Ford Inova Fairfax Hospital

CIREN Team

A Case Study in Offset Frontal Collision

Vehicle #1: 1998 Chevy Lumina 4door

Vehicle #2: 1999 Honda Civic 2door

Vehicle #1: Driver, Male

Safety Systems: AB only

Injuries: C_6 lamina fracture

left elbow laceration

right eyebrow laceration

left forehead abrasion

Vehicle #2: Driver, Male

Safety Systems: AB only

Injuries:

- left ulna fracture w/ radial head dislocation
- left patella fracture with PCL disruption
- left hip dislocation
- left thigh laceration
- left forearm laceration
- left cheek, hand, abdomen, & lower leg abrasions
- left shoulder contusion
- right knee joint laceration w/PCL rupture

Vehicle #1: (Lumina)

Weight: 3,330 lbs.

PDOF: 345

? V: 23.3

CDC: 11FYEW2

Max Crush: 46cm @ C6

Vehicle #2: (Civic)

Weight: 2513 lbs.

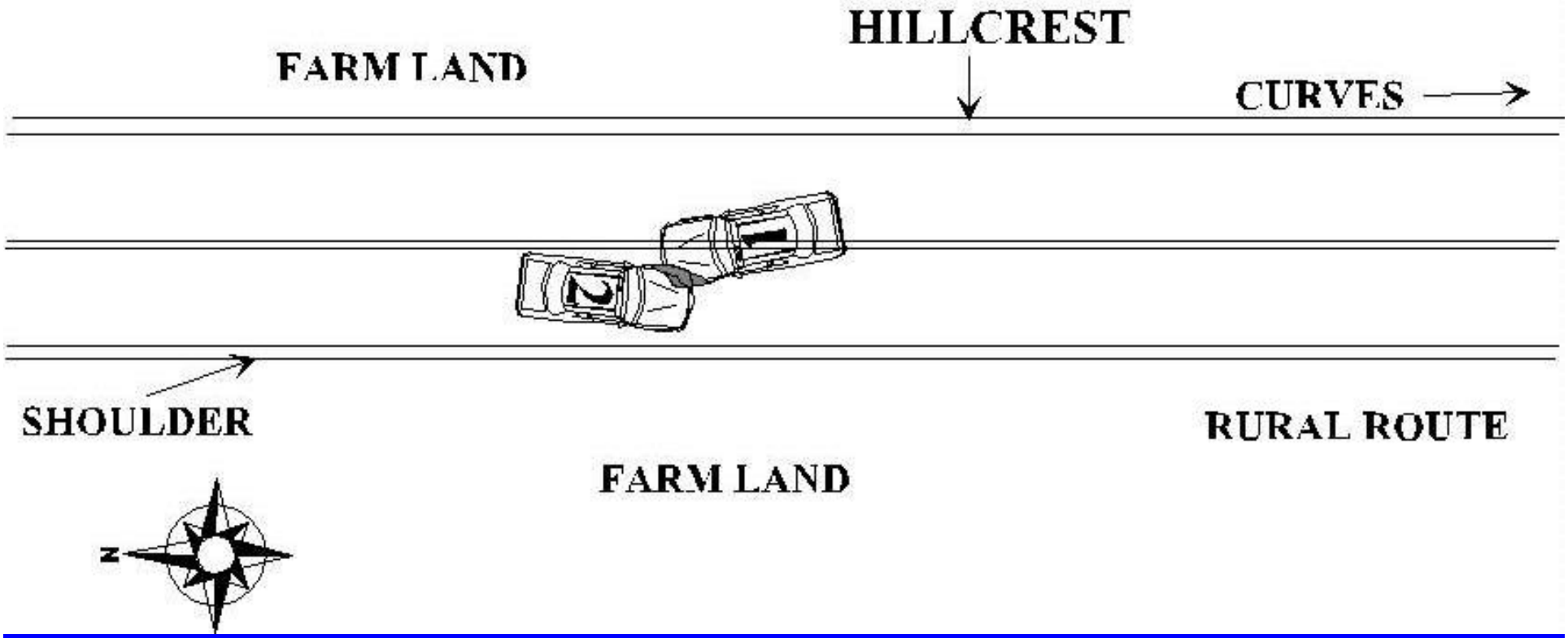
PDOF: 25

? V: 30.9

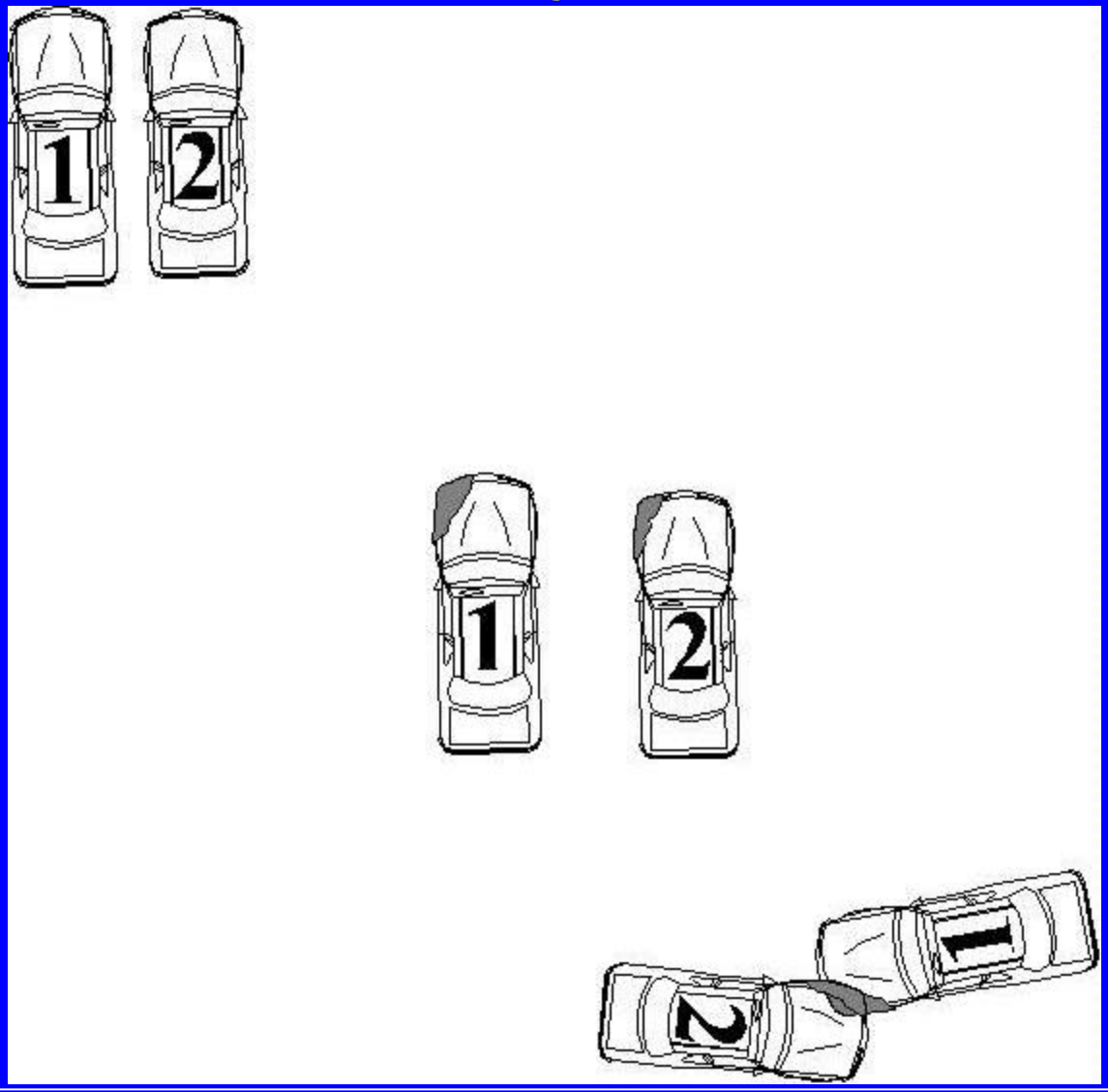
CDC: 01FYEW4

Max Crush: 119cm @ C1

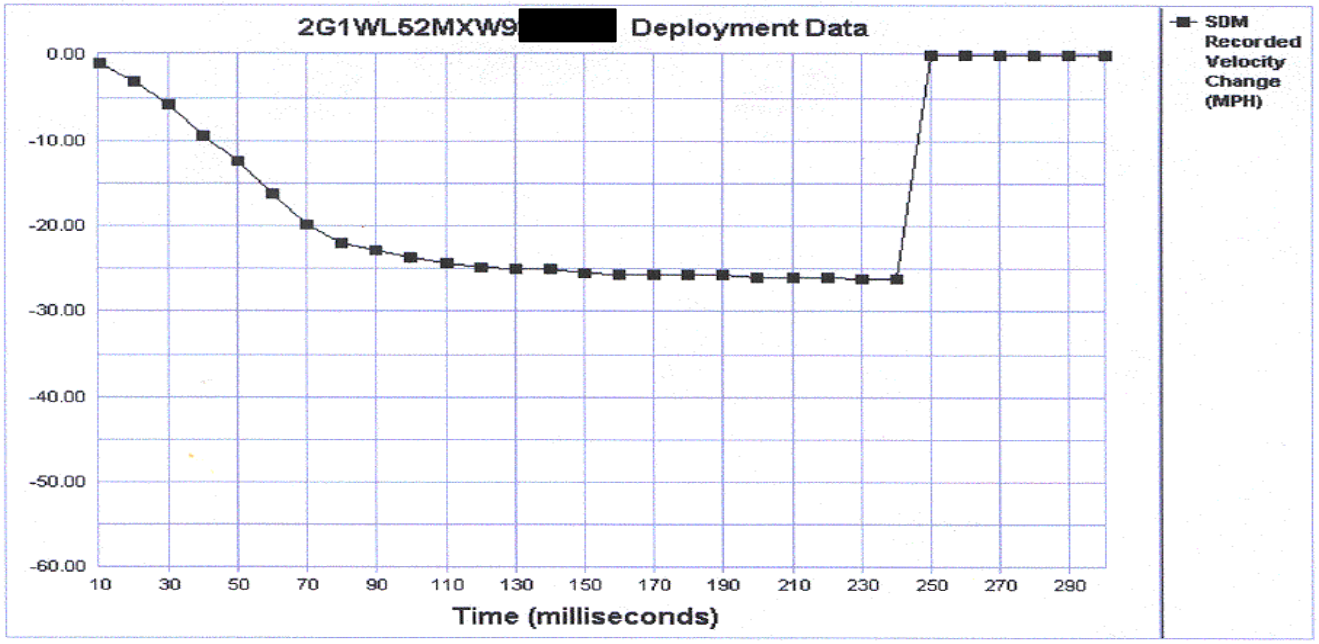
SCENE


HILLCREST
FARM LAND
CURVES
1
2
SHOULDER
RURAL ROUTE
FARM LAND
N

Vehicle Dynamics



Event Data Recorder - Vehicle # 1



2G1WL52MXW[redacted] System Status At Deployment	
SIR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	UNBUCKLED
Passenger Front Air Bag Suppression Switch Circuit Status	ON
Ignition Cycles At Deployment	0
Ignition Cycles At Investigation	5898
Time From Algorithm Enable To Deployment Command (msec)	17.5
Time From Near Deployment To Deployment (msec)	0

Recorded Velocity Change (MPH)	-0.88	-3.07	-5.70	-9.43	-12.29	-16.24	-19.75	-21.94	-22.82	-23.70	-24.35	-24.79	-25.01	-25.01	-2
Time (milliseconds)	160	170	180	190	200	210	220	230	240	250	260	270	280	290	3
Recorded Velocity Change (MPH)	-25.67	-25.67	-25.67	-25.67	-25.89	-25.89	-25.89	-26.11	-26.11	0.00	0.00	0.00	0.00	0.00	0.

Vehicle #1 Approach

Vehicle #1 Approach

Vehicle #1 Approach

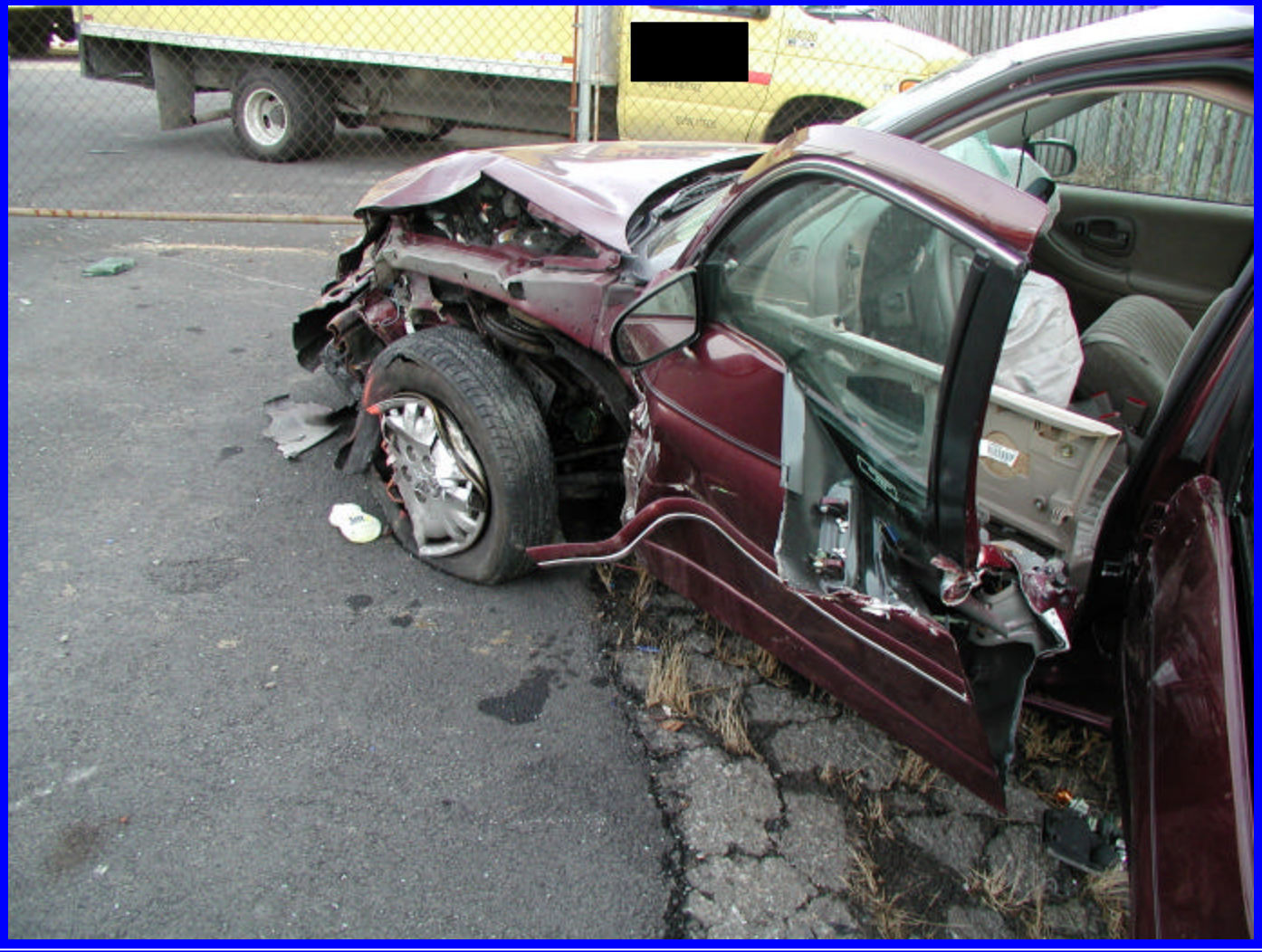
Vehicle #2 Approach

Vehicle #2 Approach

Vehicle #2 Approach

Vehicle #1

Vehicle #1



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Vehicle #1

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Vehicle #1

Vehicle #2

Vehicle #2

Vehicle #2

Ford Inova Fairfax Hospital CIREN Center

Vehicle #2

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Vehicle #2

Vehicle 1 Occupant

Age: 50
Gender: Male
Position: Driver
Restraint: Unbelted

Airbag front: Driver Side/Deployed

Clothing: Jeans/shirt/light jacket/heavy boots

Eyewear: Eyeglasses

Vehicle 1 Occupant

Injuries (ICD)	AIS Severity	Info Source	Aspect (R,L,bilat,etc)	Contact Area (door, seat,etc)	Mechanism (direct,etc)	Confid. Level	Rank
Loss of consciousness (850.1)	160202.2	Report	Whole	Roof-header	Direct	Probable	2
C-6 lamina fracture (805.06)	650224.3	CT	Posterior	Roof-header	Indirect	Probable	1
Forehead abrasion (873.42)	290202.1	Exam	Left	Roof-header	Direct	Probable	3
Elbow laceration (881.01)	790602.1	Exam	Left	Door panel	Direct	Possible	4
Eyebrow laceration (870.0)	290600.1	Exam	Right	Eyeglasses	Direct	Probable	5

Vehicle 2 Occupant

Age: 48
Gender: Male
Position: Driver
Restraint: Unbelted

Airbag front: Driver Side/Deployed

Clothing: Jeans/sweatshirt/light jacket/baseball hat
low top sneakers

Eyewear: Contacts

Vehicle 2 Occupant

Injuries (ICD)	AIS –90 Severity	Info Source	Aspect	Contact Area	Mechanism	Confid. Level	Rank
LOC in field (850.1)	160202.2	Report	N/a	Unknown	Unknown	Unknown	6
Cheek abrasion (910.0)	290202.1	Exam	Left	Door frame	Direct	Possible	8
Shoulder contusion (923.00)	751010.1	Exam	Left	Door frame	Direct	Possible	10
Ulna fracture (813.08)	753204.3	x-ray	Left	Door	Direct	Probable	2
Radial Head Dislocation (813.08)	750630.1	x-ray	Left	Door	Direct	Probable	2
Forearm laceration – 1 cm (881.0)	790602.1	Exam	Left	Door frame	Direct	Probable	7
Hand abrasion (914.0)	790202.1	Exam	Left	Roof	Direct	Probable	11
Abdominal abrasion (911.0)	590202.1	Exam	Left	Door frame	Direct	Probable	12
Hip Dislocation (835.0)	852600.2	x-ray	Left	Knee bolster	Indirect	Certain	1
Thigh laceration (890.0)	890602.1	Exam	Left	Door frame	Direct	Possible	9
Patella fracture (822.0)	8524002.2	x-ray	Left	Knee bolster	Indirect	Certain	4
PCL disruption (844.2)	840404.2	MRI	Bilateral	Knee bolster	Direct	Certain	3
Open knee joint laceration - (891.1)	850818.2	Exam	Right	Knee bolster	Direct	Certain	8
Leg abrasion (916.0)	890202.1	Exam	Left	Knee bolster	Direct	Probable	13