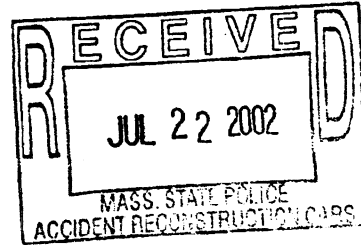


Massachusetts State Police
Collision Reconstruction Report

758 *AP*
7-15-02



Page 1

Collision #	EMO-02-02-Medway
Recon #	10.02
Photo #	
Lab #	

Open	
Pending Court	
Closed	

Complainant:	Medway Police Department	Phone:	508-533-3212
Complainants Address:	315 Village St. Medway, MA		
Date Rec'd:	01-10-02	Time Rec'd:	0930 HRS
		Type of Col:	PI
Primary Investigator:	Ofc. Kingsbury	Troop/Dept:	Medway PD
Reconstructionist Assigned:	Tpr. Edward M. O'Hara #2428	Team	NE #2
Collision Occurred:	Medway	Norfolk	Wednesday
	01-09-02		1312 HRS
	City/Town	County	Day
			Date
			Time

Synopsis

1. On 01-10-02 at approximately 0930 HRS I was advised by Lt. O'Connell, HHQ, that the Medway Police Department was requesting the assistance of the Collision Analysis and Reconstruction Section with the investigation of a serious motor vehicle collision which had occurred on Milford Street in their town. I contacted Medway PD and spoke to Officer Kingsbury who advised me that the collision had occurred on 01-09-02 at approximately 1312 HRS.

2. I responded to Medway PD and met with Officer Kingsbury. Officer Kingsbury and I then responded to the scene of the collision. Upon arrival at the scene, Officer Kingsbury related the observations he had made upon his arrival on the scene, immediately after this collision. I then made observations and took measurements.
3. Vehicle #2, a 1997 Toyota Corolla, Massachusetts Registration #787-ELO was travelling east on Milford Street in the Town of Medway. Vehicle #2 was stopped at Trotter Drive, at the direction of a police officer directing traffic at a roadwork site on Milford Street, east of the scene of this collision.
4. Vehicle #1, New Jersey Apportioned Registration #AD870W, a 1999 Freightliner Tractor, pulling a 2000 Brenner Tank Trailer, New Jersey Trailer Registration #T76H6V, fully loaded with liquid asphalt, was traveling east on Milford Street in the Town of Medway in the area of Trotter Drive.
5. The right front side of Vehicle #1 struck the rear of Vehicle #2. Vehicle #1 steered to the left and began braking.
6. Vehicle #2 was propelled forward and to the right and began to rotate clockwise. Vehicle #2 crossed the right fog line; left the south edge of the roadway traveled through brush on the roadway edge and struck a tree with its left rear quarter.
7. Vehicle #2 then slid down an embankment on the side of the roadway and came to final rest facing south. Vehicle #1 skidded to final rest in the eastbound travel lane of Milford Street, facing east.
8. The operator of Vehicle #1 was not injured in this collision. The operator of Vehicle #2 sustained serious injuries as a result of this collision.
9. On 01-10-02 at approximately 1200 HRS I conducted a vehicle inspection of Vehicle #1 and its trailer at GAF Industries in Millis. On 01-10-02 at approximately 1305 HRS I conducted a vehicle inspection of Vehicle #2 at John's Auto in Medway. On 01-11-01 I returned to John's Auto in Medway to complete the inspection of Vehicle #2. Tpr. J. Jaworek of the Commercial Vehicle Enforcement Section responded to the scene shortly after this collision and conducted an inspection of Vehicle #1.

Roadway

10. Milford Street, also known as Rt. 109 in the Town of Medway in the area of this collision is a two lane roadway which runs generally east and west. There is one lane in the eastbound direction and one lane in the westbound direction. The opposite travel lanes are separated by two solid yellow lines. Both travel lanes were measured to be approximately 12 feet in width. There are two-foot paved shoulders on both the north and south side of the roadway. These shoulders are delineated by a solid white fog line. On the south edge of the roadway there is a dirt shoulder, which leads to a dirt embankment with a grade measured to be approximately 60 percent.
11. The speed limit on Milford Street for eastbound traffic in the area of this collision is posted at 40 MPH. Milford Street is a public way and is maintained by the Town of Medway. The roadway surface in the area of this collision consists of asphalt and is generally straight and flat and appeared to be in good condition. There is a downgrade to Milford Street west of the collision scene.

12. The approximate weather conditions at the time of this collision consisted of cloudy skies with a temperature of approximately 40 degrees Fahrenheit. The roadway surface was dry.

Roadway Evidence

13. Upon my arrival at the scene I observed that no marks had been placed to indicate the roadway evidence. Officer Kingsbury identified a dual wheel slid mark in the eastbound travel lane as belonging to the left rear #5 axle of Vehicle #1. Skid Mark #1 was located on the left side of the eastbound travel lane and curved gently to the left. Skid Mark #1 began approximately at the centerline of the intersection of the northbound travel lane of Trotter Drive, traveled for a distance measured to be approximately 109 feet and ended at the centerlines of Milford Street. Officer Kingsbury advised me that this was the point of final rest for the left side tires of Axle # 5 on Vehicle #1.
14. I observed there to be a scuff mark on the south edge of the roadway which then crossed onto the dirt shoulder. I then observed Scuff Mark #1 to continue down the dirt embankment on the south side of the roadway. Scuff Mark #1 ended in an area of disturbed dirt with motor vehicle debris scattered around the area. This area was on the south side of a tree, which had scrapes on its trunk. Officer Kingsbury identified this area as the position of final rest for Vehicle #2. Scuff Mark #1 was measured to be a total length of 43 feet. Scuff Mark #1 crossed three surfaces, 15 feet on the asphalt roadway, 17 feet on the dirt shoulder and 11 feet down the dirt embankment.
15. I observed there to be a debris field of broken motor vehicle lens on the south edge of the roadway at the intersection with the northbound lane of Trotter Drive. I observed a second area of motor vehicle lens debris, on the south shoulder of Milford Street at the east corner of the intersection with Trotter Drive. There were no scratches or gouges observed to the roadway at the time of my arrival. An exact area of impact could not be determined based on roadway evidence.
16. Officer Kingsbury advised me that the officer assigned to the construction detail, Medway Police Sgt. Boultenhouse, advised him that Vehicle #2, upon his signal to stop had come to a stop on Milford Street at approximately the east corner of the intersection of Trotter Drive.
17. Skid Mark #1 was measured to begin approximately 44 feet west of the start of Scuff Mark #1. The start of Skid Mark #1 was measured to be approximately 40 feet east of the first area of motor vehicle debris. The start of Skid mark #1 was measured to be approximately 33 feet west of the second area of motor vehicle debris.
18. Using subjective analysis, I observed that the minimum sight distance of the area of the collision available, for a vehicle approaching from the west, was approximately 750 feet. This analysis was done on a cloudy day with similar conditions and from my cruiser while travelling east on Milford Street.

Operator Data Vehicle #1

Name: Zalewski, Carlo
Address: 50 Beacon Light Avenue
Keansburg, NJ 07734
DOB: 04-23-44
License #: NJ Z02751100004442
Injuries: None

Owner Data Vehicle #1

Name: Penske Truck Leasing Company
Address: 1800 Hylton Road
Pennsauken, NJ

Tractor

Yr/Make/Model: 1999 Freightliner Tractor
Reg/State/Type: NJ Apportioned Registration #AD870W
VIN: 1FUYDCYB9XLB63880

Vehicle #1 Inspection

The following vehicle inspection was conducted at GAF Industries, Millis at approximately 1200 HRS.

Exterior

There was contact damage to the right front corner and the fiberglass was broken away. The right side of the front bumper was pushed inward and up. Right front headlight assembly was out of its holder. The right headlight was missing. The right front quarter panel was broken away in front of the right front tire.

There was contact damage to the front grill and front bumper. The right side air dryer and pipe were broken away from the mount and pushed rearward and upward.

There was induced damage to the left side of the front bumper. There was red taillight lens pieces located on the front bumper at the front grill area. There was blue transfer to the front end, to the right of the grill and to the right front corner

Interior

Mileage: 420,178
 Speedometer: 0
 Ignition: Off
 Seatbelt Used: Unknown. Operator's seatbelt shows signs of wear.
 Airbag equipped: No
 Air conditioning/heat: Heat on Hot Defrost. Fan Off.
 Radio: Off
 Headlight switch: Off. Functions properly.
 Wipers: Off. Functions properly.
 Windows: All Up.
 GVW: 80,000 Lbs.
 Inspection Sticker: New Jersey Diesel Inspection Sticker #D170011. Expired: 09/2002
 USDOT Sticker #510003
 Windshield: Intact and clean.
 Damage: No collision related interior damage observed.
 Appearance: There was a brown paper bag on the floor between the seats with a full cup of cold coffee. The cups cover was still intact

Mechanical

Engine: Diesel
 Transmission: Standard

Brakes

Tpr. Jaworek of the Commercial Vehicle Enforcement Section conducted an inspection of Vehicle #1. This inspection included examination of the brakes. Tpr. Jaworek found that the right #5 brake was inoperable at the time of his inspection. (See Tpr. Jaworek's report.)

Tire Inspection

Location	Make	Type	Size	Tread	Pressure(PSI)
Left Front	Bridgestone	R250	11R22.5	Good	Good
Right Front	Bridgestone	R250	11R22.5	Good	Good
Left Rear #1	Good Year	G362	11R22.5	Good	Good
Left Rear #2	Good Year	G362	11R22.5	Good	Good
Left Rear #3	Bridgestone	MX3711	11R22.5	Good	Good
Left Rear #4	Bridgestone	MX3711	11R22.5	Good	Good
Right Rear #1	Good Year	G362	11R22.5	Good	Good
Right Rear #2	Good Year	G362	11R22.5	Good	Good
Right Rear #3	Bridgestone	MX3711	11R22.5	Good	Good
Right Rear #4	Bridgestone	MX3711	11R22.5	Good	Good

Lamp Inspection

The right front headlight assembly was out of position and the right front headlight was missing from collision damage.

Vehicle #1 Trailer Inspection

Name: Penske Truck Leasing Company
Address: 1800 Hylton Road
Pennsauken, NJ

Yr/Make/Model: 2000 Brenner Tank Trailer #5780137
Reg/State/Type: NJ Trailer Registration #T76HV
VIN: 16BBC72Y94M0M2800

Placard: #3257, HOT
Hazardous Rating: 9 (Hot Material)
Inspection: Sticker dated 05-25-00
Maximum Load: 51,600 LBS
GVWR: 29,484 LBS
Brakes: ABS
Load: Officer Kingsbury advised that the trailer was fully loaded with liquid asphalt at the time of this collision.

Exterior

There was old contact damage to the left side in the area of the loading platform. The tank is dented and split approximately 4 feet long and there is insulation exposed. There was a dent to the left rear side of the tank over the rear wheels. This appeared to be old damage.

Tires

The tires of the trailer all appeared to have proper inflation and tread. No defects were observed.

Operator Data Vehicle #2

Name: Rhodes, Marcia G.
Address: 11 Janock Road
Milford, MA 01757
DOB: 06-22-55
License #: Massachusetts Operator #158502605

Injuries: The operator of Vehicle #2 sustained serious injuries as a result of this collision.

Owner Data Vehicle #2

Name: Rhodes, Marcia G.
Address: 11 Janock Road
Milford, MA 01757
DOB: 06-22-55

Yr/Make/Model: 1997 Toyota Corolla
Reg/State/Type: Massachusetts Passenger Registration #787-ELO
VIN: 2T1BA02E9VC178274

Vehicle #2 Inspection

The following vehicle inspection was conducted at John's Auto, Medway on 01-10-02 at approximately 1305 HRS and continued on 01-11-02 at approximately 0930 HRS.

Exterior

There was significant contact damage to the rear end of Vehicle #2. The damage overrode the trunk floor and rear frame rails. The trunk lid was pushed forward into the rear window frame. The rear left frame rail was bent upward and twisted forward so that the rear end of the frame rail was pointing forward.

The trunk area was pushed through the rear seat area into the front seats. There was minor contact damage from a tree to the left rear quarter. There was induced and rescue damage to the left side doors. There was induced and rescue damage to the roof. The roof was peeled back and is cut at the A-pillars and B-pillars. The windshield was out of its frame from rescue damage.

There were scratches to the right front quarter from striking brush. There was induced damage to the right side doors; both doors were jammed shut. There was contact and induced damage to the right rear quarter and there was induced damage to the right C-Pillar.

Interior

Mileage: 54,698
Speedometer: 0
Ignition: Off
Seatbelt Used: The seatbelts are worn and stretched indicating that they were worn regularly. It is inconclusive as to whether the operator of Vehicle #1 was wearing the seatbelt at the time of this collision. ✓
Airbag equipped: Yes.
Headlight switch: Off
Windows: Rear window is shattered.
Inspection Sticker: Unreadable.
Windshield: Missing from frame. Rescue damage.

Interior Damage

The interior of Vehicle #2 sustained major damage in this collision. The floor was buckled forward. The trunk and rear seat were pushed forward into the front seats. The front seats were buckled.

Mechanical

Transmission: Automatic in Park position
Brakes: Front disc, rear drum. No pre-impact defects noted.
Steering: No pre-impact defects noted.

Tire Inspection

Location	Make	Type	Size	Tread	Pressure(PSI)
Left Front	Good Year	Invecta	P175/65R14	Good	Good
Right Front	Good Year	Invecta	P175/65R14	Good	Good
Left Rear	Sears	Super Guard	P175/70R14	Good	Flat*
Right Rear	Good Year	Invecta	P175/65R14	Good	Flat*

*Flat from collision damage.

Lamp Inspection

The rear lights were seriously damaged as a result of this collision. All the rear light bulbs were broken except for the rear high mount stoplight.

The right and left side brake light filaments were damaged but intact and revealed hot shock. This indicates that these filaments were incandescent at the time they sustained an impact. The rear mount stop light housing and the bulb were intact and this filament indicated hot shock. This means that this bulb was incandescent at the time it sustained an impact.

Collision Analysis

19. Vehicle #1 was travelling east on Milford Street in the Town of Medway approaching the intersection with Trotter Drive.
20. Simultaneously, Vehicle #2 was travelling east on Milford Street and had stopped at a construction zone at the direction of a police officer assigned to the construction zone. Vehicle #2 was stopped at the intersection of Milford Street and Trotter Drive, approximately even with the northbound travel lane of Trotter Drive
21. The right front end of Vehicle #1 struck the rear of Vehicle #2 offset slightly to the left. Vehicle #2 skidded forward and to the right. Vehicle #2 skidded off the south edge of the roadway across the dirt shoulder, began rotating clockwise and slid down a steep embankment through light brush. Vehicle #2 then struck a tree with its left rear quarter panel and came to final rest against the tree, facing generally southeast.

22. After impact, Vehicle #1 applied braking and skidded to the left and came to final rest with its tractor facing generally northeast in the westbound travel lane and its trailer partially in the westbound travel lane and partially in the eastbound travel lane.

Calculations

Calculate the coefficient of friction of the roadway.

23. The coefficient of friction was measured using a 44 Lb. drag sled. Using three pulls, the pull force was measured to be approximately 32 LBS. Using the coefficient of friction formula, the coefficient of friction of the roadway in the area of this collision was calculated to be approximately .72

$$f = \frac{F}{W}$$

$$f = \frac{32.00}{44.00}$$

$$f = 0.72$$

$$f = f \times n$$

$$f = 0.72 \times 1.00$$

$$f = 0.72$$

f = The Acceleration/Drag Factor.

F = The Pull Force in Pounds.

W = The Weight in Pounds.

n = The Percentage of Braking.

Calculate the adjusted coefficient of friction for Vehicle #1.

24. Tpr. Jaworek reported that his brake inspection of Vehicle #1 revealed that the right brake on axle #5 was inoperative. The normal braking efficiency of a tractor-trailer unit is approximately 70 percent with full braking. The right brake on axle #5 provided 6 percent of the available braking. Because the right brake on axle #5 was inoperative, the braking efficiency for Vehicle #1 is approximately 64 percent.

25. Using the braking percentage of 64 percent, the adjusted coefficient of friction for Vehicle #1 on the roadway in the area of this collision was calculated to be approximately .46

$$f = f \times n$$

$$f = 0.72 \times 0.64$$

$$f = 0.46$$

f = The Adjusted Accel/Drag Factor.

n = The Percentage of Braking.

Calculate the minimum speed loss of Vehicle #1 from skidding post impact.

26. Officer Kingsbury advised me that Skid Mark #1, was from the left rear tires of the trailer, which Vehicle #1 was pulling. Skid Mark #1 was measured to be approximately 109 feet in length. Using the skid distance of approximately 109 feet and the calculated adjusted coefficient of friction of .46, the minimum speed loss from skidding for Vehicle #1 was approximately 38.78 MPH

$$S = \sqrt{30 \times D \times f}$$

$$S = \sqrt{30 \times 109.00 \times 0.46}$$

$$S = \sqrt{1504.20}$$

$$S = 38.78$$

S = The Speed in MPH

30 = A Constant.

D = The Distance in Feet.

f = The Adjusted Accel/Drag Factor.

Conclusions

27. Vehicle #1 was travelling east on Milford Street, Rt. 109 in the Town of Medway. Vehicle #2 was also travelling east on Milford Street east of Vehicle #1. Vehicle #1 came to a stop in the eastbound travel lane at a road construction site at the direction of police officer assigned to direct traffic around the construction. Vehicle #1 approached Vehicle #2 from the rear, failed to stop and struck the rear of Vehicle #2.
28. Vehicle #2 skidded off the roadway to the right and struck a tree on the south side the roadway. After impact, Vehicle #1 applied braking, moved left and came to final rest partially in the westbound travel lane.
29. The left rear brake of Vehicle #1 locked, leaving a skid mark approximately 44 feet west of the scuff mark left by Vehicle #2 as it left the roadway after impact. The skid mark for Vehicle #1 began approximately 40 feet east of (after) the first debris field observed at the scene. This skid mark began approximately 33 feet west of the second debris field located on the right dirt shoulder of the roadway.
30. There were road construction vehicles and equipment in the roadway. The rear brake lights of Vehicle #2 revealed hot shock indicating that they were incandescent at the time they sustained a shock.
31. I arrived at the scene approximately 20 hours after this collision occurred. There were no markings made at the scene prior to my arrival. A precise area of impact was not able to be determined.
32. The minimum speed loss of Vehicle #1 from skidding was calculated to be approximately 38 MPH. This speed does not include any speed loss, which may have occurred from striking Vehicle #2. Because of the weight difference between the two vehicles involved in this collision, the speed loss for Vehicle #1 from striking Vehicle #2 would be minimal. The posted speed limit for the eastbound traffic on Milford Street is posted at 40 MPH.

Opinion

33. It is my opinion that the cause of this collision was the failure of the Operator of Vehicle #1, Carlo Zalewski to use care in braking.
34. It is my opinion that driver inattention and/or driver distraction on the part of Mr. Zalewski was a significant factor in this collision. It is my opinion based on the location of the skid mark of Vehicle #1, that the operator of Vehicle #1 did not lock the brakes until impact or after impact with Vehicle #2
35. It is my opinion that the inoperative right brake on axle #5 of Vehicle #1 was not a major factor in this collision.

Respectfully Submitted,

**Tpr. Edward M. O'Hara #2428
Massachusetts State Police
Collision Analysis & Reconstruction Section**