



STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION



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Phone:

March 5, 2015

Dockets Management Facility
U.S. Department of Transportation
W12-140, 1200 New Jersey Avenue, SE
Washington, DC 20590-0001
Via: <http://www.regulations.gov>

RE: Docket No. FHWA-2014-0039, ET-Plus Guardrail End Terminal

To Whom it May Concern:

The Connecticut Department of Transportation (Department) is providing the following technical data in response to the request for information regarding the ET-Plus Guardrail End Treatment. The Department has performed a statewide inventory of these end treatments, identifying approximately 243 locations where either system ET-Plus/2000 is currently in service.

ET-Plus Crash Data and Information – Six locations have been identified where crashes involved a vehicle impacting an ET-Plus Guardrail End Treatment. Enclosed for each location are collision reports containing crash narratives, diagrams, pre-crash images from our annual network data collection, and pictures taken at the time of the repair, if available. Many crash factors are unknown, such as vehicle speed, angle of impact, existing roadway and shoulder condition at the time of the crash.

ET-Plus Dimensions as Installed – Approximately 193 ET terminals have a four-inch wide channel. The remaining 50 systems have a five-inch wide channel. No other dimensions have been measured.

If you have any questions, please contact Mr. Leo Fontaine, Principal Engineer, at (860) 594-3180.

Very truly yours,

A handwritten signature in blue ink, which appears to read "Thomas A. Harley".

Thomas A. Harley, P.E.
Chief Engineer

Enclosures

	Connecticut DOT's ET-Plus vehicle crash experience at
Route	Rte 2 EB
Milepost	5.36
Location Description	Rte 2 EB Exit 8 " Rte 94 Hebron Ave" off ramp Gore Area
Roadway type	Limited access highway with an asphalt pavement surface
Date of Accident	1/5/2015
Crash Narratives	No Accident report
Crash Diagrams	No Accident report
Crash Severity	Vehicle drove away - no accident report on file
Vehicle mass	unknown
Vehicle speed	unknown
Angle of impact of the vehicle	unknown
Orientation of vehicle at impact	unknown
Weather	Damage discovered after a snow storm
Condition of shoulder/roadside	unknown
Installation/Maintenance History	System installed in 2009 - Maintenance History unknown
Terminal Condition	Provided image from 2014 state's network collection effort dated July 23, 2014 and pictures of system at time of repair after the non-reported accident



Connecticut -Route 2 Eastbound at Mile Post 5.36 – Photolog Picture of system taken prior to accident

Pictures at time of repair



State Police Crash Diagram & Narrative

Vehicle drove away, no accident report on file

Connecticut DOT's ET-Plus vehicle crash experience at	
Route	I-91 NB
Milepost	0.49
Location Description	I-95 NB Entrance Ramp 2 - ramp left side
Roadway type	On ramp with Asphalt Pavement surface
Date of Accident	12/16/2014
Crash Narratives	Yes
Crash Diagrams	Yes
Crash Severity	PDO
Vehicle mass	2004 Ford Focus
Vehicle speed	unknown
Angle of impact of the vehicle	vehicle veered of roadway (angle unknown) hitting the impact system and coming to rest passed the attenuator
Orientation of vehicle at impact	Head on
Weather	12:42 pm Weather was clear, road surface slightly wet and Traffic was light
Condition of shoulder/roadside	Unknown
Installation/Maintenance History	System installed in 2014 Construction Season
Terminal Condition	Provided photos of the system after the accident.

No Pictures of the system are available prior to the accident

Pictures at time of repair







State Police Crash Diagram & Narrative

Page 2 of 6

Subject: I-91 MP 0.49 Entrance Ramps 12-16-13

CONNECTICUT UNIFORM POLICE CRASH REPORT

Form PR-1 REV July 2014.01

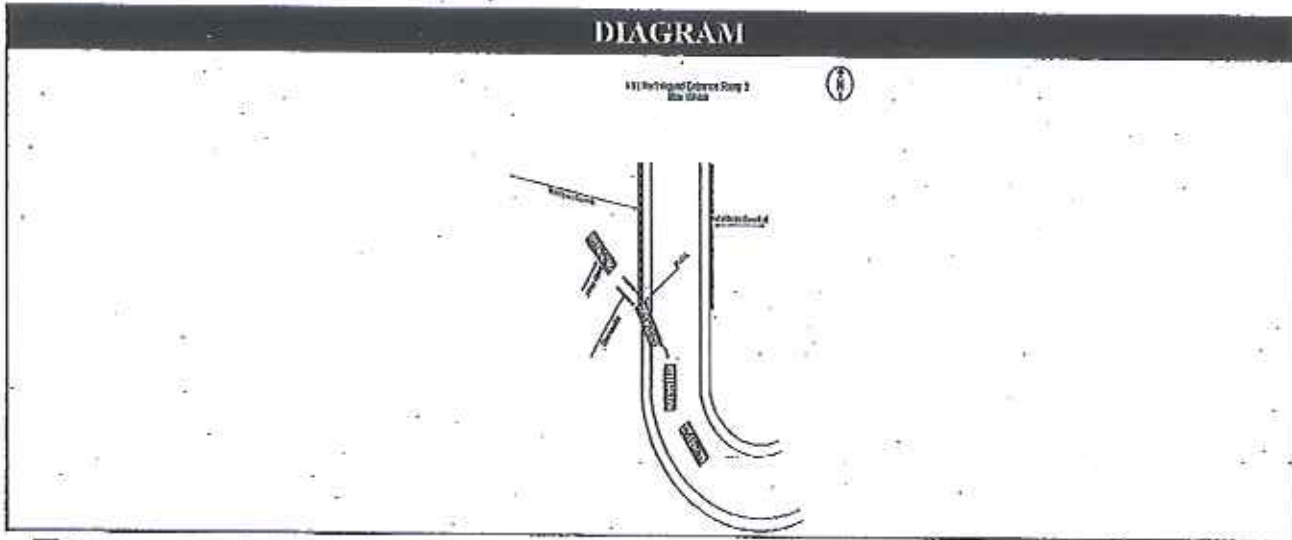
Crash Summary (Back)

Case Number

DOT Identifier:

For DOT use only

DIAGRAM



Vehicles were moved prior to police arrival

NARRATIVE

Officers Narrative: Describe any unusual circumstances associated with the crash, including officer's observations. Refer to each by motor vehicle number and/or non-motorist number

Vehicle #1 was travelling North on the I-91 Northbound entrance ramp 2. Vehicle #1 lost control, veered left and struck the metal beam guardrail located on the left shoulder of the entrance ramp. No injuries were reported. At the time of this accident, the roadway slightly wet, traffic was light and the weather was clear.

Operator #1 stated she was travelling north on the I-91 entrance ramp 2. She stated her vehicle did not stop and she veered left into the metal beam guard rail. She stated she was not travelling fast but did not know her speed. She stated she was not distracted or on the cellular at the time of the collision. Operator #1 reported no injuries.

Upon my arrival, I observed the front end of vehicle #1 to be heavily dented. The front bumper was detached, the right fender metal was torn off by the metal beam guardrail collision. I observed the metal posts and approximately 10 feet of metal beam guardrail damage. I observed tire marks in the left shoulder area where it was muddy. The tire marks did not indicate vehicle #1 negotiating a turn at the time of the collision. All damage was consistent with a vehicle striking a metal beam guardrail.

	Connecticut DOT's ET-Plus vehicle crash experience at
Route	I-95 NB Exit 21
Milepost	24.26
Location Description	I-95 NB Exit 21 " Mill Plain Road" off ramp left side
Roadway type	Off ramp with Asphalt Pavement surface
Date of Accident	6/18/2011
Crash Narratives	Yes
Crash Diagrams	Yes
Crash Severity	PDO
Vehicle mass	2007 Mercury
Vehicle speed	40 mph
Angle of impact of the vehicle	head-on
Orientation of vehicle at impact	front corner
Weather	4:47 am No adverse weather conditions, road surface wet and Traffic was light
Condition of shoulder/roadside	Unknown
Installation/Maintenance History	System Installed 1/31/08 - Entire system was replaced after crash
Terminal Condition	Provided image from state's network collection effort dated August 10, 2010



Connecticut -Route I-95 Northbound at Mile Post 24.26 – Photolog Picture of system taken prior to accident

Pictures at time of repair

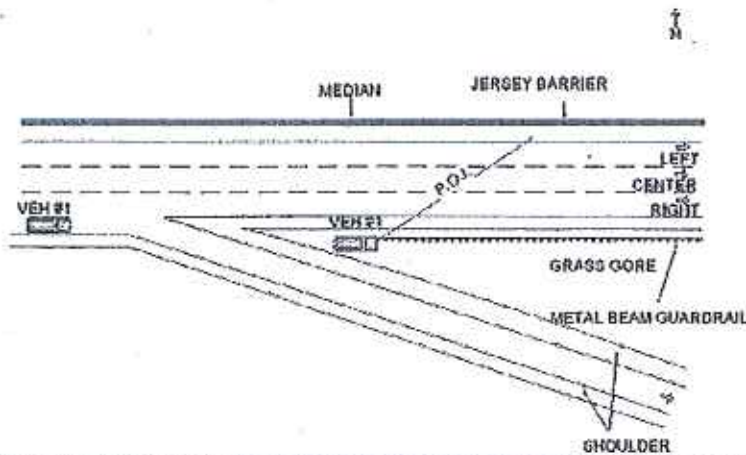
No Pictures available of the system at the time of the repair

State Police Crash Diagram & Narrative

Subject: I-95 NB MP 24.2 OFF Ramp 6/18/11

Diagram

I-95 NORTHBOUND
EXIT 21 OFF RAMP



Officer's Narrative

Vehicle #1 was traveling on the I-95 northbound exit 21 off ramp. Vehicle #1 lost control and struck the metal beam guardrail located on the gore area. No injuries were reported.

Operator #1 stated that he was traveling on the I-95 northbound exit 21 off ramp at approximately 40 MPH. He stated that he lost control of his vehicle and struck the metal beam guardrail located on the gore area. Operator #1 stated that he knew that his license was suspended in New York but didn't know that it was suspended in Connecticut. He stated that he wasn't injured.

Upon arrival there were no adverse weather conditions, the road surface was wet and traffic was light. I observed Vehicle #1 in the grass area of the gore area of the exit 21 off ramp. I observed Vehicle #1 with damage to the front end and damage to the left side. The damage was consistent with a collision with a metal beam guardrail. I observed approximately 20 feet of metal beam guardrail damaged on the gore area of the off ramp. A COLLECT records check revealed that Operator #1 had a suspended license as of 02-09-11.

Based on my investigation, operator statement and the physical evidence at the scene, I determined that Operator #1 was at fault for failing to maintain an established lane. Operator #1 was issued a Misdemeanor summons for C.G.S. 14-215, Operation of a Motor Vehicle With a Suspended License and C.G.S. 14-236, Failure to Maintain Lane.

	Connecticut DOT's ET-Plus vehicle crash experience at
Route	I-95 NB
Milepost	24.26
Location Description	I-95 NB Exit 21 " Mill Plain Road" off ramp left side
Roadway type	Off ramp with Asphalt Pavement surface
Date of Accident	3/15/2013
Crash Narratives	Yes
Crash Diagrams	Yes
Crash Severity	PDO
Vehicle mass	passenger vehicle
Vehicle speed	unknown
Angle of impact of the vehicle	The vehicle swerved from center lane (angle unknown) hitting the impact system causing the vehicle to overturn on its roof sliding back across the highway coming to an uncontrolled final rest in the center lane facing easterly.
Orientation of vehicle at impact	head on
Weather	5:08 am Weather was clear, road surface dry and Traffic was light
Condition of shoulder/roadside	Unknown
Installation/Maintenance History	Entire system was replaced after June 18, 2011 crash
Terminal Condition	Provided image from state's network collection effort dated November 11, 2012



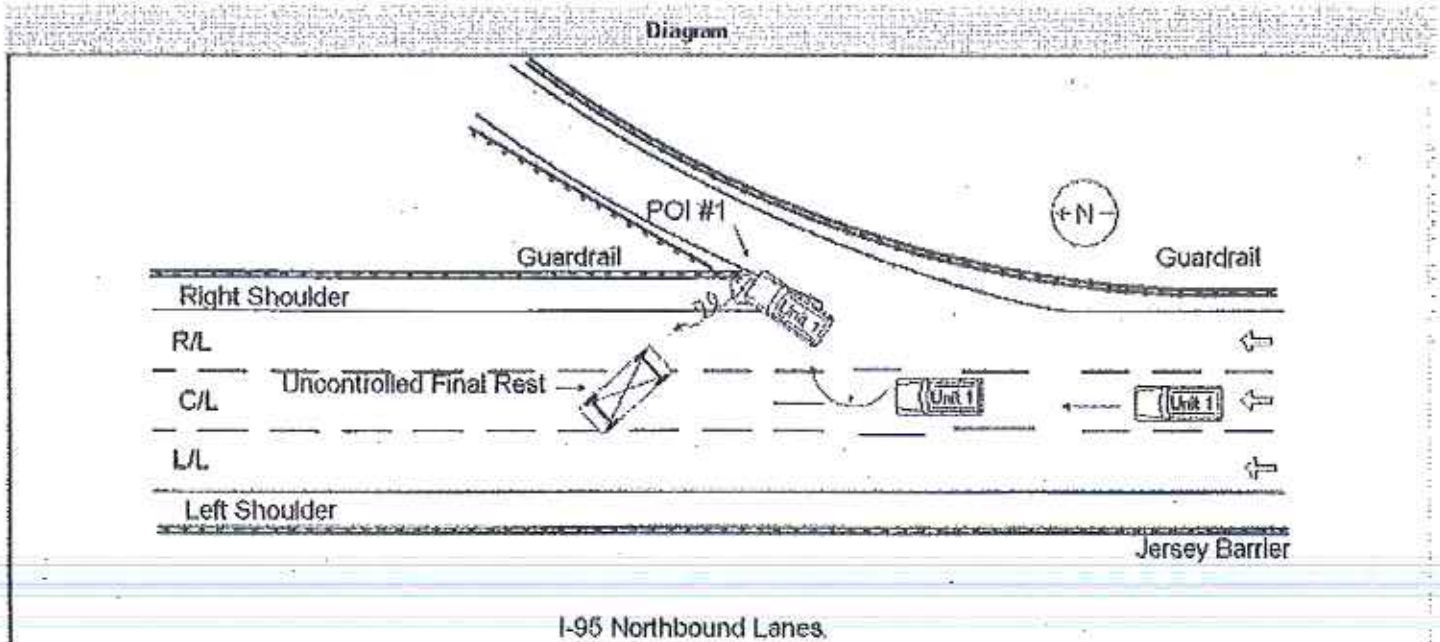
Connecticut -Route I-95 Northbound at Mile Post 24.26 – Photolog Picture of system taken prior to accident

Pictures at time of repair

No Pictures available of the system at the time of the repair

State Police Crash Diagram & Narrative

Subject: I-95 NB MP- 24.2 off ramp 3/15/13



Officer's Narrative

Vehicle #1 was traveling northbound on I-95 in the center lane. While in motion, operator #1 swerved from the center lane towards the right shoulder of the roadway. Vehicle #1 struck the Metal beam guard rail in the right shoulder causing vehicle #1 to over turn on its roof sliding back across the highway coming to an uncontrolled final rest in the center lane facing a easterly direction. No injuries were reported during this accident. Vehicle #1 was towed by Star towing due to damage. I-95 northbound in the area of exit 21 is a three lane limited access highway with shoulders on both sides of the roadway. There is a center median divider that separates the south and northbound travel lanes. The weather was clear and traffic flow light due to the time of morning. The roadway was dry and free of obstructions. Operator #1 (Sanchez) said she was traveling northbound on I-95 in the center lane. Operator #1 said she lost control and swerved towards the right shoulder of the roadway. Operator #1 said she struck the metal beam guard rail in the right shoulder and could not remember what happened after that. Prior to my arrival, vehicle #1 was at an uncontrolled rest in the center lane on it's roof facing in a easterly direction. I inspected vehicle #1 for damages caused by the accident heavy damage to the front end and drivers side front tire of vehicle #1 along with heavy crushing damage to the roof. Vehicle #1 had to be towed from the accident scene as a result of the damages. The damage sustained by vehicle #1 is consistent with striking a fixed object and rolling over. I inspected the roadway for physical evidence and located approximately 10 feet of furrow marks in the right shoulder leading to the guard rail. At the point of contact on the metal beam guard rail were fresh paint transfers from vehicle #1. 30 feet of the metal beam guard rail was damaged in the collision and DOT was notified. Based on operator statements and physical evidence, I determined operator #1 to be at fault for the accident and issued her an infraction for failure to maintain proper lane (14-236) in violation of the Connecticut General Statutes. Case Closed.

Connecticut DOT's ET-Plus vehicle crash experience at	
Route	I-95 NB
Milepost	25.76
Location Description	I-95 NB Exit 23 "Rte 1 Kings Hwy" off ramp left side
Roadway type	Off ramp with Asphalt Pavement surface
Date of Accident	5/15/2012
Crash Narratives	Yes
Crash Diagrams	Yes
Crash Severity	PDO
Vehicle mass	1998 Nissan
Vehicle speed	unknown
Angle of impact of the vehicle	Vehicle was traveling in the right lane. After driver experienced a sudden vehicle shake, lost control and traveled directly toward the exit ramp gore area hitting the guard rail coming to an uncontrolled final rest in contact with the guard rail with its rear end extended into off ramp (from diagram vehicle was perpendicular to impact attenuator) .
Orientation of vehicle at impact	front corner
Weather	10:12 pm Weather was clear, road surface wet from earlier rain fall and Traffic was light
Condition of shoulder/roadside	Unknown
Installation/Maintenance History	Originally installed in 2009 - Maintenance History unknown
Terminal Condition	Provided image from state's network collection effort dated June 27, 2011

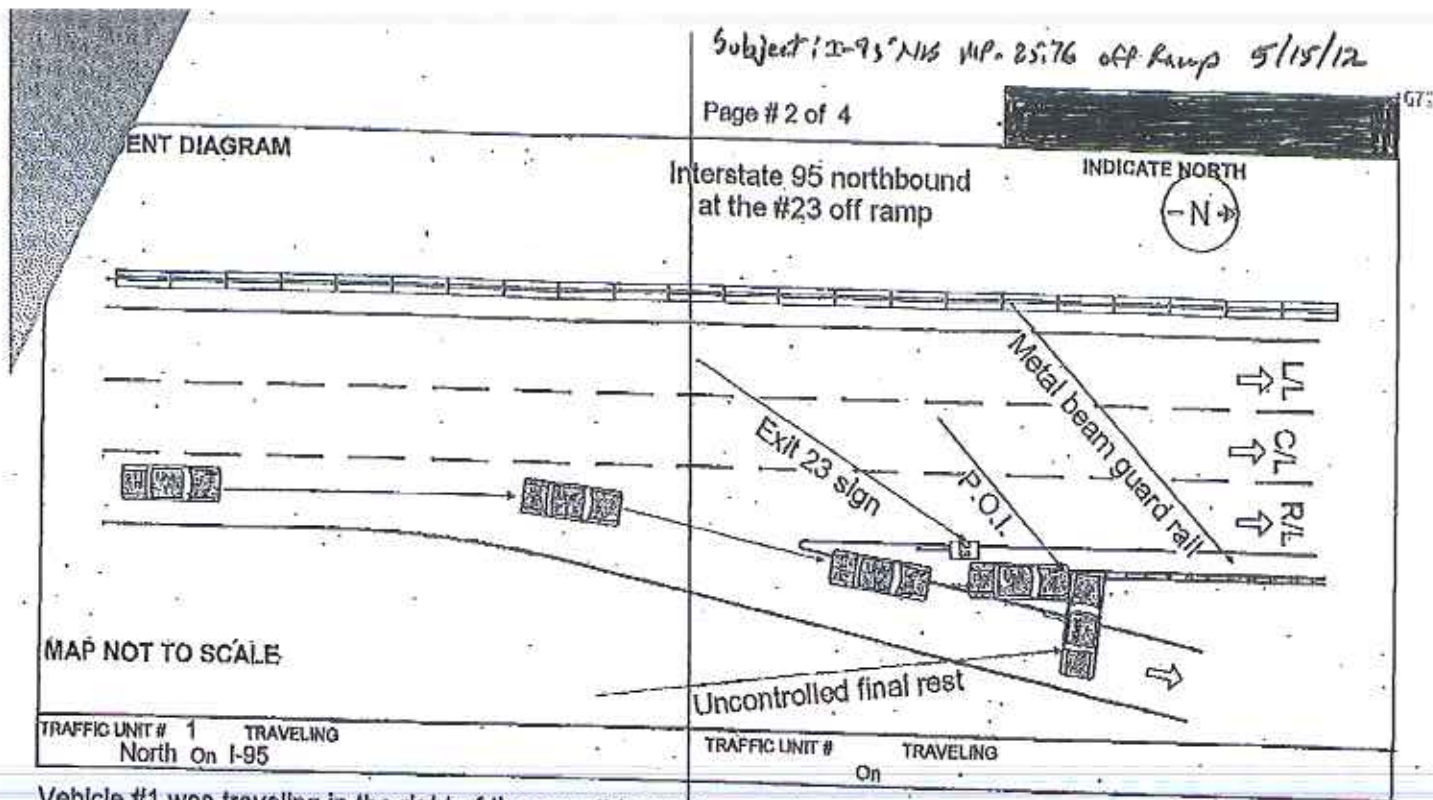


Connecticut -Route I-95 Northbound at Mile Post 24.26 – Photolog Picture of system taken prior to accident

Pictures at time of repair

No Pictures available of the system at the time of the repair

State Police Crash Diagram & Narrative



Vehicle #1 was traveling in the right of three northbound lanes when Operator #1 lost control of the vehicle. Vehicle #1 left the travel lanes and entered the #23 exit ramp gore area where it struck the metal beam guard rail.

Operator #1 stated his vehicle was traveling in the right lane at approximately 55 to 65 mph. Operator #1 stated he "wondered if something happened" to his wheels because he suddenly felt his vehicle begin to shake. He stated he lost control of the vehicle and it began traveling toward the #23 off ramp. Operator #1 stated his vehicle left the travel lane and entered the grass gore area of the #23 off ramp. He stated his vehicle struck the metal beam guard rail. Operator #1 stated he was uninjured.

Upon my arrival at the scene, I observed Interstate 95 is a six lane, divided, limited access highway with three lanes in each direction (north and south). The roadway was wet from earlier rain fall and traffic was light. The roadway also appeared clear of any significant debris or tire marks. Vehicle #1 was at an uncontrolled final rest in contact with the metal beam guard rail. Its rear end extended into the #23 off ramp. Vehicle #1 appeared to have minor front end damage. There was approximately 20 feet of guard rail damaged as a result of this accident. Based upon Operator #1's statements, I inspected Vehicle #1's tires for damage. All four of the vehicles tires appeared to be inflated with adequate tread. The vehicle was towed from the scene by IFT. During the process of towing getting the vehicle on the flatbed, there appeared to be no problems with the steering of the vehicle.

	Connecticut DOT's ET-Plus vehicle crash experience at
Route	Rte 184 WB
Milepost	9.16
Location Description	0.3 of a mile west of the Rte 184/Al Harvey Rd intersection
Roadway type	two lane rural collector
Date of Accident	Approximately 7/1/2014
Crash Narratives	No Accident report
Crash Diagrams	No Accident report
Crash Severity	Vehicle drove away - no accident report on file
Vehicle mass	unknown
Vehicle speed	unknown
Angle of impact of the vehicle	unknown
orientation of vehicle at impact	unknown
Weather	Damage discovered during Maintenance Foremen's roadway review
Condition of shoulder/roadside	unknown
Installation/Maintenance History	System installed in 2006 / Maintenance History - system replaced after 12/10/13 accident
Terminal Condition	Provided image from 2013 state's network collection effort dated June 12, 2013 and pictures of system at time of repair after the non-reported accident.



Connecticut -Route 184 Westbound at Mile Post 9.16 – Photolog Picture of system taken prior to accident

Pictures at time of repair





State Police Crash Diagram & Narrative

No Accident report filed.