make: | Ford |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Tempo |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions |  |  |  |
| GV64: 01 Going straight |  |  |  |
| GV65: 13 This vehicle traveling off |  | oad on the right side |  |
| GV66: 0 No avoidance maneuver |  |  |  |
| GV67: 0 No avoidance maneuver |  |  |  |

CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Driver Relinquishes Steering Control - Intoxicated
Right

The subject vehicle was traveling westbound on a dry, lit, two-lane, undivided roadway during the evening hours. The driver swerved back and forth in the lane. The vehicle departed the right road edge, traveled across the narrow grass and rock shoulder which was 0.3 m wide and entered a ditch. The vehicle continued approximately 2 m and struck a driveway culvert. It subsequently rotated clockwise and came to rest rotated approximately 90 degrees from its travel direction. The ditch provided a terrain boundary which limited the vehicle's lateral off road trajectory to 0.3 m . There were no obstacles along the narrow shoulder or in the roadway. The driver's ability was impaired by alcohol consumption. The causal factor was intoxication.


Vehicle Dynamic Scenario


CAUSAL FACTOR:
Driver Relinquishes Steering Control - Intoxicated
ROADSIDE DEPARTURE:

Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-5-93 | Weather: | Clear/Cloudy |
| Time: | 2220 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: |  |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 24 | Year: | 1988 |
| Driver Sex: | Male | Vehicle Make: | Mazda |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Pickup |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 01 Goin <br> GV65: 13 This <br> GV66: 0 No a <br> GV67: 0 No | oidance actions <br> straight <br> vehicle traveling of oidance maneuver <br> oidance maneuver | oad on the right side |  |

# CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Right <br> <br> \section*{Driver Relinquishes Steering Control - Intoxicated} 

 <br> <br> \section*{Driver Relinquishes Steering Control - Intoxicated}}

The subject vehicle was traveling on a dry, six-lane, divided, asphalt, interstate with three travel lanes in each direction. The vehicle drifted off the roadway, across the right shoulder, and traveled approximately 25 m on the grass area before striking a sign post which was located 10.6 m laterally from the roadway edge line. The vehicle continued another 15 m and struck a drainage culvert. It came to rest after traveling another 12 m . The driver of the vehicle was intoxicated ( $B A C=0.32$ ). The roadway edge lines consisted of a solid yellow line adjacent to the new jersey barrier in the median and a white solid line along the right shoulder area. There were broken white lines delineating the three travel lanes. All lane markings were in new condition. A paved (asphalt) shoulder abutted the right travel lane and was 3.9 m wide. A well managed negative cross slope grassy area was adjacent to the paved shoulder. This area was approximately 5 m wide. Roadway delineators were located in the grassy area adjacent to the paved shoulder and were spaced approximately 45 m apart. These were designed with reflective qualities and were made from fiberglass materials. The causal factor was driver relinquished steering control of the vehicle as the result of intoxication.

## ACCIDENT COLLISION DIAGRAM



Vehicle Dynamic Scenario


## CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol <br> ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-1-93 | Weather: | Clear/Cloudy |
| Time: | 2336 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Artificial lighting |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 23 | Year: | 1986 |
|  | Male | Vehicle Make: | Ford |
|  | Intoxicated (alcohol/drugs) | Vehicle Model: | Escort/EXP |
|  | Unknown | ABS: | No |
|  | 2 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 3 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 02 Braking (no lockup) |  |  |  |
| GV64: 01 Going straight |  |  |  |
| GV65: 12 This vehicle traveling off the edge of the road on the left side |  |  |  |
| GV66: 2 Skidding longitudinally - less than 30 degrees rotation |  |  |  |
| GV67: 4 Vehicle departed roadway |  |  |  |

# CAUSAL FACTOR: <br> Vehicle Speed - Speed and Alcohol <br> ROADSIDE DEPARTURE: Left 

The subject vehicle was traveling on a dark but lit, dry, four-lane, divided, asphalt roadway which was bounded on both sides by 13 m high curbs. The vehicle was traveling westbound in the right (curb) lane at a high rate of speed when it veered to the left and crossed the left lane, the paved median, the eastbound lanes and mounted the curb continuing across the 1.5 m sidewalk and striking a 0.9 m high concrete wall with its frontal plane. The vehicle subsequently rotated counter clockwise and struck the concrete wall a second time with its right rear fender corner. It continued to rotate in a counterclockwise rotation and rebounded from the wall to final rest on the roadway. The driver's BAC was 0.10 . In both directions of travel, the lanes were marked by broken white lane lines which were in new condition. The paved flush median was striped with a solid yellow line and an interior broken yellow line to provide a two way, left turn channelization configuration. The yellow lines were in new condition. The causal factors were vehicle speed and alcohol consumption.
PSU No. 45 Cose Number - Strotum


CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Vehicle Speed - Speed and Driver Inexperience
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-3-93 | Weather: | Clear/Cloudy |
| Time: | 1045 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 0 (0) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 17 | Year: | 1989 |
| Driver Sex: | Female | Vehicle Make: | Ford |
| Impairment: | None | Vehicle Model: | Mustang/ Mustang II |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 2 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $64 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Steering right |  |  |  |
| GV64: 10 Turning left |  |  |  |
| GV65: 13 This vehicle traveling off the |  | road on the right side |  |
| GV66: 1 Tracking |  |  |  |
| GV67: 4 Vehicle departed roadway |  |  |  |

CAUSAL FACTOR: Vehicle Speed - Speed and Driver InexperienceROADSIDE DEPARTURE:Right

The subject vehicle was traveling on a dry, asphalt road surface with a $-3 \%$ slope, solid white road edgelines and full barrier yellow centerlines in new condition. The driver was stopped at the stop sign in a T-intersection and proceeded to accelerate while making a left turn. The vehicle fishtailed and the driver steered off the right side of the road. A paved shoulder 0.5 m wide, adjacent to the travel lane, was abutted by an area of undergrowth vegetation estimated at 15 m wide. This was followed by a high cliff. The causal factor was driver inexperience with vehicle speed.


## Vehicle Dynamic Scenario



## CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 7-7-93 | Weather: | Clear/Cloudy |
| Time: | 0428 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Artificial lighting |
| Accident Severity: | 4 (K) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 20 | Year: | 1982 |
| Driver Sex: | Female | Vehicle Make: | Ford |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Mustang/ <br> Mustang II |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $80 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions |  |  |  |
| GV64: 13 Negotiating a curve |  |  |  |
| GV65: 13 This vehicle traveling off the edge of the road on the right side |  |  |  |
| GV66: 0 No avoidance maneuver |  |  |  |
| GV67: $\quad 0 \quad$ No avoidance maneuver |  |  |  |


| CAUSAL FACTOR: | Vehicle Speed - Speed and Alcohol |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was traveling westbound on a dry, dark but lit, asphalt roadway surface with a $-6 \%$ slope and superelevated at an estimated $0.7 \%$. The vehicle exited the right side of the roadway in a left curve segment, traveled across the 0.5 m wide paved shoulder, and struck a utility pole located 4 m from the roadway edge line. The vehicle's off roadway travel distance was estimated at 35 m . The four travel lanes were well defined by solid white edgelines, broken white lane lines and full barrier yellow centerlines. The driver was traveling at a high rate of speed while under the influence of alcohol ( $\mathrm{BAC}=0.17$ ). The causal factor was the vehicle's speed in combination with the driver's alcohol consumption.



| CAUSAL FACTOR: | Vehicle Speed - Unsafe Driving Act |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 8-2-93 | Weather: | Clear/Cloudy |
| Time: | 1926 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 30 | Year: | 1985 |
| Driver Sex: | Male | Vehicle Make: | Chevrolet |
| Impairment: | None | Vehicle Model: | Camaro |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 2 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 08 Braking and steering left |  |  |  |
| GV64: 01 Going straight |  |  |  |
| GV65: 13 This vehicle traveling off the edge of the road on the right side |  |  |  |
| GV66: 2 Skidding longitudinally - less than 30 degrees rotation |  |  |  |
| GV67: 4 Vehicle departed roadway |  |  |  |

# CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Right <br> <br> \section*{Vehicle Speed - Unsafe Driving Act} 

 <br> <br> \section*{Vehicle Speed - Unsafe Driving Act}}

The subject vehicle was traveling during daylight hours on a dry, two-lane, undivided, asphalt roadway where both roadway edges were bounded by a 10 cm high curb. The vehicle had just traveled down a $-7 \%$ slope segment of the roadway and began to ascend a $+6 \%$ segment when it departed the right side of the roadway and traveled 12 m on the grass surface adjacent to the curb and struck a utility pole with the frontal plane. Neighbors in the area told police the driver had been speeding earlier in the day. The causal factor was reckless driving with speed being the primary factor. A line of utility poles located adjacent to the curb was noted as an obstacle which would impede vehicle recovery attempts. The pole spacing was estimated at approximately 30 m apart.
PSU No. 45 Cose Number - Strotum 183 K

Vehicle Dynamic Scenario


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CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Right
```

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $\begin{aligned} & 8-7-93 \\ & 0134 \end{aligned}$ <br> Control/Traction Loss $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> None <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 21 <br> Male <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 3 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1981 <br> Toyota <br> Celica <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $64 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 13 Negotiating a curve <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Vehicle Speed - Speed and Alcohol <br> Right

The subject vehicle was traveling on a dry, two-lane, undivided, asphalt roadway. The vehicle departed the right roadway edge in a left curve segment and struck a utility pole. The vehicle then rotated in a counterclockwise direction and struck a tree with its right side plane. The driver was under the influence of alcohol and was traveling too fast through the curve. The road was dark with no streetlight illumination. The roadway edgelines were new white solid lines and the centerline was also new yellow barrier lines. There were three occupants in the vehicle.



| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Same Travel Direction |
| ROADSIDE DEPARTURE: | Right |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 8-2-93 <br> 0411 <br> Avoid Collision $3(\mathrm{~A})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> None <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 18 <br> Male <br> None <br> No <br> 2 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1986 <br> Chrysler <br> Newport/ <br> 5th Avenue <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Physical barrier <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $80 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Steering right <br> GV64: 16 Successful avoidance of previous event <br> GV65: 60 Other vehicle encroaching into lane from adjacent lane (same direction) over left lane line <br> GV66: 1 Tracking <br> GV67: 4 Vehicle departed roadway |  |  |  |

# CAUSAL FACTOR: <br> Evasive Maneuver - Vehicle Encroaching into Lane Same Travel Direction 

ROADSIDE DEPARTURE: Right

The subject vehicle was traveling on a dry, unlit, four-lane, divided, asphalt roadway during the evening hours. The roadway curved to the right and had an estimated $+4 \%$ slope. The driver apparently exited the roadway to the right in an attempt to avoid a vehicle which was encroaching into the travel lane from the left lane. The vehicle struck a large rock in the emergency lane, went out of control and struck a rock cliff. The area adjacent to the right travel lane consisted of a 3 m wide asphalt shoulder classified by the police as an emergency lane. This was followed by a 1.5 m wide concrete sidewalk which ended at the rock cliff. A 0.9 m wide band of rumble grooves were located on the emergency lane adjacent to the right roadway edgeline. The causal factor was vehicle encroachment into lane from same travel direction.
PSU No. 45

Vehicle Dynamic Scenario


| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Other |
| ROADSIDE DEPARTURE: | Right |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-1-93 | Weather: | Rain |
| Time: | 2350 | Surface Condition: | Wet |
| Accident Type: | Control/Traction Loss | Lighting: | None |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 30 | Year: | 1991 |
| Driver Sex: | Male | Vehicle Make: | Ford |
| Impairment: | None | Vehicle Model: | Taurus |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 3 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 09 Brak <br> GV64: 16 Succ <br> GV65: 71 Othe <br> GV66: 1 Trac <br> GV67: 4 Veh | g and steering right <br> ssful avoidance of previo vehicle encroaching into ing <br> le departed roadway | driveway, turning into op | osite direction |



The subject vehicle was traveling along a two-lane roadway in a residential area. A second vehicle backed out of a driveway. The driver performed an avoidance maneuver, exited the roadway on the right, and ran into a culvert.



Controlled /
Uncontrolled - Tracking
Brake
$\begin{array}{cc}\text { Driver } & \text { Off-Road } \\ \text { Response } & \text { Dynamic State }\end{array}$


Movement

Return to Roadway
 Resolution $\xrightarrow{ }$

Roadway
Departure Crash

Frontal Impact/ Rollover

CAUSAL FACTOR: Driver Inattention
ROADSIDE DEPARTURE: Right


# CAUSAL FACTOR: Driver Inattention <br> ROADSIDE DEPARTURE: Right 

The subject vehicle was traveling along a two-lane roadway in a residential area. The driver rounded a curve well below the area speed limit and started to look for something in the passenger compartment. The vehicle left the road on the right side and struck a post box stand.

## ACCIDENT COLLISION DIAGRAM




| CAUSAL FACTOR: | Vehicle Speed - Speed and Alcohol |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 2-3-93 | Weather: | Clear/Cloudy |
| Time: |  | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 0 (0) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity <br> with Road: <br> No. of Occupants: | 39 | Year: | 1977 |
|  | Male | Vehicle Make: | Ford |
|  | Intoxicated (alcohol/drugs) | Vehicle Model: | F-series pickup |
|  | Yes | ABS: | No |
|  | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 03 Brak <br> GV64: 13 Neg <br> GV65: 12 This <br> GV66: 2 Skid <br> GV67: 4 Veh | ing (lockup) <br> iating a curve <br> vehicle traveling off the ed <br> ing longitudinally - less <br> le departed roadway | oad on the left side rees rotation |  |

CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: ..... Left

The subject vehicle was traveling along a two-lane winding road at $113 \mathrm{~km} / \mathrm{h}(70 \mathrm{mph})$ in a $76 \mathrm{~km} / \mathrm{h}$ ( 45 mph ) speed zone. The driver lost control and exited the roadway on the left side. The vehicle hit a tree and rolled over. The driver had consumed alcohol.
CSU No. 48


```
CAUSAL FACTOR: Lost Directional Control
ROADSIDE DEPARTURE: Left
```



## CAUSAL FACTOR: Lost Directional Control <br> ROADSIDE DEPARTURE: Left

The subject vehicle was proceeding along a dark, two-lane urban roadway with no streetlights. The vehicle hit a patch of water and proceeded to hydroplane. The driver was unable to control the vehicle and exited the roadway on the left side. The vehicle impacted the left guardrail and rebounded back to the right lane.
PSU No. 48 Cose Number - Strotum

Vehicle Dynamic Scenario


CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> AccIdent Severlty: | 2-7-93 <br> 0400 <br> Drive Off Road $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Wet <br> None <br> Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 37 <br> Male <br> Intoxicated (alcohol/drugs) <br> Yes <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1985 <br> Ford <br> Escort/EXP <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Level <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 13 Neg <br> GV65: 13 This <br> GV66: 0 No <br> GV67: 0 No | oidance actions iating a curve ehicle traveling off oidance maneuver oidance maneuver | oad on the right side |  |

## CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated

ROADSIDE DEPARTURE: Right

The subject vehicle was traveling along a wet, unlit, two way, rural roadway. The driver fell asleep at the wheel. The vehicle exited the right side of a large radius left turn, hit a small depression in the road, proceeded up a crossing road embankment and became airborne. The vehicle struck a pole and a sign. The driver of the vehicle had been drinking heavily.


| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Opposite Travel Direction |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 2-2-93 | Weather: | Clear/Cloudy |
| Time: | 1510 | Surface Condition: | Dry |
| Accident Type: | Avoid Collision | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 16 | Year: | 1982 |
| Driver Sex: | Male | Vehicle Make: | Chevrolet |
| Impairment: | None | Vehicle Model: | C, K, R, V-series |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 3 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 08 Brak <br> GV64: 16 Suc <br> GV65: 62 Oth <br> GV66: 2 Skid <br> GV67: 4 Veh | ng and steering left ssful avoidance of vehicle encroachin ing longitudinally le departed roadwa | opposite direction over rees rotation | lane line |

## CAUSAL FACTOR: <br> Evasive Maneuver - Vehicle Encroaching into Lane Opposite Travel Direction <br> ROADSIDE DEPARTURE: <br> Left

The subject vehicle was proceeding in a southerly direction on a dry, straight, two-lane, rural asphalt roadway with $a+2 \%$ slope during daylight hours. The driver had just exited a curve to the right when a northbound non-contact vehicle made a left turn (across the subject vehicle's path of travel into a private driveway). The subject driver steered to the left to avoid the turning vehicle, applied heavy brake pedal pressure, and attempted to steer back to the right to remain on the roadway. The subject vehicle exited the left edge of the roadway in a clockwise yaw. The vehicle's front bumper struck a mailbox (uprooted) and the vehicle then skidded across a driveway and struck a tree with its left front fender and door. The subject vehicle rotated counterclockwise around this tree and came to rest facing in a south southeasterly direction. The roadway had edge lines and full barrier center lines.


Vehicle Dynamic Scenario


| CAUSAL FACTOR: | Driver Relinquishes Steering Control - Physical <br> (seizure/passed out) |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 2-3-93 <br> 2030 <br> Drive Off Road <br> 3 (A) | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> None <br> Rural |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Famillarity with Road: <br> No. of Occupants: | 60 <br> Male <br> Physical <br> (seizure/passed out) <br> Yes | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1976 <br> Chevrolet <br> C, K, R, V-series <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No av <br> GV64: 01 Going <br> GV65: 12 This <br> GV66: 0 No av <br> GV67: 0 No av | oidance actions <br> straight <br> ehicle traveling off the <br> oidance maneuver <br> oidance maneuver | oad on the left side |  |


| CAUSAL FACTOR: | Driver Relinquishes Steering Control - Physical <br> (seizure/passed out) |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |

The subject vehicle was proceeding in a south southwesterly direction on a dry, two-lane, rural, asphalt roadway. The driver blacked-out, relinquishing steering control. The vehicle drifted to the left and exited the left edge of the roadway in a tracking mode. After departing the roadway, the left front fender of the vehicle sideswiped a tree located approximately 3 m off the roadway. The vehicle continued forward in a tracking attitude, entered a gully, and came to rest against several small trees. The total distance traveled from the point of exit to final rest was approximately 40 m . The roadway had a negative slope and no surface markings.

ACCIDENT COLLISION DIAGRAM

| Cose Number - Strotum 043K |  | Indicote North |
| :---: | :---: | :---: |
|  |  |  <br> 1 1 1 1 1 1 1 1 |

Vehicle Dynamic Scenario

Return to

Roadway $\quad$\begin{tabular}{c}
$\downarrow$ <br>
Resolution

 

Roadway <br>
Departure <br>
Crash

$\quad$

Side Impact// <br>
Frontal Impact
\end{tabular}

## CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $\begin{aligned} & 2-6-93 \\ & 0450 \end{aligned}$ <br> Control/Traction Loss $3(\mathrm{~A})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> None <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Famillarity with Road: <br> No. of Occupants: | 36 <br> Male <br> Other (alcoh. consumption <br> - BAC unknown) <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1986 <br> Chevrolet $\mathrm{S}-10, \mathrm{~T}-10$ <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> 64 km/h |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 13 Negotiating a curve <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

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CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE:
```

Vehicle Speed - Speed and Alcohol
Right

The subject vehicle was traveling north on a dry, two-lane, undivided, asphalt roadway with a $+4 \%$ slope. The driver failed to negotiate a left curve which had a crowned road profile and departed the right road edge. The driver steered to the left in an attempt to return to the travel lane causing the vehicle to rotate in a counterclockwise direction and travel across the roadway. The vehicle then exited the left side of the roadway and rolled over striking two trees. The roadway was unlighted with no painted roadway edge lines or center lines. The causal factor was driver lost control of vehicle due to speed in a curve with alcohol consumption as a contributory factor.
PSU No. 48 Cose Number - Strotum O44K


CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE:

Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 4-7-93 <br> 0210 <br> Control/Traction Loss $3(\mathrm{~A})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> None <br> Rural |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 44 <br> Female <br> Other (alcoh. consumption <br> - BAC unknown) <br> Unknown <br> 2 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1972 <br> Pontiac <br> LeMans/ <br> Tempest <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided $2$ | Allgnment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 09 Turning right <br> GV65: 11 This vehicle traveling over the lane line on right side of travel lane <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

## CAUSAL FACTOR: ROADSIDE DEPARTURE: <br> Vehicle Speed - Speed and Alcohol <br> Right

The subject vehicle was traveling on a dry, two-lane, undivided, asphalt roadway with a $-3 \%$ slope during dark hours with no street light illumination. The driver lost control of the vehicle in a left curve and departed the right road edge. The driver then steered to the left and crossed over the roadway striking a ditch after departing the left road edge. Before losing control of the vehicle, the driver completed a right turn from a three leg intersection and was apparently accelerating at the time of control loss. The driver had consumed alcohol prior to the accident. The roadway was not marked with painted edge lines or center lines and there were no reflective markers. The causal factor was loss of control due to speed in a curve with alcohol consumption as a contributing factor.



## CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol <br> ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $\begin{aligned} & 3-1-93 \\ & 1910 \end{aligned}$ <br> Control/Traction Loss $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> None <br> Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 27 <br> Male <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 2 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1974 <br> Oldsmobile <br> Cutlass <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Level <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 13 Negotiating a curve <br> GV65: 12 This vehicle traveling off the edge of the road on the left side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |



The subject vehicle was traveling on a dry, level, two-lane, undivided, asphalt roadway during the night time hours with no overhead roadway illumination. The vehicle exited the left road edge on a left curve and struck a utility pole with the right front fender. The driver was cited for DWI ( $\mathrm{BAC}=0.11$ ) and was traveling too fast for the curve. The white edge line and the yellow full barrier center lines were in new condition. There were no sight line restrictions or roadway obstacles present prior to the roadway departure. The causal factor was loss of control due to speed in a curve with intoxication as a contributory factor.

## ACCIDENT COLLISION DIAGRAM



## Vehicle Dynamic Scenario



```
CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE:Left
```

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 4-6-93 | Weather: | Rain |
| Time: | 0120 | Surface Condition: | Wet |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 4 (K) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 34 | Year: | 1983 |
| Driver Sex: | Male | Vehicle Make: | Buick |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Skylark |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Allgnment: | Curve Left |
|  | 2 | Speed Limit: | $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions |  |  |  |
| GV64: 13 Negotiating a curve |  |  |  |
| GV65: 12 This vehicle traveling off |  | ad on the left side |  |
| GV66: 0 No | avoidance maneuver |  |  |
| GV67: 0 No | avoidance maneuver |  |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: Left

The subject vehicle was proceeding in a northerly direction around a right curve on a dark and unlit, wet, two-lane, rural asphalt roadway with edge lines and full barrier center lines. The vehicle failed to track a curve to the right, exiting the left edge of the roadway in tracking attitude with no evidence of braking. Approximately 50 m after leaving the roadway, the right side of the vehicle struck a utility pole located approximately 2.6 m off the roadway. The vehicle rotated in a clockwise direction around the utility pole and came to rest facing in a south southwesterly direction approximately 6 m beyond the pole. The driver was intoxicated ( $\mathrm{BAC}=0.24$ ) and was traveling at a speed which was too fast for conditions.

ACCIDENT COLLISION DIAGRAM



CAUSAL FACTOR: Lost Directional Control
ROADSIDE DEPARTURE:

Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 4-3-93 | Weather: | Rain |
| Time: | 1555 | Surface Condition: | Wet |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 30 | Year: | 1991 |
| Driver Sex: | Female | Vehicle Make: | Nissan/Datsun |
| Impairment: | Unknown | Vehicle Model: | 810/Maxima |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 3 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: | Straight <br> Grade |
| No. of Lanes: | 2 | Speed Limit: | $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions |  |  |  |
| GV64: 02 Slowing or stopping in traffic lane |  |  |  |
| GV65: 05 This vehicle loss of control due to poor road conditions |  |  |  |
| GV66: 0 No avoidance maneuver |  |  |  |
| GV67: 0 No avoidance maneuver |  |  |  |

## CAUSAL FACTOR: Lost Directional Control

ROADSIDE DEPARTURE: Right

The subject vehicle was proceeding over a hillcrest in a westerly direction on a wet, two-lane, rural asphalt roadway with a $+2 \%$ slope, edge lines, and a partial barrier center line. The driver approached the hillcrest, applied brake pedal pressure to decelerate and lost control on the wet road surface. The vehicle rotated counterclockwise and entered a broadside skid to the right. The vehicle exited the left edge of the roadway in a broadside attitude, skidded across a private driveway, entered a shallow drainage ditch, and then rolled side-over-side to the right 1.5 times. The vehicle came to rest on its top, in the ditch, facing a southerly direction.
PSU No. 48 Cose Number - Strotum 085C


CAUSAL FACTOR: Driver Inattention

ROADSIDE DEPARTURE:

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 4-3-93 | Weather: | Clear/Cloudy |
| Time: | 0500 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 20 | Year: | 1981 |
| Driver Sex: | Male | Vehicle Make: | Chevrolet |
| Impairment: | None | Vehicle Model: | Caprice/Impala |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions |  |  |  |
| GV64: 13 Negotiating a curve |  |  |  |
| GV65: 12 This vehicle traveling off |  | oad on the left side |  |
| GV66: 0 No avoidance maneuver |  |  |  |
| GV67: 0 No avoidance maneuver |  |  |  |

## CAUSAL FACTOR: Driver Inattention <br> ROADSIDE DEPARTURE: Left

The subject vehicle was traveling in a southeasterly direction on a dry, two-lane, rural, asphalt roadway with a $+4 \%$ slope, no surface markings, and a sharp curve to right. As the road curved to the right, the driver continued straight forward. The vehicle exited the left edge of the roadway in a tracking attitude with no evidence of braking. Approximately 15 m after leaving the roadway, the vehicle vaulted an 18 m wide ravine and struck the far wall of the ravine embankment with its frontal structure. The vehicle came to rest at the point of impact facing an east southeasterly direction. The causal factor was driver inattentive to the driving task.
PSU No. 48 Cose Number - Strotum 087 K


CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 4-4-93 <br> 2010 <br> Control/Traction Loss $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Artificial lighting <br> Urban |
| Driver/Occupant Information |  | Vehicle Info | mation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 52 <br> Male <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 2 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | Chevrolet <br> Lumina <br> Unknown <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Flush or curb <br> 5 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $80 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 09 Braking and steering right <br> GV64: 01 Going straight <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 3 Skidding laterally - clockwise rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |


| CAUSAL FACTOR: | Vehicle Speed - Speed and Alcohol |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was traveling in a southerly direction in the second southbound lane of a straight, dry and lighted, multi-lane, divided, urban, asphalt, roadway with a $-2 \%$ slope. A southbound non-contact vehicle traveling in an inboard lane attempted to merge to the right into the an adjacent lane. The subject driver steered sharply to the right. The vehicle rotated clockwise and entered a broadside skid with the left side leading. The vehicle exited the right edge of the roadway and struck a light standard with its left C-pillar area. The investigating officer noted that the subject driver was intoxicated and was traveling at an estimated speed of $113 \mathrm{~km} / \mathrm{h}(70 \mathrm{mph})$ in a $80 \mathrm{~km} / \mathrm{h}(50 \mathrm{mph})$ speed zone. The roadway consisted of five lanes with two left turn lanes.
PSU No. 48 Cose Number - Strotum 0890


CAUSAL FACTOR: Evasive Maneuver - Avoid Animal or Pedestrian ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 5-1-93 | Weather: | Clear/Cloudy |
| Time: | 1655 | Surface Condition: | Dry |
| Accident Type: | Avoid Collision | Lighting: | Daylight |
| Accident Severlty: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 29 | Year: | 1976 |
| Driver Sex: | Female | Vehicle Make: | Oldsmobile |
| Impairment: | None | Vehicle Model: | Cutlass |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: | Straight <br> Grade |
|  |  | Speed Limit: | $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 09 Braking and steering right |  |  |  |
| GV64: 01 Going straight |  |  |  |
| GV65: 87 Animal in roadway |  |  |  |
| GV66: 1 Tracking |  |  |  |
| GV67: 4 Vehicle departed roadway |  |  |  |


| CAUSAL FACTOR: | Evasive Maneuver - Avoid Animal or Pedestrian |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was traveling in an easterly direction on a dry, straight, two-lane, rural, asphalt roadway. A dog entered the roadway, forward of the vehicle, and began crossing from the driver's right to the driver's left. The driver steered sharply to the right in an evasive maneuver. The vehicle rotated clockwise and entered a broadside skid to the left with the left side leading. The vehicle exited the right edge of the roadway, entered a drainage ditch, struck the far wall of the ditch with its frontal structure, and then rolled side-over-side to the left. The vehicle rolled once and then came to rest on its wheels, facing in an east southeasterly direction. The roadway had no surface markings. The vehicle was traveling at a police estimated speed of $72 \mathrm{~km} / \mathrm{h}$ ( 45 mph ).

## ACCIDENT COLLISION DIAGRAM




CAUSAL FACTOR:
ROADSIDE DEPARTURE:

## Driver Inattention

## Right

## General Accident Information

Date: 5-6-93 Weather: Clear/Cloudy

Time: 1412
Accident Type: Drive Off Road
Accident Severity: 3 (A)
Weather:
Dry
Surface Condition: Dry
Lighting: Daylight
Land Use:
Rural

| Driver/Occupant Information |  | Vehicle Information |  |
| :---: | :---: | :---: | :---: |
| Driver Age: | 43 | Year: | 1991 |
| Driver Sex: | Male | Vehicle Make: | Nissan/Datsun |
| Impairment: | None | Vehicle Model: | Pickup |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: | Straight <br> Grade |
| No. of Lanes: | 2 | Speed Limit: | $89 \mathrm{~km} / \mathrm{h}$ |

## Cluster Variables

GV14:
01 No avoidance actions
GV64: 01 Going straight
GV65: 13 This vehicle traveling off the edge of the road on the right side
GV66: 0 No avoidance maneuver
GV67: $0 \quad$ No avoidance maneuver

## CAUSAL FACTOR: Driver Inattention

ROADSIDE DEPARTURE: Right

The subject vehicle was traveling southbound on a straight, dry, undivided, two-lane, asphalt roadway with a $-4 \%$ slope. The driver reached for a package of chewing tobacco, steered right and departed the right roadway edge, striking the down turned end of a W-beam guardrail. The vehicle continued over the guardrail and impacted a tree with its right side. The road markings consisted of solid white edge lines and yellow center lines which were in new condition. There were no sight line restrictions or obstacles in the roadway prior to roadway departure which occurred during daylight hours. The causal factor was driver inattentive to driving task.
CSU No. 48


CAUSAL FACTOR: Vehicle Speed-Speed and Alcohol
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | $\begin{aligned} & 5-7-93 \\ & 1858 \end{aligned}$ <br> Control/Traction Loss $4(\mathrm{~K})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Daylight <br> Rural |
| Driver/Occupant Information |  | Vehicle Info | mation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 22 <br> Male <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 3 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1976 <br> Buick <br> LeSabre <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
|  | oidance actions <br> iating a curve vehicle traveling off the oidance maneuver oidance maneuver | oad on the right side |  |

## CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol <br> ROADSIDE DEPARTURE:

The subject vehicle was traveling southbound around a left hand curve on a dry, two-lane, undivided, asphalt roadway with a $+2 \%$ slope. The vehicle departed the right roadway edge, traveled along the grassy shoulder and re-entered the roadway. It then departed the right side of the roadway and struck a tree with its left side plane and rolled over. There were no roadway edge lines or center lines present and no reflective delineators or roadway markers. There were no sight line restrictions or obstacles in the roadway prior to roadway departure which occurred during daylight hours. The driver was intoxicated $(B A C=0.28)$ and traveling at $145 \mathrm{~km} / \mathrm{h}(90 \mathrm{mph})$. The causal factor was driver lost control of the vehicle as the result of high speed in a curve with alcohol consumption as a contributing factor.



## CAUSAL FACTOR: <br> Vehicle Failure <br> ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 6-1-93 | Weather: | Clear/Cloudy |
| Time: | 1010 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 46 | Year: | 1986 |
| Driver Sex: | Female | Vehicle Make: | Lincoln |
| Impairment: | None | Vehicle Model: | Continental/ <br> Town Car |
| Familiarity with Road: | Unknown | ABS: |  |
| No. of Occupants: | 9 | Defects: | Tire Blowout |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $105 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 02 Braking (no lockup) |  |  |  |
| GV64: 05 Passing or overtaking another vehicle |  |  |  |
| GV65: 01 This vehicle loss of control due to blow out or flat tire |  |  |  |
| GV66: 1 Tracking |  |  |  |
| GV67: 4 Vehicle departed roadway |  |  |  |

CAUSAL FACTOR: Vehicle Failure
ROADSIDE DEPARTURE:

Right

The subject vehicle was traveling southbound on a dry, four-lane, divided, concrete roadway, with a $-2 \%$ slope. The vehicle veered to the right when the right front tire experienced an "air out" event, departed the right roadway edge line, and struck a bridge rail with the right frontal plane. The vehicle rotated in a clockwise direction and subsequently struck another vehicle traveling in the same direction. It continued along the right emergency lane/shoulder striking the bridge rail a second time. The weather was clear during daylight hours with no roadway obstacles or hazards noted. The driver had the cruise control set and activated at $105 \mathrm{~km} / \mathrm{h}(65 \mathrm{mph})$. The causal factor was vehicle failure involving a tire blow out.

## ACCIDENT COLLISION DIAGRAM

PSU No. 48



CAUSAL FACTOR: Lost Directional.Control
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 6-1-93 | Weather: | Clear/Cloudy |
| Time: | 1140. | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 0 (0) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 50 | Year: | 1992 |
| Driver Sex: | Female | Vehicle Make: | Dodge |
| Impairment: | None | Vehicle Model: | Dakota |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Flush or curb | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $105 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions |  |  |  |
| GV64: 14 Changing lanes |  |  |  |
| GV65: 13 This vehicle traveling off the |  | oad on the right side |  |
| GV66: 0 No | oidance maneuver |  |  |
| GV67: 0 No | oidance maneuver |  |  |

## CAUSAL FACTOR: Lost Directional Control <br> ROADSIDE DEPARTURE: Right

The subject vehicle was traveling east on a dry, straight, four-lane, divided, asphalt interstate road with a $-1 \%$ slope. The driver initiated a change to the adjacent left lane, decided to return to the same right lane, and lost control of the vehicle. The vehicle rotated clockwise and departed the right road edge, crossing the asphalt shoulder and striking a guardrail with the left rear side plane. The vehicle was redirected and came to final rest on the shoulder facing in the opposite direction. The accident occurred during daylight hours. There were no sight line limitations, roadway hazards, or obstacles. The causal factor was the driver attempted to change lanes and lost control of the vehicle.
PSU No. 48

Vehicle Dynamic Scenario


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $\begin{aligned} & 6-3-93 \\ & 0330 \end{aligned}$ <br> Control/Traction Loss $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> None <br> Rural |
| Driver/Occup | nt Information | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 18 <br> Female <br> Fell Asleep <br> Unknown <br> 2 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1987 <br> Ford <br> Ranger <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Physical barrier <br> 4 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $105 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 12 This vehicle traveling off the edge of the road on the left side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

# CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Right <br> <br> \section*{Driver Relinquishes Steering Control - Fell Asleep} 

 <br> <br> \section*{Driver Relinquishes Steering Control - Fell Asleep}}

The subject vehicle was traveling westbound on a dry, level, four-lane, divided, asphalt interstate roadway. The driver fell asleep, departed the right road edge, and traveled a short distance on the asphalt shoulder. The driver awoke and over-steered to the left, crossing the two travel lanes, and departing the left side of the roadway in a counterclockwise rotation. The vehicle traveled down a $-2 \%$ embankment cross slope, struck a tree, rolled over, and caught on fire. The roadway departure occurred during the evening hours with no overhead roadway illumination present. There were no sight line restrictions or roadway obstacles. The right roadway edge line was a solid white line in good condition. There were no reflective roadside delineators; however, reflective road markers were present along the lane lines. The causal factor was driver relinquished control of the vehicle due to falling asleep.
PSU No. 48 Cose Number - Stroum


| CAUSAL FACTOR: | Lost Directional Control |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 9-5-93 <br> 1715 <br> Contro/Traction Loss $0(0)$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Rain <br> Wet <br> Daylight <br> Rural |
| Driver/Occup | nt Information | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 19 <br> Female <br> None <br> Yes <br> 2 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1979 <br> Chevrolet <br> Malibu/Chevelle <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Steering right <br> GV64: 13 Negotiating a curve <br> GV65: 06 This vehicle loss of control due to traveling too fast for conditions <br> GV66: 4 Skidding laterally - counterclockwise rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |

## CAUSAL FACTOR: Lost Directional Control

## ROADSIDE DEPARTURE: <br> Right

The subject vehicle was proceeding through rain in a northerly direction on a wet, two-lane, rural roadway and was negotiating a curve to the left with a $-4 \%$ slope. The driver lost directional control on the wet surface, and after a series of overcorrections, the vehicle rotated counterclockwise and exited the right edge of the roadway, skidding backwards. The vehicle skidded down an embankment with a $-10 \%$ slope and came to rest straddling a hedge located at the bottom of the embankment. Both edges of the roadway were delineated by edge lines in good condition, and lane separation was provided by full barrier center lines which were also in good condition. The only vehicle damage sustained during this sequence was a flat rear tire.

## ACCIDENT COLLISION DIAGRAM

PSU No. 48 Cose Number - Strotum 192 H


CAUSAL FACTOR:
ROADSIDE DEPARTURE:

## Lost Directional Control

Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $\begin{aligned} & 1-7-93 \\ & 0025 \end{aligned}$ <br> Control/Traction Loss $4(\mathrm{~K})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Rain <br> Wet <br> Artificial lighting <br> Urban |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 18 <br> Male <br> Intoxicated (alcohol/drugs) <br> Yes <br> 4 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1979 <br> Oldsmobile <br> Cutlass <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Flush or curb <br> 3 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 01 Goin <br> GV65: 06 This <br> GV66: $\quad 0 \quad$ No <br> GV67: $\quad 0$ No | oidance actions <br> straight <br> vehicle loss of control <br> oidance maneuver <br> oidance maneuver | too fast for conditions |  |

## CAUSAL FACTOR:

ROADSIDE DEPARTURE:

## Lost Directional Control

Right

The subject vehicle was traveling through rain in an easterly direction in the first, eastbound travel lane of a wet, six-lane, divided roadway. As the vehicle traversed and exited a curve to the right and then entered a straight section with $-3 \%$ slope, the subject driver lost directional control on the wet road surface. The vehicle exited the right edge of the roadway and sideswiped a utility pole located 0.9 m beyond the south edge of the roadway with its right side. The vehicle rotated clockwise off the utility pole and came to rest in the roadway, facing northwest. The driver was intoxicated and was exceeding the speed limit. The loss of control was related to the driver's intoxication, the curve, and to the vehicle's travel speed.

## ACCIDENT COLLISION DIAGRAM

PSU No. 49 Cose Number - Stratum OO1B


```
CAUSAL FACTOR: Vehicle Speed - Other
ROADSIDE DEPARTURE: Left
```

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 1-3-93 <br> 2035 <br> Drive Off Road $0(\mathrm{O})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Wet <br> Artificial lighting <br> Urban |
| Driver/Occup | nt Information | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 23 <br> Male <br> None <br> No <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1993 <br> Ford <br> Crown Victoria <br> Yes <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 1 | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Level <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 13 Neg <br> GV65: 12 Thi <br> GV66: 0 No <br> GV67: 0 No | oidance actions iating a curve vehicle traveling off oidance maneuver oidance mancuver | oad on the left side |  |

# CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: Left 

The subject vehicle was traveling through rain on a wet, one-lane, right curved, level, concrete, interstate exit ramp. The driver attempted to exit the interstate on a connecting loop ramp to another interstate, but was unfamiliar with the area and was traveling too fast. The vehicle departed the left road edge, and struck a guardrail. The roadway departure occurred during evening hours, but the ramp was illuminated by overhead lights. The left road edge was defined by a solid yellow line and the right road edge was defined by a solid white line. The causal factor was vehicle speed to fast for conditions and driver unfamiliarity with the roadway.

ACCIDENT COLLISION DIAGRAM



| CAUSAL FACTOR: | Lost Directional Control |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $\begin{aligned} & 1-1-93 \\ & 2326 \end{aligned}$ <br> Control/Traction Loss $0 \text { (0) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Rain <br> Ice/Snow <br> Artificial lighting <br> Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Famillarity with Road: <br> No. of Occupants: | 47 <br> Male <br> None <br> Unknown <br> 3 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1968 <br> Ford <br> Mustang/ <br> Mustang II <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 3 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No a <br> GV64: 02 Slow <br> GV65: 05 This <br> GV66: 0 No a <br> GV67: 0 No a | oidance actions <br> ng or stopping in traffic vehicle loss of control due oidance maneuver oidance maneuver | conditions |  |


| CAUSAL FACTOR: | Lost Directional Control |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was traveling north on an icy, three-lane, undivided, concrete roadway with a $-2 \%$ slope. The driver attempted to avoid another vehicle by applying the brakes, skidded on the road surface, departed the right side of the roadway by jumping the 10 cm high curb, and struck a street sign located on the sidewalk with the left side plane. The roadway was illuminated by overhead street lights and there were no sight line restrictions; however, the driver crossed a set of railroad tracks just prior to the roadway departure which occurred during evening hours. The causal factor was driver lost directional control on an icy road surface.



| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Same Travel Direction |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $1-4-93$ $2020$ <br> Avoid Collision $2 \text { (B) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Artificial lighting <br> Rural |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 20 <br> Female <br> None <br> Unknown <br> 4 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1992 <br> Saturn <br> SL <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Physical barrier $2$ | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 08 Bra <br> GV64: 01 Goi <br> GV65: 60 Oth <br> GV66: $\quad 1$ Tra <br> GV67: 4 Veh | ng and steering left straight vehicle encroaching ing <br> le departed roadway | adjacent lane (same direc | n) over left lane line |

## CAUSAL FACTOR: Evasive Maneuver - Vehicle Encroaching into Lane Same Travel Direction <br> ROADSIDE DEPARTURE: Left

The subject vehicle was proceeding in a westerly direction in the second lane of a four-lane, divided expressway. A non-contact vehicle steered left and entered the second westbound lane in front of the subject vehicle. The subject driver steered left to avoid this non-contact vehicle and exited the left edge of the roadway. The left front fender and left rear quarter panel then struck the guardrail located at the edge of the south shoulder. The subject vehicle deflected to its right, crossed the roadway again, and then struck a bridge rail located at the north edge of the adjoining exit ramp. It then continued on and was involved in a frontal impact with a sign located in the gore area between the roadway and the exit ramp.
CSU No. 49 Cose Number - Stratum


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $4-5-93$ <br> 0645 <br> Drive Off Road $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Daylight <br> Rural |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 25 <br> Male <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1987 <br> Nissan/Datsun <br> Stanza <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Flush or curb $2$ | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> 89 km/h |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 12 This vehicle traveling off the edge of the road on the left side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |


| CAUSAL FACTOR: | Driver Relinquishes Steering Control - Intoxicated |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |

The subject vehicle was traveling in a southerly direction on a two-lane ramp that connected two interstate roadways. The vehicle drifted off the left edge of the roadway while traversing a curve to the left. It then ramped over the turned down end of W-section guardrail, traveled an additional 90 m , ran through a deep rut, and then flipped end-over-end. The vehicle came to rest on its top, facing in a northerly direction. The driver was intoxicated ( $\mathrm{BAC}=0.16$ ).
PSU No. 49
Case Number - Stratum 083C Indicate North 8



## CAUSAL FACTOR: Lost Directional Control <br> ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 4-4-93 <br> 0550 <br> Control/Traction Loss <br> 1 (C) | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Rain <br> Wet <br> Daylight <br> Urban |
| Driver/Occup | nt Information | Vehicle Info | mation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 25 <br> Male <br> None <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1984 <br> Nissan/Datsun <br> Pickup <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Flush or curb <br> 4 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 08 Braking and steering left <br> GV64: 02 Slowing or stopping in traffic lane <br> GV65: 06 This vehicle loss of control due to traveling too fast for conditions <br> GV66: 4 Skidding laterally - counterclockwise rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |

# CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Lost Directional Control <br> Left 

The subject vehicle was traveling in the second northbound travel lane on a wet, seven-lane, divided, urban, concrete, roadway with a negative slope. As the vehicle approached an intersection, the traffic signal changed to red for northbound traffic. The driver braked heavily causing the vehicle to rotate counterclockwise. The vehicle skidded off the roadway to the left in a broadside skid and struck a traffic signal standard located in the median with the right rear portion of its pickup box. The vehicle rotated counterclockwise around the pole, re-entered the northbound lanes and rolled onto its left side and came to rest facing in a south southeasterly direction. The roadway had broken white lane lines and both northbound lanes were bounded by curbs.

## ACCIDENT COLLISION DIAGRAM




CAUSAL FACTOR: Vehicle Speed - Excessive
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 4-3-93 <br> 0155 <br> Control/Traction Loss $4 \text { (K) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Artificial lighting <br> Urban |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 41 <br> Male <br> None <br> Unknown <br> 2 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1989 <br> Chevrolet <br> S-10, T-10 <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 4 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Steering right <br> GV64: 01 Going straight <br> GV65: 06 This vehicle loss of control due to traveling too fast for conditions <br> GV66: 3 Skidding laterally - clockwise rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |

## CAUSAL FACTOR: Vehicle Speed - Excessive <br> ROADSIDE DEPARTURE: Right

The subject vehicle was traveling in the first eastbound travel lane on a dry, four-lane, urban, asphalt, roadway with a negative slope. The driver moved into the second eastbound lane to pass a slower moving vehicle. After passing the non-contact vehicle, the driver attempted to return to the first eastbound lane, lost directional control, yawed in a clockwise direction, and entered a broadside skid. The vehicle exited the right edge of the roadway, striking and mounting the south curb line. As the vehicle skidded down a negative-sloped embankment beyond the south sidewalk, it rolled side-over-side to the left and came to rest on its wheels in a lake, facing in a southerly direction. The right front passenger was ejected during the rollover sequence, landed in the lake and drowned. The roadway was marked with lane lines, full barrier center lines, and was lighted. The investigating officer noted that the driver was traveling at an excessive speed.



## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Vehicle Speed - Speed and Alcohol Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 4-2-93 <br> 0156 <br> Control/Traction Loss $4(\mathrm{~K})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Artificial lighting <br> Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 19 <br> Male <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 3 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1981 <br> Honda <br> Prelude <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Physical barrier <br> 3 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| $\begin{array}{lll}\text { GV14: } & 99 & \text { Unk } \\ \text { GV64: } & 01 & \text { Goin }\end{array}$ <br> GV65: 06 This <br> GV66: $\quad 9 \quad$ Prec <br> GV67: 9 Dire | wn <br> straight <br> ehicle loss of control <br> sh stability unknown <br> ional consequences unk | g too fast for conditions |  |

```
CAUSAL FACTOR:
ROADSIDE DEPARTURE: Left
```

The subject vehicle was traveling in the third northbound lane of a six-lane, divided roadway. The driver lost directional control of the vehicle which struck a concrete median barrier with its left front corner. The vehicle overrode the barrier and slid along the top of the barrier with its left side leading and rotated approximately 80 degrees clockwise to the vehicle's trajectory. The left side of the vehicle then struck a light standard mounted on top of the barrier. The vehicle split into two sections and came to rest straddling the west edge line of the roadway, upside down and facing in an easterly direction. The vehicle caught on fire and burned after coming to rest. The driver was intoxicated and traveling at an excessive speed.
PSU No. 49 Cose Number - Strotum 088B

## Vehicle Dynamic Scenario



CAUSAL FACTOR: ROADSIDE DEPARTURE:

Driver Relinquishes Steering Control - Intoxicated
Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 1-6-93 <br> 1830 <br> Avoid Collision <br> 3 (A) | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Artificial lighting <br> Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 51 <br> Male <br> Intoxicated (alcohol/drugs) <br> Yes | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1991 <br> Chevrolet <br> S-10, T-10 <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Physical barrier <br> 1 | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 08 Bra <br> GV64: 15 Me <br> GV65: 74 Oth <br> GV66: 4 Ski <br> GV67: 2 Ve | g and steering left <br> g <br> vehicle encroachin <br> ing laterally - coun <br> le stayed on roadw | entrance to limited acces tion <br> lane where avoidance m | ighway <br> uver was initiated |


| CAUSAL FACTOR: | Driver Relinquishes Steering Control - Intoxicated |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |

The subject vehicle was proceeding in a northerly direction in the fourth lane of a four-lane expressway. The subject driver moved to the left and entered a one lane entrance ramp to the express lanes. The driver stated that a non-contact vehicle from the third northbound lane, who also entered the entrance ramp, cut off the subject vehicle. The subject driver steered to the left to avoid the non-contact vehicle and struck the concrete barrier separating the express lanes from the entrance ramp. In this case it is more probable that the driver merely released steering control due to intoxication ( $\mathrm{BAC}=0.22$ ).

ACCIDENT COLLISION DIAGRAM
PSU No. 72


CAUSAL FACTOR: ROADSIDE DEPARTURE: Right

Driver Inattention

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 2-5-93 <br> 2130 <br> Drive Off Road $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Artificial lighting <br> Urban |
| Driver/Occup | nt Information | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 19 <br> Female <br> None <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1991 <br> Dodge <br> Vista Van <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 4 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 11 This vehicle traveling over the lane line on right side of travel lane <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

## CAUSAL FACTOR:

ROADSIDE DEPARTURE: Right

The subject vehicle was traveling south in the first travel lane of a four-lane, undivided, city street. The driver failed to track the transition as the roadway narrowed and the southbound lanes shifted to the left. The vehicle continued straight forward, exited the right edge of the roadway, struck a light pole located 0.6 m beyond the west curb line with its center frontal area, and came to rest at the point of impact. The subject driver was inattentive to the driving task.
PSU No. 72 Cose Number - Stratum 018 J

## Vehicle Dynamic Scenario



CAUSAL FACTOR: ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 3-4-93 <br> 0047 <br> End Departure $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Snow/Sleet/Hail Wet <br> Artificial lighting Urban |
| Driver/Occup | nt Information | Vehicle Info | mation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 31 <br> Male <br> None <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1979 <br> Pontiac <br> Bonneville/ Catalina <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 03 Braking (lockup) <br> GV64: 02 Slowing or stopping in traffic lane <br> GV65: 15 This vehicle turning left at intersection <br> GV66: 2 Skidding longitudinally - less than 30 degrees rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |


| CAUSAL FACTOR: | Vehicle Speed - Attempted to Initiate a 90 Degree Turn |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was traveling through snowy weather in a westerly direction on a wet, two-lane urban cobblestone, street. As the vehicle approached a T-intersection with a north/south roadway, the driver attempted to decelerate to initiate a left turn onto the intersecting roadway. The vehicle skidded straight forward, and struck a utility pole located at the southwest corner of the intersection. The vehicle came to rest at the point of impact, in contact with the pole, facing in a west southwesterly direction. The roadway was dark with no artificial lighting and no surface markings. The driver was traveling too fast for the wet road surface.

## ACCIDENT COLLISION DIAGRAM

PSU No. 72 Cose Number - Stratum O47K

## Vehicle Dynamic Scenario


Return to

Roadway $\quad$| Roadway |
| :---: |
| Desolution |
| Crash | Frontal Impact

| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Same Travel Direction |
| ROADSIDE DEPARTURE: | Left |

## General Accident Information

| Date: | 3-1-93 | Weather: | Clear/Cloudy |
| :---: | :---: | :---: | :---: |
| Time: | 0720 | Surface Condition: | Dry |
| Accident Type: | Avoid Collision | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 26 | Year: | 1977 |
| Driver Sex: | Male | Vehicle Make: | Chevrolet |
| Impairment: | None | Vehicle Model: | Nova |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 2 | Defects: | No |

Roadway Information

| Trafficway Type <br> (Median): | Physical barrier | Alignment: | Straight |
| :---: | :--- | :--- | :--- |
| No. of Lanes: | 3 | Slope: | Level |
|  |  | Speed Limit: | $89 \mathrm{~km} / \mathrm{h}$ |

## Cluster Variables

GV14: 06 Steering left
GV64: 01 Going straight
GV65: 61 Other vehicle encroaching into lane from adjacent lane (same direction) over right lane line
GV66: $\quad 1$ Tracking
GV67: 4 Vehicle departed roadway

| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Same Travel Direction |
| ROADSIDE DEPARTURE: | Left |

The subject vehicle was traveling in the second northbound travel lane of a six-lane, divided expressway. A non-contact vehicle traveling in the first travel lane immediately forward of the subject vehicle, started to move into lane two. The subject driver steered sharply to the left to avoid the non-contact vehicle. The non-contact driver saw the subject vehicle and returned to the first travel lane. The subject vehicle swerved across lane three and the adjacent emergency lane striking the steel W-beam median barrier with its frontal plane. The subject vehicle then slid along the barrier coming to rest with the front of the vehicle in contact with the barrier and straddling the emergency lane, facing in a westerly direction.


## Vehicle Dynamic Scenario



| CAUSAL FACTOR: | Lost Directional Control |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 3-7-93 <br> 2345 <br> Drive Off Road $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Ice/Snow <br> Artificial lighting <br> Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 21 <br> Male <br> None <br> Unknown <br> 4 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1989 <br> Pontiac <br> Grand Prix <br> (FWD) <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Flush or curb <br> 3 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Level <br> $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 03 Braking (lockup) <br> GV64: 13 Negotiating a curve <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 2 Skidding longitudinally - less than 30 degrees rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |

The subject vehicle was traveling in the first northbound lane of a snow and ice covered, seven-lane, divided, urban, asphalt, roadway. The driver lost directional control on the snow/ice covered roadway surface while negotiating a curve to the left. The vehicle skidded off the right edge of the roadway after passing through an intersection and the center frontal area struck a traffic signal support standard located on a traffic island at the northeast corner of the intersection. The vehicle rotated counterclockwise and came to rest in contact with the pole, facing in a northwesterly direction. The roadway was lighted, bounded by curbs, and the lane lines were in good condition. The northbound lanes had a $25-30 \mathrm{~cm}$ superelevation.
PSU No. 72 Cose Number - Strotum 053C

## Vehicle Dynamic Scenario



| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Same Travel Direction |

ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 3-6-93 <br> 2240 <br> Avoid Collision $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Fog <br> Dry <br> Artificial lighting <br> Urban |
| Driver/Occupant Information |  | Vehicle Info | mation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 44 <br> Male <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1985 <br> Ford <br> Escort/EXP <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Physical barrier 5 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 06 Steering left <br> GV64: 01 Going straight <br> GV65: 10 This vehicle traveling over the lane line on left side of travel lane <br> GV66: 1 Tracking <br> GV67: 4 Vehicle departed roadway |  |  |  |

## CAUSAL FACTOR: Evasive Maneuver - Vehicle Encroaching into Lane Same Travel Direction

## ROADSIDE DEPARTURE: <br> Right

The subject vehicle was traveling along a left hand curve in the second northbound lane of a dry, ten-lane, divided, asphalt, expressway with a negative slope. The driver noted traffic slowing and overreacted by initially steering to the left and then overcorrecting back to the right. The vehicle exited the right edge of the roadway and struck a concrete barrier located beyond the shoulder with its right frontal area. The vehicle rotated clockwise, flipped onto its roof to the left, and continued rotating while upside-down. The vehicle came to rest on its top, straddling the first and second northbound lanes, facing in a northwesterly direction. The roadway was lighted and edge lines and lane lines were present. The driver was intoxicated ( $\mathrm{BAC}=0.28$ ).


Vehicle Dynamic Scenario



CAUSAL FACTOR:
ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 4-1-93 | Weather: | Clear/Cloudy |
| Time: | 0310 | Surface Condition: | Dry |
| Accident Type: | Parked Vehicle | Lighting: | Artificial lighting |
| Accident Severity: | 4 (K) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 47 | Year: | 1990 |
| Driver Sex: | Male | Vehicle Make: | Ford |
| Impairment: | Unknown | Vehicle Model: | Aerostar |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 3 | Defects: | No |

## Roadway Information

| Trafficway Type <br> (Median): | Physical barrier | Alignment: | Straight |
| :---: | :--- | :--- | :--- |
| No. of Lanes: | 6 | Slope: | Level |
|  |  | Speed Limit: | $80 \mathrm{~km} / \mathrm{h}$ |

## Cluster Variables

GV14: 01 No avoidance actions
GV64: 01 Going straight
GV65: $\quad 10$ This vehicle traveling over the lane line on left side of travel lane
GV66: 0 No avoidance maneuver
GV67: 0 No avoidance maneuver

## CAUSAL FACTOR: <br> Driver Inattention

ROADSIDE DEPARTURE: Left

The subject vehicle was traveling in the third north bound lane of a six-lane divided, level, dry, asphalt interstate roadway when it drifted across the median road edge line and struck a parked tow truck. The vehicle rotated counterclockwise, ejecting the driver, and continuing back across the travel lane where it was struck by another vehicle. The parked vehicle was located well within the left emergency lane/shoulder area with its emergency lights operating prior to the impact. The roadway was illuminated by overhead streetlights. The roadway lane markings and road edge lines were in new condition. There were no sight line restrictions noted. The causal factor was driver inattentive to driving task.

ACCIDENT COLLISION DIAGRAM


Vehicle Dynamic Scenario


```
CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Left
```

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 4-7-93 | Weather: | Unknown |
| Time: | 0425 | Surface Condition: | Unknown |
| Accident Type: | Control/Traction Loss | Lighting: | Artificial lighting |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 21 | Year: | 1988 |
| Driver Sex: | Male | Vehicle Make: | Buick |
| Impairment: | Other (alcoh. consumption <br> - BAC unknown) | Vehicle Model: | LeSabre |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: |  | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 06 Ste <br> GV64: 14 Cha <br> GV65: 06 Thi <br> GV66: 1 Tra <br> GV67: 4 Veh | ing left <br> ging lanes <br> vehicle loss of control due to ing <br> cle departed roadway | g too fast for conditions |  |



The subject vehicle was traveling on an eight-lane, divided, level, concrete interstate roadway, when it departed the left roadway edge line and struck the concrete median barrier. The vehicle was redirected back across the travel lanes and rolled over, ejecting the driver. The driver's speed was estimated at $161 \mathrm{~km} / \mathrm{h}(100 \mathrm{mph})$. Police reported that the driver had consumed alcohol prior to the accident. The lane lines and right roadway edge line were in new condition. The roadway was illuminated by overhead streets lights. The causal factor was vehicle speed with alcohol consumption as a contributing factor.
PSU No. 72 Cose Number - Strotum 078 K

Vehicle Dynamic Scenario


| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Same Travel Direction |

ROADSIDE DEPARTURE:
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 4-1-93 <br> 2359 <br> Avoid Collision <br> 1 (C) | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Wet <br> Artificial lighting <br> Urban |
| Driver/Occup | nt Information | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 32 <br> Male <br> None <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1989 <br> Honda <br> Accord <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Physical barrier <br> 8 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> 80 km/h |
| Cluster Variables |  |  |  |
| GV14: 08 Braking and steering left <br> GV64: 01 Going straight <br> GV65: 60 Other vehicle encroaching into lane from adjacent lane (same direction) over left lane line <br> GV66: 2 Skidding longitudinally - less than 30 degrees rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |


| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Same Travel Direction |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was traveling north during evening hours on a dry, eight-lane, divided, concrete interstate roadway with a $+2 \%$ slope. The vehicle departed the right roadway edge line, crossed the 3.2 m shoulder/emergency lane, and struck a concrete traffic barrier. The driver indicated he was encroached upon by a north bound vehicle traveling in the left adjacent lane that it suddenly entered his travel lane. The subject driver swerved to the right and lost control of the vehicle. The roadway was illuminated by overhead street lights. There were no sight line restrictions or adverse weather conditions. The causal factor was evasive maneuver (steered off roadway) to avoid an encroaching vehicle traveling in the same direction.
Csun No.


## CAUSAL FACTOR:

ROADSIDE DEPARTURE:

## Driver Inattention

Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 4-4-93 <br> 0055 <br> Control/Traction Loss $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Artificial lighting <br> Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 47 <br> Male <br> Intoxicated <br> (alcohol/drugs) <br> Unknown <br> 3 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1983 <br> Plymouth <br> Reliant (K) <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 09 This vehicle loss of control due to unknown <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

CAUSAL FACTOR:
ROADSIDE DEPARTURE: Right

Driver Inattention

The subject vehicle was traveling west on a dry, two-lane, undivided, asphalt roadway with a $+2 \%$ slope. The vehicle departed the right side of the roadway by mounting the 10 cm high barrier curb and striking a steel utility pole with the frontal plane. The pole was located 0.9 m laterally from the curb face. There were no adverse weather conditions and the roadway was illuminated by overhead street lights. The driver was cited by police for negligent driving and DWI for alcohol and drugs. The causal factor was driver inattention to the driving task and drifted off roadway with alcohol and drugs (DWI) listed as a contributing factor.


## Vehicle Dynamic Scenario



CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $\begin{aligned} & 1-1-93 \\ & 1909 \end{aligned}$ <br> Control/Traction Loss $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Snow/Sleet/Hail <br> Dry <br> None <br> Urban |
| Driver/Occup | nt Information | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 48 <br> Male <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1987 <br> Pontiac <br> Grand Prix (RWD) <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Level <br> $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 03 Braking (lockup) <br> GV64: 13 Negotiating a curve <br> GV65: 06 This vehicle loss of control due to traveling too fast for conditions <br> GV66: 2 Skidding longitudinally - less than 30 degrees rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |


| CAUSAL FACTOR: | Vehicle Speed - Speed and Alcohol |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |

The subject vehicle was traveling in a northeasterly direction on a two-lane roadway. As the vehicle entered a curve to the right, it crossed the full barrier center line, and the driver braked heavily. The vehicle skidded forward in a tracking attitude, exited the left edge of the roadway, and the left frontal area struck a tree located 4.3 m beyond the edge of the roadway. The vehicle then reportedly deflected to its right and rolled onto its left side. The subject driver was intoxicated ( $\mathrm{BAC}=0.25$ ) and was traveling at a witness estimated speed of $80-96 \mathrm{~km} / \mathrm{h}$ ( $50-60 \mathrm{mph}$ ).


Vehicle Dynamic Scenario


CAUSAL FACTOR: Driver Inattention
ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $1-5-93$ <br> 2215 <br> Control/Traction Loss $0(\mathrm{O})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> None <br> Rural |
| Driver/Occup | nt Information | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 46 <br> Male <br> None <br> No | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1993 <br> Pontiac <br> Bonneville/ Catalina <br> Yes <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 1 | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Steer <br> GV64: 13 Neg <br> GV65: 12 This <br> GV66: 3 Skid <br> GV67: 4 Vehi | ng right <br> iating a curve <br> ehicle traveling off the <br> ing laterally - clockwise <br> le departed roadway | oad on the left side |  |

## CAUSAL FACTOR: Driver Inattention <br> ROADSIDE DEPARTURE: Left

The subject vehicle was traveling on a one-lane entrance ramp which curved sharply to the right. The driver did not enter sufficient steering input to track the curve, and steered sharply to the right as the vehicle exited the left edge of the roadway. The vehicle yawed clockwise, rolled side-over-side to the left 1.5 rolls times, and came to rest on its roof. The driver was inattentive to the driving task.


Vehicle Dynamic Scenario


## CAUSAL FACTOR: Driver Inattention <br> ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 2-6-93 | Weather: | Clear/Cloudy |
| Time: | 2000 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 4 (K) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 16 | Year: | 1980 |
| Driver Sex: | Male | Vehicle Make: | Chevrolet |
| Impairment: | None | Vehicle Model: | Fullsize Blazer |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: |  | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $64 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 05 Pas <br> GV65: 12 Thi <br> GV66: 0 No <br> GV67: 0 No | oidance actions <br> g or overtaking an vehicle traveling of voidance maneuver voidance maneuver | oad on the left side |  |

CAUSAL FACTOR: Driver Inattention
ROADSIDE DEPARTURE: Left

The subject vehicle was traveling in the southbound lane of a two-lane, straight and level, rural roadway. The driver pulled to the left and entered the northbound travel lane to pass a non-contact vehicle. While passing this vehicle, the subject driver was apparently inattentive to the driving task and allowed the subject vehicle to drift off the left edge of the roadway. The driver overcorrected back to the right, re-entered, crossed, and exited the right edge of the roadway. The driver overcorrected back to the left, the vehicle yawed counterclockwise and rolled two complete times to the right, side-over-side, coming to rest on its wheels facing in an easterly direction. Both occupants of the vehicle were ejected during the rollover and the driver sustained fatal injuries.

ACCIDENT COLLISION DIAGRAM


Vehicle Dynamic Scenario


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 2-2-93 | Weather: | Clear/Cloudy |
| Time: | 1848 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 68 | Year: |  |
| Driver Sex: | Male | Vehicle Make: | Chevrolet |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Caprice/Impala |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 01 Goin <br> GV65: 13 This <br> GV66: $\quad 0 \quad$ No <br> GV67: $\quad 0 \quad$ No | oidance actions <br> straight <br> vehicle traveling off <br> oidance maneuver <br> oidance maneuver | road on the right side |  |

CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Driver Relinquishes Steering Control - Intoxicated
Right

The subject vehicle was traveling east on a dry, two-lane, undivided, level, asphalt roadway when it crossed the right roadway edge line and struck a utility pole located 0.4 m laterally from the barrier curb. The driver was tested for alcohol consumption and was reported with a BAC of 0.38 . The ambient conditions were clear during the dusk hours of the day. There were no roadway obstacles or sight line restrictions. The travel lanes were marked by solid, yellow, full barrier center lines and barrier curbs along both roadway edges. The causal factor was driver relinquished control due to intoxication.


Vehicle Dynamic Scenario


CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 2-1-93 <br> 0100 <br> Drive Off Road <br> 0 (0) | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Snow/Sleet/Hail <br> Ice/Snow <br> None <br> Rural |
| Driver/Occupant Information |  | Vehicle Info | mation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 25 <br> Male <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1991 <br> Ford <br> Ranger <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Physical barrier <br> 3 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 06 This vehicle loss of control due to traveling too fast for conditions <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Vehicle Speed - Speed and Alcohol
Right

The subject vehicle was traveling in the first eastbound lane of a straight and level, six-lane, divided interstate. The driver lost directional control. The vehicle exited the right edge of the roadway and then struck and mounted the guardrail adjacent to the south shoulder. The vehicle came to rest straddling the guardrail facing east southeast. The vehicle reportedly sustained damage to the undercarriage, but was repaired before inspected. The driver was intoxicated ( $\mathrm{BAC}=0.13$ ) and was traveling at a speed which was too fast for the snow/ice covered travel conditions.

## ACCIDENT COLLISION DIAGRAM




| CAUSAL FACTOR: | Evasive Maneüver - Avoid Animal or Pedestrian |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 3-7-93 | Weather: | Clear/Cloudy |
| Time: | 1820 | Surface Condition: | Dry |
| Accident Type: | Avoid Collision | Lighting: | Unknown |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 16 | Year: | 1991 |
| Driver Sex: | Male | Vehicle Make: | Hyundai |
| Impairment: | None | Vehicle Model: | Excel |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 4 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: | Straight <br> Grade |
| No. of Lanes: | 2 | Speed Limit: | $64 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Steering right |  |  |  |
| GV64: 01 Going straight |  |  |  |
| GV65: 87 Animal in roadway |  |  |  |
| GV66: 1 Tracking |  |  |  |
| GV67: 4 Vehicle departed roadway |  |  |  |

## CAUSAL FACTOR:

## ROADSIDE DEPARTURE:

Evasive Maneuver - Avoid Animal or Pedestrian
Right

The subject vehicle was proceeding in a northerly direction on a two-lane rural roadway. The subject driver steered to the right in an evasive maneuver to avoid an animal that was crossing the roadway from the driver's right. The subject vehicle exited the right edge of the roadway, proceeded through a drainage ditch, struck a tree with its left frontal area, rotated counterclockwise around the tree, and rolled one full roll while rotating.

## ACCIDENT COLLISION DIAGRAM




CAUSAL FACTOR: Lost Directional Control
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 3-7-93 <br> 0815 <br> Control/Traction Loss <br> 3 (A) | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Snow/Sleet/Hail <br> Ice/Snow <br> Daylight <br> Rural |
| Driver/Occup | nt Information | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 43 <br> Male <br> None <br> Yes <br> 2 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1991 <br> Oldsmobile <br> Cutlass (FWD) <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $64 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 10 Accelerating <br> GV64: 01 Going straight <br> GV65: 05 This vehicle loss of control due to poor road conditions <br> GV66: 3 Skidding laterally - clockwise rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |

## CAUSAL FACTOR: <br> Lost Directional Control

ROADSIDE DEPARTURE:

Right

The subject vehicle was traveling east on a snow covered, two-lane, undivided, roadway with a $-3 \%$ slope. The vehicle departed the right roadside in a clockwise rotation. The vehicle traveled approximately 12 m along the grass shoulder and struck a railroad crossing signal pole with the left side plane. The ambient weather condition was snow. The vehicle, prior to loss of control, had cleared a hill crest and was proceeding along a downgrade segment, approaching a railroad grade crossing. The causal factor was driver lost directional control on road surface. The negative slope of the roadway and the presence of the railroad crossing were also contributing factors.


Vehicle Dynamic Scenario


| CAUSAL FACTOR: | Vehicle Speed - Speed and Alcohol |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | $\begin{aligned} & 3-5-93 \\ & 1630 \end{aligned}$ <br> Control/Traction Loss $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> None <br> Rural |
| Driver/Occupant Information |  | Vehicle Info | mation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 23 <br> Male <br> Other (alcoh. consumption <br> - BAC .06) <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1992 <br> Chevrolet <br> Corvette <br> Yes <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $64 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 01 Goin <br> GV65: 13 This <br> GV66: $\quad 0 \quad$ No <br> GV67: $\quad 0$ No | oidance actions <br> straight <br> vehicle traveling off the edge <br> oidance maneuver <br> oidance maneuver | oad on the right side |  |

CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Right

The subject vehicle was traveling south on a dry, unlit, two-lane, undivided, asphalt roadway with a $-2 \%$ slope. The driver lost control of the vehicle and departed the right side of the roadway. The vehicle crossed a ditch, struck a fence post, rotated clockwise and struck a tree with the left side plane. The vehicle then continued by rotating in a counterclockwise direction and rolling over. Police indicated the vehicle had exceeded the speed limit. The driver had consumed an alcoholic beverage ( $\mathrm{BAC}=0.06$ ) and ingested illicit drugs prior to the crash. The causal factor was excessive vehicle speed with contributing factors of alcohol consumption and illicit drug use.


## Vehicle Dynamic Scenario



| CAUSAL FACTOR: | Driver Relinquishes Steering Control - Physical <br> (seizure/passed out) |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |



| CAUSAL FACTOR: | Driver Relinquishes Steering Control - Physical <br> (seizure/passed out) |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was traveling south on a dry, four-lane, undivided, level, asphalt roadway when the driver apparently had a seizure and departed the right roadside. The vehicle jumped the curb, struck a row of bushes, traveled over lawns, and impacted a house. The roadway departure occurred during daylight hours with no adverse environmental conditions. The roadway edges were defined by mountable curbs with opposing travel directions separated by solid barrier yellow center lines which were in poor condition. There were no lane lines present. The causal factor was driver relinquished control of the vehicle as the result of a seizure.



CAUSAL FACTOR: Lost Directional Control
ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-3-93 | Weather: | Snow/Sleet/Hail |
| Time: | 0030 | Surface Condition: | Ice/Snow |
| Accident Type: | Control/Traction Loss | Lighting: | None |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 66 | Year: | 1991 |
| Driver Sex: | Male | Vehicle Make: | Ford |
| Impairment: | None | Vehicle Model: | Tempo |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Medlan): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Level <br> $64 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 13 Neg <br> GV65: 05 Thi <br> GV66: 0 No <br> GV67: 0 No | voidance actions <br> tiating a curve <br> vehicle loss of control d <br> voidance maneuver <br> voidance maneuver | ad conditions |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE:

The subject vehicle was proceeding along a twisting, snow covered, two-lane, unlit roadway. The vehicle rotated clockwise when the driver lost directional control on a patch of ice, and exited the left side of the roadway. The vehicle's speed was $32 \mathrm{~km} / \mathrm{h}(20 \mathrm{mph})$ in a $64 \mathrm{~km} / \mathrm{h}$ ( 40 mph ) speed zone.

ACCIDENT COLLISION DIAGRAM
PSU No. 74 Cose Number - Strotum 002 C Indicate North ( 1

Vehicle Dynamic Scenario


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CAUSAL FACTOR: Lost Directional Control
ROADSIDE DEPARTURE: Left
```

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 1-6-93 <br> 2212 <br> Control/Traction Loss $4(\mathrm{~K})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Ice/Snow <br> Artificial lighting <br> Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 18 <br> Male <br> Intoxicated (alcohol/drugs) <br> Yes <br> 4 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1988 <br> Chevrolet <br> Cavalier <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 05 This vehicle loss of control due to poor road conditions <br> GV66: 0 No avoidance maneuver <br> GV67: $\quad 0 \quad$ No avoidance maneuver |  |  |  |

## CAUSAL FACTOR: Lost Directional Control <br> ROADSIDE DEPARTURE: Left

The subject vehicle was proceeding along a residential roadway during evening hours when it hit a patch of ice. The driver lost directional control of the vehicle which vecred to the left. The subject vehicle impacted two parked vehicles with the left side, proceeded another 15 m down the shoulder and impacted a tree. The driver was traveling below the speed limit.
PSU No. 74


CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Evasive Maneuver - Avoid Animal or Pedestrian
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-3-93 | Weather: | Clear/Cloudy |
| Time: | 1815 | Surface Condition: | Dry |
| Accident Type: | Avoid Collision | Lighting: | None |
| Accident Severity: | 2 (B) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 42 | Year: | 1985 |
| Driver Sex: | Male | Vehicle Make: | Toyota |
| Impairment: | None | Vehicle Model: | Pickup |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided $2$ | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Level <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Steer <br> GV64: 13 Nego <br> GV65: 05 This <br> GV66: 3 Skid <br> GV67: 4 Vehi | ng right <br> iating a curve vehicle loss of contr ing laterally - clock le departed roadwa | ad conditions |  |

CAUSAL FACTOR: Evasive Maneuver - Avoid Animal or Pedestrian
ROADSIDE DEPARTURE: ..... Right
The subject vehicle was proceeding along a dark, dirt and gravel roadway. The driver steered right to avoid a deer which had leaped into the roadway. The vehicle yawed and rotated clockwise, existing the roadway to the right.




CAUSAL FACTOR: ROADSIDE DEPARTURE:

Driver Relinquishes Steering Control - Intoxicated
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 1-1-93 <br> 0155 <br> Drive Off Road <br> 1 (C) | Weather: <br> Surface Condition: <br> LIghting: <br> Land Use: | Clear/Cloudy <br> Dry <br> None <br> Rural |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 46 <br> Male <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1977 <br> Oldsmobile <br> Cutlass <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Level <br> $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 13 Negotiating a curve <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: $\quad 0 \quad$ No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated

## ROADSIDE DEPARTURE:

The subject vehicle was proceeding along a two-lane trafficway. The driver relinquished steering control and drifted off the right side of the road. The driver was intoxicated.




## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Lost Directional Control Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-2-93 | Weather: | Clear/Cloudy |
| Time: | 1750 | Surface Condition: | Ice/Snow |
| Accident Type: | Control/Traction Loss | Lighting: | None |
| Accident Severity: | 1 (C) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 16 | Year: | 1988 |
| Driver Sex: | Female | Vehicle Make: | Buick |
| Impairment: | None | Vehicle Model: | Regal |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 13 Ne <br> GV65: 05 Th <br> GV66: 0 No <br> GV67: 0 No | voidance actions <br> tiating a curve <br> vehicle loss of control d <br> voidance maneuver <br> voidance maneuver | ad conditions |  |

```
CAUSAL FACTOR:
Lost Directional Control
ROADSIDE DEPARTURE: Left
```

The subject vehicle was proceeding along a rural, unlit, two-lane highway. The vehicle contacted a patch of black ice, started to rotate counterclockwise, departed the road on the left side and went down an embankment prior to impacting a culvert. The vehicle rolled over one-quarter turn, coming to rest on some rocks. The driver reported a travel speed of $48 \mathrm{~km} / \mathrm{h}$ ( 30 mph ) prior to hitting the ice.

## ACCIDENT COLLISION DIAGRAM


$\qquad$ Resolution

Roadway Roadway

| CAUSAL FACTOR: | Driver Relinquishes Steering Control - Fell Asleep |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 2-6-93 | Weather: | Clear/Cloudy |
| Time: | 0340 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Artificial lighting |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 57 | Year: | 1969 |
| Driver Sex: | Male | Vehicle Make: | Volkswagon |
| Impairment: | Fell Asleep | Vehicle Model: | Beetle 1300/1500 |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 2 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Allgnment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions |  |  |  |
| GV64: 01 Going straight |  |  |  |
| GV65: 12 This vehicle traveling off |  | oad on the left side |  |
| GV66: 0 No avoidance maneuver |  |  |  |
| GV67: 0 No avoidance maneuver |  |  |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Left

The subject vehicle was traveling along an expressway on-ramp when the driver fell asleep. The vehicle crossed over a raised median to the right of the road and impacted a second vehicle.



CAUSAL FACTOR:
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-1-93 | Weather: | Clear/Cloudy |
| Time: | 1620 |  |  |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 20 | Year: | 1980 |
| Driver Sex: | Male | Vehicle Make: | Subaru |
| Impairment: | None | Vehicle Model: | DL/FE/G/GF/ GLF/STD |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 3 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: | Curve Left <br> Level <br> $64 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No a <br> GV64: 13 Nego <br> GV65: 06 This <br> GV66: 0 No a <br> GV67: 0 No a | voidance actions tiating a curve vehicle loss of control d voidance maneuver voidance maneuver | $g$ too fast for conditions |  |

## CAUSAL FACTOR: Driver Inattention

ROADSIDE DEPARTURE:

## Right

The subject vehicle was traveling eastbound on a two-lane, mountain road. The vehicle was approaching a left curve when the driver looked out to the right to observe the scenery. By the time the driver looked back, the vehicle had exited the right edge of the roadway. The driver attempted to correct back onto the road. The vehicle rotated counterclockwise and impacted a dirt and snow mound. The impact launched the vehicle and started it rolling. The vehicle came to rest in an ice covered stream.

ACCIDENT COLLISION DIAGRAM
PSU No. 75

## Vehicle Dynamic Scenario


Return to

Roadway Resolution \begin{tabular}{c}
Roadway <br>
Departure <br>
Crash

$\quad$

Side Impact/ <br>
Rollover
\end{tabular}

## CAUSAL FACTOR:

ROADSIDE DEPARTURE:

Vehicle Speed - Speed and Alcohol
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 3-1-93 <br> 2145 <br> Control/Traction Loss $2 \text { (B) }$ | Weather: <br> Surface Condition: Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> None <br> Rural |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 19 <br> Male <br> Other (alcoh. consumption <br> - BAC unknown) <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1974 <br> Ford <br> Mustang/ <br> Mustang II <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 13 Negotiating a curve <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

## CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol

ROADSIDE DEPARTURE: Right

The subject vehicle was traveling in a northwesterly direction around a left curve on a dry, two-lane, rural, asphalt, roadway with a negative slope, full barrier center lines, and no edge lines. The vehicle failed to track a sharp curve to the left, exiting the right edge of the roadway. As the driver steered back to the left in an attempt to regain the roadway, the vehicle crossed a wide, graveled surface, entrance to a trailer park and began yawing counterclockwise. The vehicle then struck a large rock pile located immediately to the west of the trailer park entrance with its right rear quarter panel. This impact reversed the vehicle's rotation from counterclockwise to clockwise while the vehicle continued in a westerly direction in a broadside skid to the left, straddling the westbound travel lane and the north shoulder. The vehicle exited the roadway a second time and came to rest facing in a northerly direction straddling the north shoulder and an adjacent grassy embankment. The driver had been drinking and was traveling at a high rate of speed.


## Vehicle Dynamic Scenario



| CAUSAL FACTOR: | Vehicle Failure |
| :--- | :--- |
| ROADSIDE DEPARTURE: | End Departure |



## CAUSAL FACTOR: Vehicle Failure <br> ROADSIDE DEPARTURE: End Departure

The subject vehicle was traveling in a southerly direction on a dry, two-lane, residential, urban, asphalt, roadway with a negative slope, bounded by curbs, and with no surface markings. As the vehicle approached a T-intersection, the accelerator pedal reportedly fell to the floor resulting in sudden acceleration. The driver had intended to initiate a left turn at the intersection, but was not able to be successfully complete this maneuver. The vehicle exited the right edge of the intersecting roadway, impacted a house with its frontal plane, and came to rest in contact with the house, facing in an east southeasterly direction.
PSU No. 75


CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated
ROADSIDE DEPARTURE:
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 3-7-93 | Weather: | Clear/Cloudy |
| Time: | 2331 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: |  |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 26 | Year: | 1987 |
| Driver Sex: | Male | Vehicle Make: | Chevrolet |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | S-10 Blazer |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed LImit: | Straight <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 01 Go <br> GV65: 13 Thi <br> GV66: $\quad 0 \quad$ No <br> GV67: 0 No | oidance actions <br> straight <br> vehicle traveling off the <br> oidance maneuver <br> oidance maneuver | oad on the right side |  |

## CAUSAL FACTOR: <br> Driver Relinquishes Steering Control - Intoxicated

ROADSIDE DEPARTURE: Right

The subject vehicle was proceeding in a northerly direction on a dry, straight, two-lane, rural, asphalt, highway with a $+1 \%$ slope. The vehicle drifted off the right edge of the roadway and traveled along the right/east shoulder for a distance of 34 m . The driver steered sharply back to the left, the vehicle yawed counterclockwise as it reentered the roadway, and rolled twice side-over-side to the right. The vehicle came to rest on its wheels in a gully adjacent to the west shoulder facing southwest. The roadway was dark with white edge lines, broken yellow center line, and no artificial lighting. The driver was intoxicated ( $\mathrm{BAC}=0.31$ ).
PSU No. 75 Cose Number - Strotum


CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | $\begin{aligned} & 4-3-93 \\ & 0200 \\ & \text { Control/Traction Loss } \\ & 3 \text { (A) } \end{aligned}$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Wet <br> None <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 21 <br> Female <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1990 <br> Chevrolet <br> Nova/Geo Prizm <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $80 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 05 This vehicle loss of control due to poor road conditions <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE:

The subject vehicle was traveling in a northerly direction on a straight, wet, two-lane, rural, asphalt, highway with a negative slope, edge lines, and full barrier center lines. The sequence of pre-crash events is not clear; however, the vehicle yawed approximately 180 degrees in a counterclockwise direction and exited the left edge of the roadway. The vehicle crossed the shoulder and traversed a shallow drainage ditch proceeding rearward until the right rear quarter panel struck a utility pole located on the far bank of the ditch. The vehicle rotated counterclockwise off this impact and came to rest a short distance north of the pole, facing southeast. The driver was intoxicated and relinquished steering control. The roadway was dark and not lighted.
PSU No. 75 Cose Number - Strotum


CAUSAL FACTOR: ROADSIDE DEPARTURE:

Driver Inattention
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 1-4-93 <br> 2030 <br> Drive Off Road <br> 1 (C) | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> None <br> Rural |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 22 <br> Female <br> None <br> Unknown <br> 2 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1992 <br> Volkswagon <br> Jetta <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Level <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 13 Negotiating a curve <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

CAUSAL FACTOR:
Driver Inattention
ROADSIDE DEPARTURE:

Right

The subject vehicle was traveling in a westerly direction on a dry, level, two-lane, rural, asphalt, roadway. After exiting a curve to the right, the driver reportedly removed a pair of eyeglasses and did not realize that the vehicle was drifting to the right. The driver could not see without glasses. The vehicle exited the right edge of the roadway and traversed diagonally across a negative-sloped embankment. At the base of the embankment, the driver steered back to the left causing the vehicle to yaw counterclockwise and roll side-over-side to the right one complete turn. The vehicle came to rest on its wheels at the base of the embankment, facing in an easterly direction. The roadway was dark, unlighted, with edge lines, and a partial barrier center line.

## Vehicle Dynamic Scenario



CAUSAL FACTOR: ROADSIDE DEPARTURE: Evasive Maneuver - Avoid Animal or Pedestrian Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-4-93 | Weather: | Rain |
| Time: | 0855 | Surface Condition: | Wet |
| Accident Type: | Drive Off Road | Lighting: | Daylight |
| Accident Severity: | 0 (O) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 51 | Year: | 1988 |
| Driver Sex: | Male | Vehicle Make: | Jeep |
| Impairment: | None | Vehicle Model: | Comanche |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 08 Braki <br> GV64: 01 Going <br> GV65: 87 Anim <br> GV66: 4 Skidd <br> GV67: 4 Vehi | g and steering left straight in roadway <br> ing laterally - count <br> le departed roadway |  |  |


| CAUSAL FACTOR: | Evasive Maneuver - Avoid Animal or Pedestrian |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |

The subject vehicle was traveling northbound on a two-lane roadway when a deer entered the road. The driver steered to avoid the animal and the vehicle left the road and rolled.


Vehicle Dynamic Scenario


| CAUSAL FACTOR: | Vehicle Speed - Speed and Alcohol |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 2-1-93 | Weather: | Rain |
| Time: | 0213 | Surface Condition: | Wet |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 2 (B) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 23 | Year: | 1976 |
| Driver Sex: | Male | Vehicle Make: | Chevrolet |
| Impairment: | Intoxicated <br> (alcohol/drugs) | Vehicle Model: | Camaro |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: |  | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: | Straight <br> Level <br> 64 km/h |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 01 Goi <br> GV65: 06 Thi <br> GV66: 0 No <br> GV67: 0 No | oidance actions <br> straight <br> vehicle loss of contro <br> voidance maneuver <br> voidance maneuver | g too fast for conditions |  |

# CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol <br> ROADSIDE DEPARTURE: Left 

The subject vehicle was traveling on a wet, unlit, two-lane, asphalt roadway. The driver lost control and exited the roadway to the left side of the road. The vehicle impacted some bushes and came to rest on the shoulder of the road. The driver had been drinking previously and was traveling in excess of the speed limit. The roadway had no edge markings.
PSU No. 76 Cose Number - Strotum O12F

Vehicle Dynamic Scenario


CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-4-93 | Weather: | Snow/Sleet/Hail |
| Time: | 0055 | Surface Condition: | Ice/Snow |
| Accident Type: | Control/Traction Loss | Lighting: | None |
| Accident Severity: | 2 (B) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 20 | Year: | 1989 |
| Driver Sex: | Male | Vehicle Make: | Chevrolet |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | C, K, R, V-series |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 5 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: | Straight <br> Level |
| No. of Lanes: | 2 | Speed Limit: | $89 \mathrm{~km} / \mathrm{h}$ |

## Cluster Variables

GV14: 01 No avoidance actions
GV64: 13 Negotiating a curve
GV65: 05 This vehicle loss of control due to poor road conditions
GV66: $\quad 0$ No avoidance maneuver
GV67: 0 No avoidance maneuver

CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Right

The subject vehicle was traveling along a two-lane, mountainous roadway. The driver claimed to hit a patch of ice. The vehicle slid off the roadway, went down into a ditch, and impacted a ridge. The driver had been drinking and was speeding.


Vehicle Dynamic Scenario


CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Lost Directional Control
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 2-2-93 | Weather: | Rain |
| Time: | 2215 | Surface Condition: | Wet |
| Accident Type: | Control/Traction Loss | Lighting: | None |
| Accident Severity | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 25 | Year: | 1988 |
| Driver Sex: | Male | Vehicle Make: | Pontiac |
| Impairment: | None | Vehicle Model: | Unknown |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $80 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 03 Bra <br> GV64: 02 Slo <br> GV65: 05 Thi <br> GV66: 2 Ski <br> GV67: 4 Ve | ing (lockup) <br> ng or stopping in traffic vehicle loss of control du ing longitudinally - less le departed roadway | ad conditions rees rotation |  |

```
CAUSAL FACTOR:
    Lost Directional Control
ROADSIDE DEPARTURE: Right
```

The subject vehicle was proceeding along a wet, dark and unlit, mountainous roadway. The driver lost control due to the wet surface, applied the vehicle's brakes, and was unable to regain control. The vehicle exited the roadway on the right side, traveled into a gully, impacted rocks, and flipped onto the roof. The driver was traveling to work along a familiar route and was proceeding faster than was prudent.
PSU No. 76


CAUSAL FACTOR: Driver Inattention
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | $\begin{aligned} & 3-7-93 \\ & 0655 \end{aligned}$ <br> Control/Traction Loss $2 \text { (B) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Daylight <br> Rural |
| Driver/Occup | nt Information | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 30 <br> Female <br> Other (driver fatigued) <br> Unknown <br> 2 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1991 <br> Subaru <br> Legacy <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Driver Inattention
Right

The subject vehicle was traveling along a left curve on a dry, two-lane, undivided, asphalt, rural roadway with a slope of $-3 \%$., The vehicle departed the right road edge, re-entered the travel lanes, crossing over to the left side of the road, and impacting the ditch embankment beyond the road edge. The curved road segment preceding the initial road departure was superelevated approximately $3 \%$. The driver was reported by the police to have been fatigued and driving to fast for conditions. It appeared that the vehicle drifted over the right road edge line and that the driver then over corrected to the left causing a counterclockwise rotation. There were no adverse weather conditions and the road edge lines and full barrier yellow center lines were in new condition. The causal factor was driver was inattentive to driving task and drifted off roadway with mental fatigue and excessive vehicle speed for curve as contributing factors.


## Vehicle Dynamic Scenario



CAUSAL FACTOR: ROADSIDE DEPARTURE:

Driver Relinquishes Steering Control - Intoxicated
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 3-7-93 | Weather: | Clear/Cloudy |
| Time: | 2250 | Surface Condition: | Dry |
| Accident Type: | Parked Vehicle | Lighting: | None |
| Accident Severity: | 0 (O) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 30 | Year: | 1965 |
| Driver Sex: | Male | Vehicle Make: | Ford |
| Impairment: | Other (alcoh. consumption - BAC unknown) | Vehicle Model: | Thunderbird |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions |  |  |  |
| GV64: 09 Turning right |  |  |  |
| GV65: 13 This vehicle traveling off the edge |  | oad on the right side |  |
| GV66: 0 No avoidance maneuver |  |  |  |
| GV67: 0 No avoidance maneuver |  |  |  |

# CAUSAL FACTOR: ROADSIDE DEPARTURE: <br> Driver Relinquishes Steering Control - Intoxicated <br> Right 

The subject vehicle was traveling east on a dark, two-lane, undivided, straight, urban, level, dry, asphalt roadway with no overhead illumination. The vehicle drifted off the right side of the road and struck the rear of a parked pickup truck. The police cited the driver with DWI. The driver stated he had been working hard all day and fell asleep prior to drifting off the road. The roadway markings consisted of only a broken yellow center line which was in poor condition. There were no sight line restrictions or road obstacles impeding the driver. The causal factor was intoxication. A contributory factor may have been fatigue.

ACCIDENT COLLISION DIAGRAM


Vehicle Dynamic Scenario
Return to $\qquad$ Resolution Roadway
Controlled /

Roadway
Departure
Crash Frontal Impact
672

CAUSAL FACTOR:
ROADSIDE DEPARTURE:

## Driver Inattention

Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 9-7-93 | Weather: | Clear/Cloudy |
| Time: | 2058 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Artificial lighting |
| Accident Severity: | 1 (C) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 46 | Year: | 1985 |
| Driver Sex: | Female | Vehicle Make: | Chevrolet |
| Impairment: | Other (driver fatigued) | Vehicle Model: | G-series van |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 1 | Defects: |  |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 01 Goi <br> GV65: 13 Thi <br> GV66: 0 No <br> GV67: 0 No | oidance actions <br> straight <br> vehicle traveling off the <br> voidance maneuver <br> voidance maneuver | oad on the right side |  |

CAUSAL FACTOR: Driver Inattention
ROADSIDE DEPARTURE: Right

The subject vehicle was traveling south on a wide, dry, two-lane, undivided, level, urban, asphalt roadway which was illuminated by overhead street lights. The vehicle drifted off the right road edge and struck a horizontal gas line which was located parallel to the road and spanned a narrow canal. The driver was tired and looked down causing the vehicle to depart the road. There were no adverse weather conditions or sight line restrictions to impede the driver's vision. The center of the road was defined by full barrier yellow center lines which were in new condition. The road edges looked like painted lines. There were no delineators or reflective road markers. The causal factor was driver inattentive to the driving task.


## Vehicle Dynamic Scenario



Roadway


Return to Resolution

Departure
Roadway

CAUSAL FACTOR: ROADSIDE DEPARTURE:

Vehicle Speed - Speed and Alcohol
Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 4-6-93 | Weather: | Clear/Cloudy |
| Time: | 2230 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 26 | Year: | 1983 |
| Driver Sex: | Male | Vehicle Make: | Toyota |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Pickup |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 2 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $80 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 01 Goi <br> GV65: 12 Thi <br> GV66: 0 No <br> GV67: 0 No | oidance actions <br> straight <br> vehicle traveling off <br> oidance maneuver <br> oidance maneuver | road on the left side |  |


| CAUSAL FACTOR: | Vehicle Speed - Speed and Alcohol |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |

The subject vehicle was traveling in an easterly direction on a rural, two-lane, level, gravel roadway during evening hours in an $80 \mathrm{~km} / \mathrm{h}$ speed zone. The roadway was dry, straight, unlighted, and the ambient weather condition was clear. The subject driver was intoxicated and traveling at a high rate of speed. He allowed the subject vehicle to drift to the left and exit the north edge of the roadway. The subject vehicle subsequently yawed in a counterclockwise direction and rolled side-over-side to the right. The vehicle rolled one-half roll and came to rest on it's roof. The causal factor was driver intoxication and vehicle speed.

ACCIDENT COLLISION DIAGRAM



## CAUSAL FACTOR: Vehicle Failure <br> ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 4-2-93 <br> 1520 <br> Control/Traction Loss $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Daylight <br> Rural |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 28 <br> Male <br> None <br> Unknown <br> 2 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1981 <br> Chevrolet <br> $\mathrm{C}, \mathrm{K}, \mathrm{R}, \mathrm{V}$-series <br> No <br> Tire Blowout |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $80 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 01 This vehicle loss of control due to blow out or flat tire <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

```
CAUSAL FACTOR: Vehicle Failure
ROADSIDE DEPARTURE: Left
```

The subject vehicle was traveling along a rural, level, two-lane, asphalt roadway when the left front tire blew out. The driver lost control of the vehicle which started to spin counterclockwise. The vehicle departed the road to the left when its tires dug in and the vehicle overturned. The vehicle came to rest facing north, on the its top.

ACCIDENT COLLISION DIAGRAM



CAUSAL FACTOR:
ROADSIDE DEPARTURE:
Vehicle Failure
Right


| CAUSAL FACTOR: | Vehicle Failure |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was traveling westbound on a dry, level, two-lane, rural, asphalt roadway. The driver reported that the vehicle's transmission seized. The driver applied the brakes and caused lock-up. The vehicle departed the roadway on the right side and overturned.


## Vehicle Dynamic Scenario



CAUSAL FACTOR: Driver Relinquishes Steering Control - Fell Asleep
ROADSIDE DEPARTURE: Right


| CAUSAL FACTOR: | Driver Relinquishes Steering Control - Fell Asleep |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Right |

The subject vehicle was traveling eastbound on a level, two-lane, rural, asphalt roadway. The subject driver fell asleep at the wheel and exited the roadway on the right. The vehicle struck a guardrail and continued forward. The vehicle vaulted off a drop into a dry wash.

## ACCIDENT COLLISION DIAGRAM




## CAUSAL FACTOR: <br> Driver Inattention <br> ROADSIDE DEPARTURE: <br> Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | $\begin{aligned} & 3-4-93 \\ & 0315 \end{aligned}$ <br> Control/Traction Loss $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Unknown <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 19 <br> Male <br> None <br> Yes <br> 2 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1993 <br> Mazda <br> Pickup <br> Unknown <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Physical barrier <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $105 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 12 This vehicle traveling off the edge of the road on the left side <br> GV66: $\quad 0 \quad$ No avoidance maneuver <br> GV67: $\quad 0 \quad$ No avoidance maneuver |  |  |  |

CAUSAL FACTOR: ..... Driver Inattention
ROADSIDE DEPARTURE: ..... Left

The subject vehicle was traveling westbound on a dry, level, two-lane, divided, rural, asphalt, interstate roadway. The driver was talking to the passenger when the vehicle drifted off the left side of the roadway. The driver overcorrected to the right causing the vehicle to spin. The vehicle re-entered the road, overturned and struck a right of way fence.

| PSU No. 78 | Cose Number - Strotum 052 J | Indicate North $\Theta$ |
| :---: | :---: | :---: |
|  |  |  |



| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 4-3-93 <br> 1330 <br> Drive Off Road $3(\mathrm{~A})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Daylight <br> Rural |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 25 <br> Female <br> None <br> Unknown <br> 2 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1981 <br> Chevrolet <br> Citation <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided $2$ | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Level <br> $72 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 13 Negotiating a curve <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

CAUSAL FACTOR:
ROADSIDE DEPARTURE:

## Driver Inattention

Right

The subject vehicle was traveling north on a dry, level, two-lane, undivided, rural, asphalt roadway when the driver became distracted by a child passenger. As the driver looked at the child, the vehicle departed the road, traveled across the shoulder and dropped off the pavement onto the gravel area adjacent to the shoulder. The driver reacted by steering to the left. The vehicle rotated in a counterclockwise direction and struck the blunt end of a break away W-beam guardrail with the vehicle's right side plane. There were no adverse weather conditions or sight line restrictions. The road edges were marked by solid white lines in new condition and full barrier yellow lines also in new condition. The causal factor was driver inattention to driving task due to looking at a child passenger which allowed the vehicle to drift off the road.
PSU No. 78 Cose Number - Strotum Indicote North (

## Vehicle Dynamic Scenario



CAUSAL FACTOR:
ROADSIDE DEPARTURE: End Departure


CAUSAL FACTOR:<br>ROADSIDE DEPARTURE: End Departure

The subject vehicle was proceeding in an easterly direction during daylight hours on a level, two-lane, urban, asphalt, residential street with edge lines and a solid yellow center line. The driver apparently was not aware that the roadway ended at an L-intersection with a north/south roadway. As the vehicle approached the intersection, the driver applied heavy brake pedal pressure. The vehicle skidded straight forward 12 m , exited the east edge of the intersection, struck and penetrated a wooden barricade, and then vaulted 24 m into a deep drainage ditch. The vehicle apparently rolled during the vault and came down on its top in the drainage ditch. The vehicle slid a short distance and came to rest, upside down, facing in a southerly direction. The driver had been drinking and was traveling at a high rate of speed. The investigating officer estimated the vehicle's speed at $114 \mathrm{~km} / \mathrm{h}(71 \mathrm{mph})$ in a $40 \mathrm{~km} / \mathrm{h}(25 \mathrm{mph})$ speed zone.


Vehicle Dynamic Scenario


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 5-6-93 | Weather: | Clear/Cloudy |
| Time: | 0930 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 28 | Year: | 1980 |
| Driver Sex: Impairment: | Male | Vehicle Make: | Ford |
|  | None | Vehicle Model: | F-series pickup |
| Familiarity with Road: <br> No. of Occupants: | Unknown | ABS: | No |
|  | 2 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $80 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Ste <br> GV64: 05 Pas <br> GV65: 04 Thi <br> GV66: 3 Ski <br> GV67: 4 Veh | ing right <br> g or overtaking another vehicle loss of control d ing laterally - clockwise le departed roadway | abling vehicle problem |  |

CAUSAL FACTOR: Vehicle Speed - Unsafe Driving Act
ROADSIDE DEPARTURE: Right

The subject vehicle was traveling south on a dry, level, two-lane, rural, asphalt roadway. The driver attempted to a pass a non-contact vehicle when another non-contact vehicle was seen coming from the other direction. The driver accelerated, pulled right and lost control of the vehicle which departed the right side of the roadway and rotated clockwise. The vehicle hit a culvert and flipped.

## ACCIDENT COLLISION DIAGRAM



## Vehicle Dynamic Scenario



| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | $\begin{aligned} & 5-7-93 \\ & 2055 \end{aligned}$ <br> Control/Traction Loss $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> None <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 28 <br> Male <br> Fell Asleep <br> No <br> 4 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1969 <br> Mercury <br> Montego <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided $2$ | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $105 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Steering right <br> GV64: 01 Going straight <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 3 Skidding laterally - clockwise rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |

The subject vehicle was traveling westbound on a dry, two-lane, divided, rural, asphalt interstate with a negative slope. The subject driver fell asleep, steered right, and exited the roadway on the right. The vehicle struck an embankment, became airborne and landed on the left rear portion of the vehicle.



CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Driver Inattention
Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | $\begin{aligned} & 7-2-93 \\ & 1235 \end{aligned}$ <br> Control/Traction Loss $0(\mathrm{O})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Daylight <br> Rural |
| Driver/Occup | nt Information | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 34 <br> Male <br> None <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1991 <br> Nissan/Datsun <br> 200SX / 240SX <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Physical barrier $2$ | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade 105 km/h |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 13 Negotiating a curve <br> GV65: 12 This vehicle traveling off the edge of the road on the left side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

CAUSAL FACTOR: Driver Inattention
ROADSIDE DEPARTURE: Left

The subject vehicle was traveling along a dry, divided, two-lane, rural, asphalt interstate roadway. The driver lost control of the vehicle while looking for something. The driver overcorrected, spun the vehicle, and hit a guardrail.


CAUSAL FACTOR: ROADSIDE DEPARTURE:

Driver Relinquishes Steering Control - Intoxicated
Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 1-5-93 <br> 2355 <br> Drive Off Road <br> 3 (A) | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Wet <br> Artificial lighting <br> Urban |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 63 <br> Male <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1975 <br> Cadillac <br> DeVille/ <br> Fleetwood <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Flush or curb <br> 1 | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $80 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 15 Merging <br> GV65: 12 This vehicle traveling off the edge of the road on the left side <br> GV66: $\quad 0 \quad$ No avoidance maneuver <br> GV67: $\quad 0 \quad$ No avoidance maneuver |  |  |  |

# CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated ROADSIDE DEPARTURE: Left 

The subject vehicle was traveling in a southeasterly direction on a wet, lighted, one-lane, superelevated, concrete, entrance ramp with edge lines. The driver attempted to merge onto a freeway and allowed the vehicle to drift to the left, override a raise zone area, cross three southbound travel lanes of the freeway, and then to strike a concrete median barrier with the left frontal plane. The vehicle slid a short distance along the barrier and came to rest facing south southeast, adjacent to the barrier, in the breakdown lane. The driver was intoxicated ( $\mathrm{BAC}=0.14$ ).


## Vehicle Dynamic Scenario



CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Lost Directional Control
Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-4-93 | Weather: | Rain |
| Time: | 0450 | Surface Condition: | Wet |
| Accident Type: | Control/Traction Loss | Lighting: | None |
| Accident Severity | 0 (O) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 48 | Year: | 1987 |
| Driver Sex: | Male | Vehicle Make: | Dodge |
| Impairment: | None | Vehicle Model: | Unknown (light truck) |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 2 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 99 Un <br> GV64: 01 Go <br> GV65: 06 Th <br> GV66: 9 Pre <br> GV67: 9 Di | own <br> straight <br> vehicle loss of control du ash stability unknown tional consequences unk | $g$ too fast for conditions |  |

CAUSAL FACTOR: Lost Directional Control
ROADSIDE DEPARTURE:
Left

The subject vehicle was traveling through rain in the third northbound travel lane of a wet, level, eight-lanc, divided, concrete, interstate route with edge lines and lane lines. The vehicle hydroplaned in an accumulation of water causing the driver to lose directional control. The vehicle skidded to the left, struck a concrete median barrier with its left frontal area, and then deflected back into the roadway. The vehicle came to rest straddling two lanes facing in a northeasterly direction.

## ACCIDENT COLLISION DIAGRAM



Vehicle Dynamic Scenario

CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol

ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 2-1-93 | Weather: | Clear/Cloudy |
| Time: | 0200 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Artificial lighting |
| Accident Severity: | 4 (K) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 30 | Year: | 1983 |
| Driver Sex: | Male | Vehicle Make: | Nissan/Datsun |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Z-car, ZX |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Level <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Stee <br> GV64: 13 Neg <br> GV65: 06 This <br> GV66: 1 Trac <br> GV67: 4 Veh | ng right <br> iating a curve <br> vehicle loss of contro <br> ing <br> le departed roadway | too fast for conditions |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Vehicle Speed - Speed and Alcohol <br> Left

The subject vehicle was traveling in a northerly direction around an S-curve on a two-lane, urban, residential street. The driver successfully negotiated the first half of the curve to the left but then struck and mounted the west curb causing the vehicle to vault and rotate clockwise. After exiting the roadway, the airborne vehicle struck a street sign and a 1 m diameter tree, located 1 meter west of the curb line, with its left door and C-pillar area. The vehicle had rotated nearly 90 degrees clockwise to its path of travel at the point of impact with the tree. Following this impact, the vehicle reversed rotation and rotated nearly 180 degrees counterclockwise while rolling onto its top. The vehicle came to rest a short distance north of the tree, straddling the west curb line, facing west southwest. The driver was intoxicated ( $B A C=0.24$ ) and was traveling at a high rate of speed in a $40 \mathrm{~km} / \mathrm{h}(25 \mathrm{mph})$ speed zone.

ACCIDENT COLLISION DIAGRAM



CAUSAL FACTOR: Driver Relinquishes Steering Control - Fell Asleep ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 2-7-93 <br> 0120 <br> Drive Off Road $0(0)$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Wet <br> Artificial lighting <br> Urban |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 30 <br> Male <br> Fell Asleep <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1964 <br> Chevrolet <br> C, K, R, V-series <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Flush or curb 7 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

## CAUSAL FACTOR:

ROADSIDE DEPARTURE:

## Driver Relinquishes Steering Control - Fell Asleep

Right

The subject vehicle was traveling along a seven-lane, undivided, two way, urban roadway. The driver fell asleep at the wheel. The vehicle ran off the right side of the road and impacted a breakaway pole. The vehicle came to rest at the impact location.

## ACCIDENT COLLISION DIAGRAM



## Vehicle Dynamic Scenario



Controlled /
Uncontrolled - Drift Movement

Controlled /
Uncontrolled - Drift Movement

Return to Roadway

Resolution


Roadway
$\begin{gathered}\text { Departure } \\ \text { Crash }\end{gathered}$ Frontal Impact

CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Vehicle Speed - Excessive
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 1-3-93 <br> 2100 <br> Control/Traction Loss $3(\mathrm{~A})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Unknown <br> Wet <br> Artificial lighting <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 22 <br> Female <br> None <br> Yes <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1989 <br> Chevrolet <br> Spectrum <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Steering right <br> GV64: 13 Negotiating a curve <br> GV65: 13 This vehicle traveling off the edge of the road on the right side <br> GV66: 1 Tracking <br> GV67: 4 Vehicle departed roadway |  |  |  |

## CAUSAL FACTOR: ROADSIDE DEPARTURE: <br> Vehicle Speed - Excessive <br> Right

The subject vehicle was traveling on a wet, lit, two-lane, rural roadway during the evening hours. The vehicle started to fishtail and the driver tried to correct. The vehicle exited the road to right and impacted a tree. The driver was proceeding along the road at $98 \mathrm{~km} / \mathrm{h}$ ( 60 mph ) in a $56 \mathrm{~km} / \mathrm{h}(35 \mathrm{mph})$ speed zone. The driver was familiar with roadway.

| Calspan Corporation |  |
| :--- | :--- |
| Carnegie Mellon University |  |

PSU No. 81 Cose Number - Strotum 010 J indicate North (1)


Return to

Roadway $\quad$| Roadway |
| :---: |
| Desoluture |
| Crash | Frontal Impact

| CAUSAL FACTOR: | Evasive Maneuver - Vehicle Encroaching into Lane - |
| :--- | :--- |
|  | Same Travel Direction |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-3-93 | Weather: | Rain |
| Time: | 0635 | Surface Condition: | Wet |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 0 (O) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 32 | Year: | 1989 |
| Driver Sex: | Female | Vehicle Make: | Honda |
| Impairment: | None | Vehicle Model: | Civic/CRX |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Flush or curb | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 06 Steer <br> GV64: 16 Succ <br> GV65: 60 Othe <br> GV66: 1 Trac <br> GV67: 4 Vehi | ng left <br> ssful avoidance of vehicle encroachin ing <br> le departed roadwa | adjacent lane (same dire | n) over left lane line |

## CAUSAL FACTOR: Evasive Maneuver - Vehicle Encroaching into Lane Same Travel Direction <br> ROADSIDE DEPARTURE: Left

The subject vehicle was traveling in an easterly direction in the second lane of a four-lane, divided interstate. A non-contact vehicle traveling slightly forward of the subject in the first eastbound lane moved left and attempted to enter the second eastbound lane. The subject driver steered left to avoid the non-contact vehicle and exited the left edge of the roadway. The subject driver steered sharply back to the right. The vehicle yawed in a clockwise direction and continued skidding through the median, contacting the median surface with its undercarriage. The vehicle came to rest in the median, facing a southerly direction.



## CAUSAL FACTOR: Lost Directional Control

ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | $\begin{aligned} & 1-7-93 \\ & 2140 \end{aligned}$ <br> Control/Traction Loss $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Rain <br> Ice/Snow <br> None <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 30 <br> Male <br> None <br> Unknown <br> 2 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1979 <br> Ford <br> F-series pickup <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Flush or curb $2$ | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade $105 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Steering right <br> GV64: 13 Negotiating a curve <br> GV65: 05 This vehicle loss of control due to poor road conditions <br> GV66: 4 Skidding laterally - counterclockwise rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |

# CAUSAL FACTOR: Lost Directional Control <br> ROADSIDE DEPARTURE: Left 

The subject vehicle was traveling eastbound in the second lane of a six-lane, divided interstate with a $-3 \%$ slope and a curve to the left. As the vehicle exited the curve, the driver encountered an ice patch. The vehicle yawed in a clockwise direction and skidded off the roadway in a broadside skid. The right door of the vehicle struck a single pole mounted road sign. The vehicle then rolled side-over-side to right 1.5 times and came to rest on its top facing in a north northwesterly direction.

## ACCIDENT COLLISION DIAGRAM



## Vehicle Dynamic Scenario



| CAUSAL FACTOR: | Vehicle Speed - Speed and Alcohol |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 2-2-93 | Weather: | Clear/Cloudy |
| Time: | 2210 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | None |
| Accident Severity: | 2 (B) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 26 | Year: | 1979 |
| Driver Sex: | Male | Vehicle Make: | Mercury |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Cougar/XR7 |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 03 Bra <br> GV64: 13 Neg <br> GV65: 06 Thi <br> GV66: 2 Ski <br> GV67: 4 Veh | ing (lockup) <br> tiating a curve <br> vehicle loss of contro <br> ing longitudinally - <br> le departed roadway | too fast for conditions ees rotation |  |

## CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: Left

The subject vehicle was traveling a southerly direction on a two-lane, rural roadway. The driver failed to track a curve to the right and braked heavily leaving 30 m skid marks, as reported by the police. The vehicle skidded off the roadway and struck a utility pole with its center front. The vehicle came to rest at the pole, facing in a southerly direction. The subject driver was intoxicated ( $\mathrm{BAC}=0.24$ ) and traveling too fast for the roadway.


Vehicle Dynamic Scenario



| CAUSAL FACTOR: | Driver Relinquishes Steering Control - Fell Asleep |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 4-6-93 | Weather: | Clear/Cloudy |
| Time: | 1535 | Surface Condition: |  |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 18 | Year: | 1984 |
| Driver Sex: | Female | Vehicle Make: | Chevrolet |
| Impairment: | Fell Asleep | Vehicle Model: | Cavalier |
| Familiarity with Road: <br> No. of Occupants: | Yes | ABS: | No |
|  | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Flush or curb | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $105 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 13 Neg <br> GV65: 13 Thi <br> GV66: 0 No <br> GV67: 0 No | oidance actions tiating a curve vehicle traveling off the voidance maneuver voidance maneuver | road on the right side |  |

CAUSAL FACTOR:
ROADSIDE DEPARTURE: Left

The subject vehicle was proceeding in a northwesterly direction traversing a left curve in the third lane of a six-lane, divided, asphalt interstate with a negative slope, edge lines, and lane lines. The driver apparently fell asleep while negotiating the curve to the left. The vehicle drifted left and exited the left edge of roadway traveling along the shoulder. The driver woke at this point and steered sharply back to the right. The subject vehicle re-entered the roadway, rotating clockwise. It crossed the travel lanes in a broadside skid with its left side leading and exited the right, edge of the roadway. The vehicle struck a W-beam guardrail located adjacent to the north shoulder with its left side. It penetrated through the guardrail and then rolled $1 / 2$ roll onto its top, side-over-side to left. The vehicle came to rest on a negative-sloped embankment, beyond the guardrail, on its top, facing northeast.

ACCIDENT COLLISION DIAGRAM
PSU No. 81 COse Number - Strotum O56K

Vehicle Dynamic Scenario


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 4-3-93 | Weather: | Rain |
| Time: | 0851 | Surface Condition: | Wet |
| Accident Type: | Drive Off Road | Lighting: | Daylight |
| Accident Severity: | 1 (C) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 33 | Year: | 1980 |
| Driver Sex: | Female | Vehicle Make: | Ford |
| Impairment: | None | Vehicle Model: | Fairmont |
| Familiarity with Road: | Yes | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Flush or curb | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 99 Unk <br> GV64: 10 Tur <br> GV65: 14 Thi <br> GV66: 9 Pre <br> GV67: 9 Dir | own <br> ing left <br> vehicle traveling off <br> ash stability unknow <br> tional consequence |  |  |

# CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> End Departure <br> <br> \section*{Lost Directional Control} 

 <br> <br> \section*{Lost Directional Control}}

The subject vehicle was proceeding in an easterly direction on a wet, three-lane, rural roadway which ended in a T-intersection with a four-lane, divided roadway. As the driver approached the intersection, the traffic signal was green for eastbound traffic so the driver initiated a left turn onto the intersecting four-lane roadway. The vehicle was unable to complete the turn, exited the east edge of the intersection roadway, and struck a light standard which fell on top of the vehicle following the initial impact. The vehicle came to rest straddling the east edge of the intersecting roadway, facing in a northeasterly direction. The driver initiated the turn at a speed which was too high to successfully complete the maneuver given the wet road conditions.

## ACCIDENT COLLISION DIAGRAM




| CAUSAL FACTOR: | Vehicle Speed - Speed and Alcohol |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |


| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 4-7-93 <br> 2300 <br> Control/Traction Loss $3(\mathrm{~A})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Wet <br> Artificial lighting <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 24 <br> Male <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 4 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1971 <br> Oldsmobile <br> Cutlass <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 4 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 07 Steering right <br> GV64: 05 Passing or overtaking another vehicle <br> GV65: 06 This vehicle loss of control due to traveling too fast for conditions <br> GV66: 3 Skidding laterally - clockwise rotation <br> GV67: 4 Vehicle departed roadway |  |  |  |

# CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: Left 

The subject vehicle was traveling in a southeasterly direction negotiating a left curve in the second lane on a wet, four-lane, rural, asphalt roadway with a $+3 \%$ slope, white edge lines, and lane center lines delineated by flush markers. While traversing the curve, the subject driver passed a non-contact vehicle traveling in the first lane and lost directional control. After several overcorrections, the vehicle began yawing clockwise, exited the right, west edge of the roadway, traversed a paved shoulder, and the front of the vehicle struck the blunt end of a W-beam guardrail. The end treatment was uprooted and the left door of the vehicle struck one of the guardrail support posts as the vehicle continued to rotate and override the W -section rail. The vehicle came to rest straddling the rail, facing south. The driver was intoxicated ( $\mathrm{BAC}=0.12$ ) and was traveling at a speed that was too fast for conditions.


Vehicle Dynamic Scenario


Controlled /
Uncontrolled - Tracking Movement

Controlled $/$
Uncontrolled - Yaw Movement

Return to
Roadway
Resolution
Roadway
Departure - Frontal Impact
Crash

## CAUSAL FACTOR: Driver Relinquishes Steering Control - Fell Asleep ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 5-2-93 | Weather: | Rain |
| Time: | 0415 | Surface Condition: | Wet |
| Accident Type: | Drive Off Road | Lighting: | Artificial lighting |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 31 | Year: | 1983 |
| Driver Sex: | Male | Vehicle Make: | Toyota |
| Impalrment: | Fell Asleep | Vehicle Model: | Supra |
| Familiarity with Road: <br> No. of Occupants: | Unknown | ABS: | No |
|  | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 13 Neg <br> GV65: 12 Thi <br> GV66: 0 No <br> GV67: 0 No | voidance actions tiating a curve vehicle traveling of voidance maneuver voidance maneuver | road on the left side |  |

# CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Driver Relinquishes Steering Control - Fell Asleep <br> Left 

The subject vehicle was traveling in a southerly direction on a two-lane interstate entrance ramp. While traversing a long sweeping curve to the right, the driver fell asleep, allowing the vehicle to drift off the left edge of the ramp. The vehicle traversed along a steep, positive embankment for a short distance and then began arcing back toward the roadway. The right frontal area of the vehicle struck the back side of a W-beam guardrail. The vehicle rotated clockwise off this impact and came to rest upright, facing in an easterly direction.



```
CAUSAL FACTOR:' Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Left
```

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 4-1-93 | Weather: | Rain |
| Time: | 1800 | Surface Condition: | Wet |
| Accident Type: | Control/Traction Loss | Lighting: | Daylight |
| Accident Severity: | 1 (C) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 48 | Year: | 1975 |
| Driver Sex: | Male | Vehicle Make: | Chevrolet |
| Impairment: | Other (alcoh. consumption <br> - BAC unknown) | Vehicle Model: | LUV |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 5 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 08 Bra <br> GV64: 16 Suc <br> GV65: 50 Oth <br> GV66: 1 Tra <br> GV67: 4 Veh | ng and steering left <br> ssful avoidance of previous motor vehicle in lane, stopp king <br> cle departed roadway |  |  |

```
CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Left
```

The subject vehicle was traveling south along the right paved shoulder of a wet, ten-lane, divided, concrete interstate with a $+3 \%$ slope. The driver attempted to pass another vehicle by steering left, lost control of the vehicle, crossed the five south bound travel lanes and struck the median guardrail. The police reported the driver was inattentive and had been drinking with ability impaired. The ambient weather condition was rain which did not adversely affect the accident condition. The causal factors included inattention to the driving task, vehicle speed, and alcohol consumption.


Vehicle Dynamic Scenario


CAUSAL FACTOR: Lost Directional Control
ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 1-6-93 | Weather: | Clear/Cloudy |
| Time: | 1000 | Surface Condition: | Ice/Snow |
| Accident Type: | Control/Traction Loss | Lighting: | Artificial lighting |
| Accident Severity: | 0 (0) | Land Use: | Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 27 | Year: | 1992 |
| Driver Sex: | Male | Vehicle Make: | Pontiac |
| Impairment: | None | Vehicle Model: | Grand Prix (FWD) |
| Familiarity with Road: | Unknown | ABS: | Yes |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Level <br> 24 km/h |
| Cluster Variables |  |  |  |
| GV14: 03 Braking (lockup) |  |  |  |
| GV64: 13 Negotiating a curve |  |  |  |
| GV65: 05 This vehicle loss of control du |  | d conditions |  |
| GV66: 2 Skidding longitudinally - less |  | ees rotation |  |
| GV67: 4 Vehicle departed roadway |  |  |  |


| CAUSAL FACTOR: | Lost Directional Control |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |

The subject vehicle was traveling eastbound on a right curve of a two-lane roadway. The driver hit a patch of ice and skidded off the left side of the road. The vehicle impacted a trce. The speed limit for the roadway was $24 \mathrm{~km} / \mathrm{h}(15 \mathrm{mph})$. There was no injury to the driver.


CAUSAL FACTOR: $\quad$| Driver Relinquishes Steering Control - Physical |
| :--- |
| (seizure/passed out) |

ROADSIDE DEPARTURE:

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 2-5-93 <br> 1320 <br> Drive Off Road $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Daylight <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 67 <br> Male <br> Physical <br> (seizure/passed out) <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1971 <br> Nissan/Datsun <br> Pickup <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $40 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No <br> GV64: 13 Neg <br> GV65: 08 This <br> GV66: 0 No <br> GV67: 0 No | oidance actions iating a curve vehicle loss of control oidance maneuver oidance maneuver |  |  |

## CAUSAL FACTOR: Driver Relinquishes Steering Control - Physical (seizure/passed out) <br> ROADSIDE DEPARTURE: Right

The subject vehicle was traveling southbound on a two-lane street. The vehicle exited the road to the right and impacted the curb with its right side wheels. The vehicle traveled over the curb and became airborne. The driver suffered a heart attack.
PSU No. 82 Cose Number - Strotum 017K Indicote North (T)


Vehicle Dynamic Scenario


## CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol <br> ROADSIDE DEPARTURE: Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 3-5-93 | Weather: | Clear/Cloudy |
| Time: | 0535 | Surface Condition: | Dry |
| Accident Type: | Control/Traction Loss | Lighting: | Artificial lighting |
| Accident Severity: | 4 (K) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 20 | Year: | 1980 |
| Driver Sex: | Male | Vehicle Make: | Chevrolet |
| Impairment: | Intoxicated (alcohol/drugs) | Vehicle Model: | Citation |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Physical barrier | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Grade <br> $89 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 99 Unk <br> GV64: 01 Goi <br> GV65: 06 This <br> GV66: 9 Prec <br> GV67: 9 Dir | wn <br> straight <br> ehicle loss of control d <br> ash stability unknown <br> ional consequences unk | g too fast for conditions |  |

CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Vehicle Speed - Speed and Alcohol
Left

The subject vehicle was traveling on an eight-lane, divided interstate roadway at a police reported high rate of speed. The driver departed the inboard road edge and impacted the Jersey barrier with the left front corner of the vehicle. The vehicle yawed in a clockwise direction, mounted the barrier, and impacted a luminaire, which was mounted on top of the barrier, with the left front door area of the vehicle. The driver was intoxicated ( $\mathrm{BAC}=0.20$ ). Alcohol and excessive speed were the contributing factors to the crash.
PSU No. 82 Cose Number - Stratum O39B

## Vehicle Dynamic Scenario



CAUSAL FACTOR: $\quad$| Driver Relinquishes Steering Control - Physical |
| :--- |
| (seizure/passed out) |

ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 4-1-93 | Weather: | Rain |
| Time: | 0935 | Surface Condition: | Wet |
| Accident Type: | Drive Off Road | Lighting: | Daylight |
| Accident Severity: |  | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 71 | Year: | 1976 |
|  | Male | Vehicle Make: | Oldsmobile |
|  | Physical (seizure/passed out) | Vehicle Model: | Cutlass |
|  | Unknown | ABS: | No |
|  | 1 | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 2 | Alignment: <br> Slope: <br> Speed Limit: | Curve Right <br> Grade <br> $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No a <br> GV64: 13 Nego <br> GV65: 08 This <br> GV66: 0 No a <br> GV67: 0 No a | oidance actions tiating a curve vehicle loss of control oidance maneuver oidance maneuver |  |  |

CAUSAL FACTOR: Driver Relinquishes Steering Control - Physical (seizure/passed out)
ROADSIDE DEPARTURE: ..... Right

The subject vehicle was traveling in a westerly direction during daylight hours on a two-lane, right curved, asphalt road that was wet due to rain. The driver apparently passed out and relinquished control of the vehicle which drifted off the right road edge, traversed an asphalt parking lot, and impacted a loose pile of large timbers. The vehicle mounted the timbers and then struck a chain-link fence where it came to rest. A witness stated that the driver entered the right curve at an estimated speed of $48 \mathrm{~km} / \mathrm{h}(30 \mathrm{mph})$. There were no cars in the parking lot.



## CAUSAL FACTOR: Driver Relinquishes Steering Control - Intoxicated

ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | 4-1-93 <br> 1809 <br> Control/Traction Loss $3 \text { (A) }$ | Weather: <br> Surface Condition: <br> LIghting: <br> Land Use: | Rain <br> Wet <br> Daylight <br> Urban |
| Driver/Occupant Information |  | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 59 <br> Male <br> Intoxicated (alcohol/drugs) <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1986 <br> Chrysler <br> LeBaron <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Flush or curb <br> 3 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> 48 km/h |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 13 Negotiating a curve <br> GV65: 06 This vehicle loss of control due to traveling too fast for conditions <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

The subject vehicle was traveling in a northerly direction during daylight hours on a wet, concrete road surface in the outboard travel lane. The driver attempted to negotiate a left curve; however, the vehicle drifted toward the right road edge. The driver braked leaving right front tire skid marks on the road surface prior to departure. The vehicle mounted a barrier curb, traveled along a landscaped edge, and impacted a traffic signal/luminaire pole with the center frontal area. The driver was intoxicated ( $\mathrm{BAC}=0.33$ ).



CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol
ROADSIDE DEPARTURE: Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 5-1-93 | Weather: | Rain |
| Time: |  | Surface Condition: |  |
| Accident Type: | Drive Off Road | Lighting: | Artificial lighting |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 32 | Year: | 1978 |
| Driver Sex: | Male | Vehicle Make: | Oldsmobile |
| Impairment: | Other (alcoh. consumption - BAC unknown) | Vehicle Model: | Cutlass |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: |  | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Level <br> $56 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No a <br> GV64: 13 Nego <br> GV65: 06 This <br> GV66: 0 No a <br> GV67: 0 No a | oidance actions <br> tiating a curve <br> vehicle loss of control due to <br> oidance maneuver <br> oidance maneuver | g too fast for conditions |  |

## CAUSAL FACTOR: Vehicle Speed - Speed and Alcohol

ROADSIDE DEPARTURE: Right

The subject vehicle was traveling south through rain on a wet, two-lane, undivided, level, asphalt road illuminated by street lights. The driver failed to make the transition from a straight road segment to a left curve. The vehicle jumped the right, 15 cm high barrier curb and struck the down turned end of a W-beam guardrail. The vehicle mounted the rail, traversed along the top and struck a fence located behind the rail. The police reported the vehicle speed in excess of $129 \mathrm{~km} / \mathrm{h}(80 \mathrm{mph})$ and reported the driver's condition as had been drinking with ability impaired. The center lanes were mixed with solid and broken yellow lines in new condition for a one-lane, two way, turning channelization. The causal factor was vehicle speed with alcohol consumption.


Vehicle Dynamic Scenario


CAUSAL FACTOR:
ROADSIDE DEPARTURE:

Vehicle Speed - Speed and Alcohol
Left

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity: | 6-5-93 <br> 1714 <br> Control/Traction Loss $2 \text { (B) }$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Daylight <br> Urban |
| Driver/Occup | nt Information | Vehicle Info | nation |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 50 <br> Male <br> Other (alcoh. consumption <br> - BAC unknown) <br> Unknown <br> 1 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1975 <br> Dodge <br> B-series Van <br> No <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Not divided <br> 3 | Alignment: <br> Slope: <br> Speed Limit: | Curve Left <br> Grade <br> $48 \mathrm{~km} / \mathrm{h}$ |

## Cluster Variables

GV14: 06 Steering left
GV64: 01 Going straight
GV65: 61 Other vehicle encroaching into lane from adjacent lane (same direction) over right lane line
GV66: 1 Tracking
GV67: 4 Vehicle departed roadway

```
CAUSAL FACTOR:
ROADSIDE DEPARTURE:
```

Vehicle Speed - Speed and Alcohol
Left

The subject vehicle was traveling south on a dry, three-lane, urban, concrete road with a $-5.2 \%$ slope. The driver steered to the left in a left curve, jumped the left 15 cm high barrier curb and struck a tree and a utility pole. The center lane was marked to accommodate a two way turn lane with yellow solid/broken lines in good condition. The police indicated the driver was under the influence of alcohol. The driver claimed to have been cut off by an approaching vehicle. There were no adverse environmental conditions or sight line restrictions The causal factor was excessive speed and alcohol consumption..
PSU No. 82 Cose Number - Strotum 081F

## Vehicle Dynamic Scenario



CAUSAL FACTOR: ROADSIDE DEPARTURE:

Vehicle Speed - Speed and Alcohol
Right

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: | 6-4-93 | Weather: | Clear/Cloudy |
| Time: | 0530 | Surface Condition: | Dry |
| Accident Type: | Drive Off Road | Lighting: | Daylight |
| Accident Severity: | 3 (A) | Land Use: | Urban |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: | 19 | Year: | 1985 |
| Driver Sex: | Male | Vehicle Make: | Honda |
| Impairment: | Other (alcoh. consumption <br> - BAC unknown) | Vehicle Model: | Civic/CRX |
| Familiarity with Road: | Unknown | ABS: | No |
| No. of Occupants: |  | Defects: | No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): | Not divided | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $48 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions |  |  |  |
| GV64: 02 Slowing or stopping in traffic lane |  |  |  |
| GV65: 13 This vehicle traveling off the edge of the road on the right side |  |  |  |
| GV66: 0 No avoidance maneuver |  |  |  |
| GV67: 0 No | voidance maneuver |  |  |

# CAUSAL FACTOR: <br> ROADSIDE DEPARTURE: <br> Right <br> <br> \section*{Vehicle Speed - Speed and Alcohol} 

 <br> <br> \section*{Vehicle Speed - Speed and Alcohol}}

The subject vehicle was traveling on a dry, straight, level, four-lane, undivided, urban, asphalt roadway when the driver began to swerve back and forth in the right lane. The vehicle jumped the right 15 cm high barrier curb and struck a tree. The road was marked with full barrier yellow center lines and reflective road lane markers. The road edges were noted by barrier curbs. There were no adverse environmental conditions or sight line restrictions. The police listed the driver as under the influence of alcohol and drugs. The causal factor was vehicle speed with contributing factors of alcohol and drugs.


## Vehicle Dynamic Scenario



| CAUSAL FACTOR: | Driver Inattention |
| :--- | :--- |
| ROADSIDE DEPARTURE: | Left |

## General Accident Information

| General Accident Information |  |  |  |
| :---: | :---: | :---: | :---: |
| Date: <br> Time: <br> Accident Type: <br> Accident Severity | $\begin{aligned} & 5-6-93 \\ & 1956 \end{aligned}$ <br> Control/Traction Loss $4(\mathrm{~K})$ | Weather: <br> Surface Condition: <br> Lighting: <br> Land Use: | Clear/Cloudy <br> Dry <br> Daylight <br> Rural |
| Driver/Occupant Information |  | Vehicle Information |  |
| Driver Age: <br> Driver Sex: <br> Impairment: <br> Familiarity with Road: <br> No. of Occupants: | 17 <br> Female <br> None <br> Unknown <br> 4 | Year: <br> Vehicle Make: <br> Vehicle Model: <br> ABS: <br> Defects: | 1991 <br> Saab <br> 99/99E/900 <br> Unknown <br> No |
| Roadway Information |  |  |  |
| Trafficway Type (Median): <br> No. of Lanes: | Physical barrier <br> 1 | Alignment: <br> Slope: <br> Speed Limit: | Straight <br> Level <br> $80 \mathrm{~km} / \mathrm{h}$ |
| Cluster Variables |  |  |  |
| GV14: 01 No avoidance actions <br> GV64: 01 Going straight <br> GV65: 09 This vehicle loss of control due to unknown <br> GV66: 0 No avoidance maneuver <br> GV67: 0 No avoidance maneuver |  |  |  |

CAUSAL FACTOR: Driver Inattention
ROADSIDE DEPARTURE: ..... Left

The subject vehicle was traveling west bound in the left lane of a dry, four-lane, divided, rural, asphalt roadway when the driver veered left and struck the concrete median barrier. The vehicle was redirected across the road, rolled over and struck the right side 15 cm high barrier curb. The police indicated that the driver may have been distracted by the passengers and not paying attention to the driving task. There were no adverse weather conditions or sight line restrictions. The causal factor was driver inattention to the driving task.

Vehicle Dynamic Scenario



