Hampton Roads District

Top 6

Guardrail Hits Evaluations

Updated October 2018

Index

Introduction

- Site #1 Hwy. 58 East, East of Intersection of Snowden Road, Right Shoulder
- Site #2 I-64 East, MM 276, Granby St., Right Shoulder
- Site #3 I-264 East, Exit 13B to North Military Hwy., Left Shoulder
- Site #4 I-64 West toward VA Beach, Before Exit 292 to Rte. 17S, Left Shoulder
- Site #5 I-64 East toward Suffolk, MM 295.4 before Shell Road, Left Shoulder
- Site #6 I-64 East toward Suffolk, at Greenbrier Pkwy., Right Shoulder

Appendix A Safety Reviews

Introduction

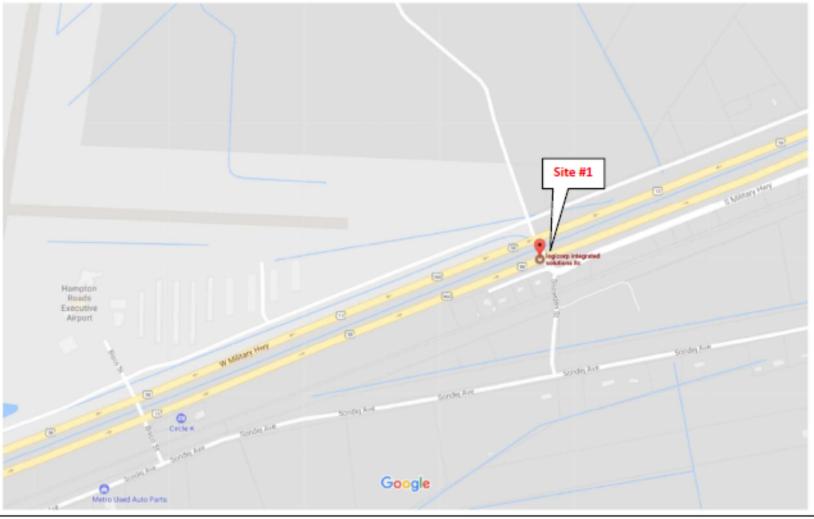
In the Spring of 2017, as part of VDOT's focus to improve guardrail safety, Central Office Traffic Engineering analyzed statewide crash data and developed lists of the most frequently hit guardrail terminals in the Commonwealth and each District. The District Traffic Engineers were asked to investigate the top sites in their jurisdictions and develop plans for site modifications which could reduce the frequency of guardrail terminal crashes.

Hampton Roads Traffic Engineering Evaluated the Top 6 sites in this district. Their findings and recommendations were issued in September 2017. Since then, the terminals at Sites #1 and 2 have been struck and rebuilt Sites #4 and 5 are part of the High Rise Bridge Design-Build project area, and are expected to be removed as part of that project in late 2018. Sites #3 and 6 will be modified as opportunities become available.

This report details the original recommendations for the Top 6 High Hits Guardrail Sites and efforts taken to improve the safety of each.

Hwy. 58 East, East of Intersection of Snowden Road, Right Shoulder

Location Map



Before Photo #1



After Photo #2 (First Repair terminal not moved back 12.5')



After Photo #3 (Latest Repair terminal not moved back 12.5')



Description/Field Assessment

- The previous guardrail run consist of a SKT-SP GR-9 Run-on End Terminal attached to Standard GR-2 W-Beam rail with a Rolled Buffered End Treatment. The previous overall length of the guardrail run was approx. 250' located at an offset of 12' from the edge of travel and 2' from the Edge of the paved shoulder.
- The guardrail is protecting an overhead sign structure that is located approx. 20' from the Edge of Travel to the back of the structure and approx. 215' from the center of the intersection of Snowden Road. The previous length of guardrail from the run-on end terminal to the sign structure is approx. 165'.
- The current calculated length of need is 144°.
- The existing cross slope of the shoulder is relatively flat approx. 6:1.
- The Current ADT is approx. 74,000 with 6% truck traffic.

Hits History

See Attach FR-300 report

Primary Issue

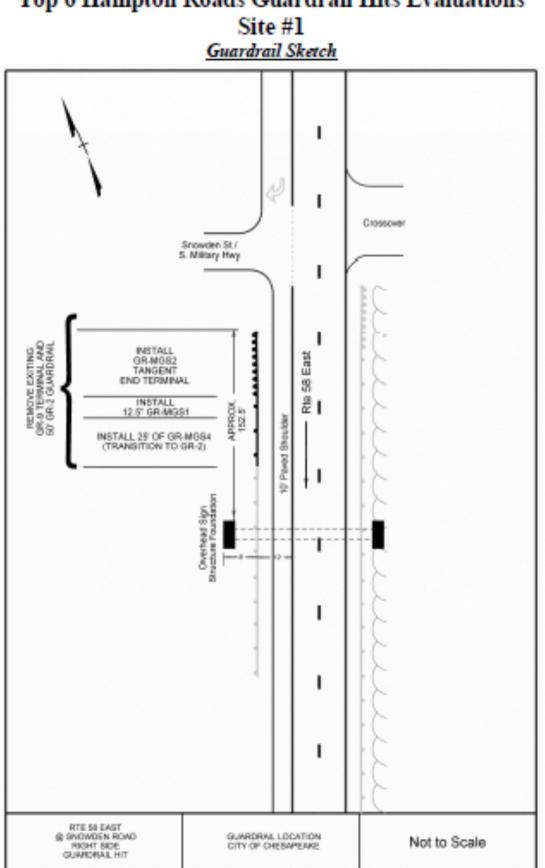
- Review of Crash Data and discussions with the HITS contract manager responsible for repairing this guardrail indicate that
 most of the damage incidents are the result of trucks making U-turns from South Military Highway onto EB Route 58.
 Secondary Issues
- Replacement efforts at this site were hampered by limitations of the HITS contract and the time to modify that contract to include MASH standards.
- Since the June 2017 investigation, this terminal has been replaced and struck three times. As shown in the photo above labeled "After Photo #2" the first repair the terminal was installed utilizing current MASH Standards but was not moved back 12.5' as recommended, also shown in "After Photo #3" the latest repair of the terminal was again not installed per recommendations and shortened 12.5'.

Top 6 Hampton Roads Guardrail Hits Evaluations Site #1 <u>Solution Photo</u>



Solution

As shown in the previous photo the Terminal was replaced in August of 2018 and moved back 12.5' as recommended in the
attached sketch, this has resolved the issue of truck traffic side swiping the terminal head.



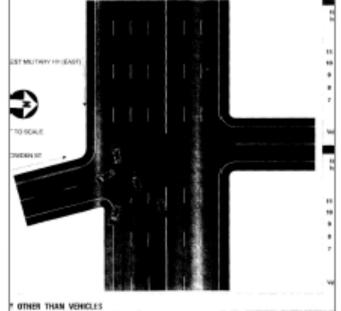
Top 6 Hampton Roads Guardrail Hits Evaluations

Crash Image

Crash Report

Document Number Revised Report	122090094			Jurisdiction County of Crash	City of Chesapeaks		GPS Lat. 36.778463	GPS Long. -78.438000
Crash Date City / Town of	Seturday Chesepeaks	06/30/2012 City	1808	Landmarka at Scene Railroad Crossing ID				
Location of Crash	WEST MILT	ARY HWY section With o	r 0.00 Not P	Provided Not Provided of		Mile Marker Number 0.00	Nut	nber of Vehicles 2





CRASH DIAGRAM

Fatalities	Non-Pedestrian	0

Fatalities Pedestrian 0

Injuries Non-Pedestrian 3

Injuries Pedestrian 0

Crash Description

Cresh Information

Location of First Harmful Event 1. On Roadway

Traffic Control Mechanical Device 1. Yes - Working

Roadway Surface Condition 1. Dry

Light Condition 2. Daylight

Treffic Control Type 4. Stop Sign

Roadway Alignment 1. Streight - Level

Roadway Surface Type 2. Blacktop, Asphalt, Bituminous

Roadway Description 2. Two-Way, Divided, Unprotected Median

VEH 1 FAILED TO STOP FOR THE STOP SIGN. VEH 1 PULLED INTO THE PATH OF VHE 21. VEH 2 STRUCK VEH 1.

Weather Condition 1. No Adverse Condition (Clear/Cloudy)

Roadway Defects 1. No Defects

Work Zone Related 2, No.

Work Zone Workers Present Not Provided

Work Zone Location Not Provided

School Zone 3, No Type of Collision 2, Angle

Work Zone Type Not Provided

Relation to Roadway 9. Within Intersection

Intersection Type 4. Four Approaches

Crash Report

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Driver Information 10/03/1982 Age 29

Vehicle Information 2

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Skidding Tire / Mark 2. After Application of Brakes

Document Number 122090094

Crash ID (3324935

Crash Report

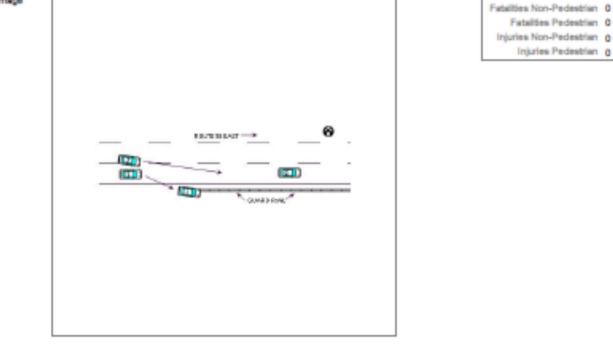
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		Yes							
	Position In / On Vahicle 4					Airbag I	Reployment Type 1	Deployed - Front	
	Position In / On Vehicle				1	Airbag I	Deployment Type 1 om Vehicle Type 1	. Deployed - Front . Not Ejected	
	Position In / On Vehicle				1	Airbag I	Deployment Type 1 om Vehicle Type 1	. Deployed - Front . Not Ejected	

Fatalities Pedestrian 0 Injuries Non-Pedestrian 0 Injuries Pedestrian 0

Crash Report

Document Number Revised Report	131965011 0			Jurisdiction County of Crash	City of Chesapeaks		GPS Let. 36.778509	GPS Long. -76.437830
Cresh Date City / Town of Location of Cresh	Sunday CHESAPEA ROUTE 58 I No - At Inter	EAST	150 20.00 Fer	Landmarka at Scene Railroad Crossing ID at East of SNOWDEN ST.		Mile Marker Number	Nut	ther of Vehicles

Cresh Image



Cresh Information

Location of First Harmful Event	2. Shoulder	Roadway Defects	1. No Defects
Weather Condition	1. No Adverse Condition (Clear/Cloudy)	Relation to Roadway	8. Non-Intersection
Light Condition	5. Darkness - Road Not Lighted	Intersection Type	1. Not at Intersection
Traffic Control Mechanical Device	1. Yes - Working	Work Zone Related	2. No
Treffic Control Type	6. Traffic Lanes Marked	Work Zone Workers Present	Not Provided
Roadway Alignment	1. Streight - Level	Work Zone Location	Not Provided
Roadway Surface Condition	1. Dry	Work Zone Type	Not Provided
Roadway Surface Type	2. Blacktop, Asphalt, Bituminous	School Zone	3. No
Roadway Description	3. Two-Way, Divided, Positive Median Barrie	r Type of Collision	9. Fixed Object - Off Road

Cresh Description

VEHICLE #1 SWERVED TO AVOID VEHICLE #2, RAN OFF ROAD RIGHT AND STRUCK GUARD RAIL.

Crash Report

Driver Information 03/21/1977	Age 36	Vehicle Information 1	
Driver's Action	31. Avoiding Other Vehicle	Vehicle Maneuver	9. Ren Off Roed - Right
of Driver Contributing to the Crash			
Driver Vision Obscured Type of Driver Distractions		Skidding Tire / Mark	4. No Visible Skid Mark/Tire Mark
	14. No Driver Distraction 1. Had Not Been Drinking	Vehicle Body Type	1. Passangar car
Method of Alcohol Determination		Vehicle Demage	6 Totaled
Drug Use		Vehicle Condition	
Driver's License		Spec. Function Mator Vehicle	
Commercial Driver's License	NotProvided	EMV in service	
Safety Equipment Used	3. Lap and Shoulder Belt	Truck Cover	Not Applicable
	1. Deployed - Front	Vehicle Disabled	
Ejected from Vehicle	1. Not Ejected	Commercial Motor Vehicle	No
Date of Death		Towed	Yes
Injury Type	6. No lajury (driver only)	Oversized	No Cargo Spill No
EMS Transport	No	Override	No Underride No
Summons Issued		Initial Impact Area	
		Direction of Travel	
			28. Ren Off Road
Speed Before	Maximum ALI	Passencers Ade Count	5. Guerd Rell
Crash Spe	Grade Graded	(8 8-17 18-21 ≥ 21	Not Provided
60	60 60		Not Provided 5. Guard Rail
Weight over 10,000 lbs Commercial Motor Vehicle Section Vehicle Configuration	Not Provided	Seats 9 or more No	Hazardous Materials Placard No
Cargo Body Type		License Class	
OVWR/OCWR Itezerdous Material	Not Provided	Commercial Endorsement	
Hazardous Material Placard		HM Class	
HM 4-Digit		HM Cargo Present	
HM Placard Name		10M Cargo Released	
Carrier Identification			
Commericial Motor Carrier Name			
US DOT# / State			
Commercial / Non-Commercial	Not Provided		
Passenger Information			
EMS Transport		Safety Equip Used	
Date of Death		Airbag Deployment Type	
Position In / On Vehicle		Ejected from Vehicle Type	
		Injury Type	

Driver Information

Age Driver Fled Scene Driver's Action 42. Improper or Unsafe Late Change of Driver Contributing to the Crash 9. Usknows Driver Vision Obscured Not Applicable

Vehicle Information 2

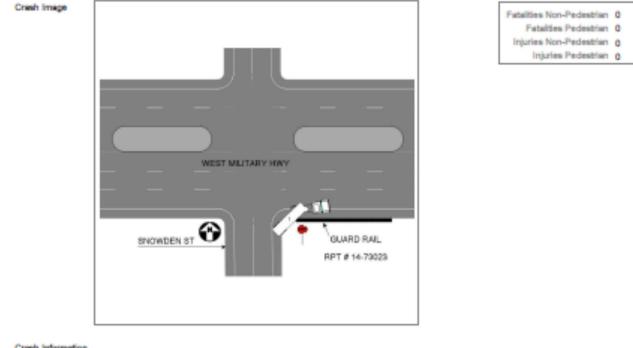
Vehicle Maneuver 14. Changing Lanes Skidding Tire / Mark 4. No Visible Skid Mark/Tire Mark

Crash Report

Typ	pe of Driver Distri	actions	Not Appli	cable					Martin Back Tone	1 Descent and		
			6. Usknov						Vehicle Body Type	1. Passenger cer		
Method o	of Alcohol Determ	inetion	Not Appli	cable					Vehicle Demage	2. No Demage		
	Dr	ug Use	3. Usknov	and and					Vehicle Condition	Not Applicable		
	Driver's L	icense					8	pec. Fun	ction Motor Vehicle	1. No Special Fund	tion	
Com	mercial Driver's L	icense	NotProvid	fed					EMV in service	Not Applicable		
	Safety Equipment	t Used	Not Provi	ded					Truck Cover	Not Applicable		
	1	Air Beg	Not Provi	ded					Vehicle Disabled	No		
	Ejected from \	Vehicle	Not Provi	ded				Comm	ercial Motor Vehicle	No		
	Date of	Death							Towed	No		
	Injur	y Type	6. No laja	ry (driver only)					Oversized	No	Cargo Spi	No
	Carlo To								Override	No	Underride	e No
			NotProvid						Initial Impact Area	Not Provided		
	Summons	sened	Not Provi	ded					Direction of Travel	East		
									Crash Events: 1.	41. Non-Collision L	Inknown	
	A								2	Not Provided		
	Speed Before Crash			Maximum Safe Speed				e Count	3.	Not Provided		
			ed Limit		< 8			> 21	4.	Not Provided		
	60		60	80	0	0	0	0	Most Hermful	41. Non-Collision L	Inknown	
	Weight over 10,00 al Motor Vehicle S Vehicle Config Carpo Bod	ection purstion	No Not Provi			Seats	9 or mo	n No	Lionne Class	Hazardous Materials	Placard }	No
			Not Provi					Co	mercial Endorsement	t		
Hazardous												
H	lazardous Material	Placard							HM Class			
	HM	4-Digit							HM Cargo Present			
	HM Placan	d Name							HM Cargo Released			
Carrier Ide	ntification											
Comme	ricial Motor Carrie	r Name										
	USDOT	/ State										
Com	mercial / Non-Com	mercial	Not Provi	ded								
Passenger 1	Information											
	EMS Tra	aport						5	afety Equip Used			
	Date of	Death						Airbag I	Seployment Type			
	Position In / On Ve	shicle						-	om Vehicle Type			
									Injury Type			

Crash Report

Document Number Revised Report	143125209 1			Jurisdiction County of Crash	City of Chesapeaks		GPS Lat. 38.778480	GPS Long. -78.437740
Crash Date	Friday	11/07/2014	1747	Landmarks at Scene				
City / Town of	Chesapeake			Railroad Crossing ID				
Location of Crash	WEST MILT	ARY HWY				Mile Marker Number	Nur	nber of Vehicles
								1



Cresh Informet	

Location of First Hermful Event 4. Roadside

Weather Condition	1. No Adverse Condition (Clear/Cloudy)	Relation to Roadway	9. Within Intersection
Light Condition	5. Darkness - Road Not Lighted	Intersection Type	2. Two Approaches
Traffic Control Mechanical Device	1. Yes - Working	Work Zone Related	2. No
Traffic Control Type	4. Stop Sign	Work Zone Workers Present	Not Provided
Roadway Alignment	1. Streight - Level	Work Zone Location	Not Provided
Roadway Surface Condition	1. Dry	Work Zone Type	Not Provided
Roadway Surface Type	2. Blacktop, Asphalt, Bituminous	School Zone	3. No
Roadway Description	3. Two-Way, Divided, Positive Median Barrier	Type of Collision	9. Fixed Object - Off Road

Cresh Description

VEHICLE #1 (TRACTOR TRAILER) WAS ATTEMPTING A RIGHT TURN ONTO WEST MILITARY HWY (RT-58) EAST BOUND FROM SNOWDEN ST. AS THE VEHICLE WAS TURNING THE TRAILER TRAVELED OFF THE ROADWAY TO THE RIGHT AND STRUCK THE GUARD RAIL.

TRAILER : 2014 HYUNDAI 53FT CARGO TRAILER, INDIANA LICENSE # P376073 , VIN# 3H3V532CXET052969

Roadway Defects 1. No Defects

Commonwealth of Virginia - Department of Transportation - Traffic Engineering Division 06/07/2017 10:02:26AM

Crash Report

Driver Informatio	03/29/1967	Age 47	Vehicle Information 1	
	Driver's Action	17. Other Improper Turn	Vehicle Maneuver	2. Making Right Turn
	ting to the Crash			
	Vision Obscured		Skidding Tire / Mark	Not Applicable
Type of D		14. No Driver Distraction	Vehicle Body Type	25. Truck - Truck Tractor (Bobtall-No Traile
		I. Had Not Been Drinking		
Method of Alcoh	hol Determination		Vehicle Damage	
	Drug Use		Vehicle Condition	
	Driver's License		Spec. Function Motor Vehicle	
	Driver's License		EMV in service	
CHERTY	Equipment Used	3. Lap and Shoulder Belt		Not Applicable
E.M.	All Dag	2. Not Deployed	Vehicle Disabled Commercial Motor Vehicle	
c.jec	cted from Vehicle Date of Death		Towed	
		6. No lajury (driver only)	Oversized	
	underly of the	o. no silery (enverony)	Override	
	EMS Transport	No		4. Right side - rear
1	Summons Issued	2. No	Direction of Travel	-
			Crash Events: 1.	
				Not Provided
	ed Before		ALL Passencers Age Count	Not Provided
(Crash Spe	ed Limit Safe Speed	< 8 8-17 18-21 ≥ 21	Not Provided
		60 60	0 0 0 0 Most Hermful	
Weight	over 10,000 lbs	No	Seats 9 or more No	Hazardous Materials Placard No
Commercial Motor	Vehicle Section			
	ticle Configuration	Net Provided		
	Cargo Body Type		License Class	
	OVWR/OCWR		Commercial Endorsement	
Hazardous Materia				
	s Material Placard		HM Class	
	HM 4-Digit		HM Cargo Present	
	HM Placard Name		10M Cargo Released	
Carrier Identificati	on			
Commericial M	fotor Carrier Name			
	US DOT# / State			
Commercial	/ Non-Commercial	Not Provided		
Passenger Informa	tion			
	EMS Transport		Safety Equip Used	
	Part of Parts		Alder Deducer Trees	

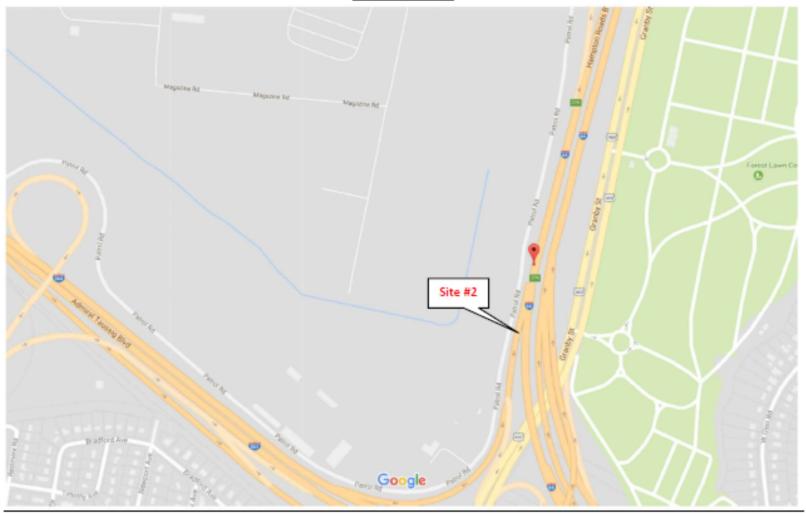
Date of Death Position In / On Vehicle

Airbag Deployment Type Ejected from Vehicle Type Injury Type

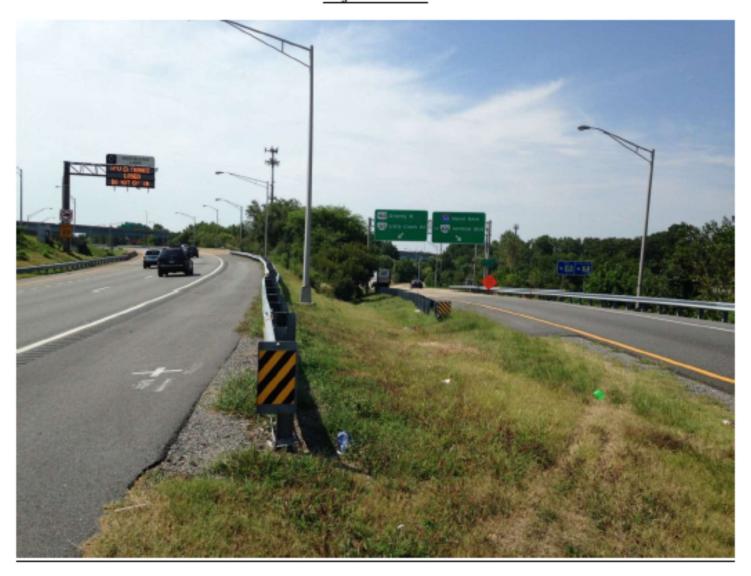
Site #2

I-64 East, MM 276, Granby St., Right Shoulder

Location Map



Top 6 Hampton Roads Guardrail Hits Evaluations Site #2 <u>Before Photo</u>



Top 6 Hampton Roads Guardrail Hits Evaluations Site #2 <u>After Photo</u>



Description/Field Assessment

The previous guardrail run consisted of a X-Lite GR-9 Run-on End Terminal (No Longer Approved for use) attached to Standard MB-3 rail with a FOA End Treatment attached to the Overpass bridge over Granby St.. The previous overall length of the Guardrail run is Approx. 340' located at an offset of 12' from the edge of travel. The guardrail is protecting motorist from a steep gore embankment that varies from a 4:1 to 2:1 front slope, the breaking point of the slope is approx. 18' from the edge of travel and the distance from the existing run-on end of the guardrail terminal to the non-recoverable slope break is 150'.

- The calculated length of need required for the non-recoverable embankment is 120'.
- The Combined Mainline ADT is approx. 91,000 with 2% truck traffic.
- The Ramp ADT is approx. 14,000.

Hits History

See Attach FR-300 Report

Primary Issue

 It appears that most of the guardrail hits are due to drivers changing lanes too late in the right exit only lane to avoid taking the Granby St./I-564 Exit.

Suggested Recommendations/Ideas

- Shorten Guardrail by 25'
- Tie the Existing Guardrail in with the guardrail from the Ramp meeting in the low point or middle of the Gore and terminate with an impact attenuator. (It has since been determine that the grade differential between the ramp and mainline guardrail is too great for this option.)
- Extend Rumble Strips into the Gore area
- Check and replace missing Raised Pavement Markers

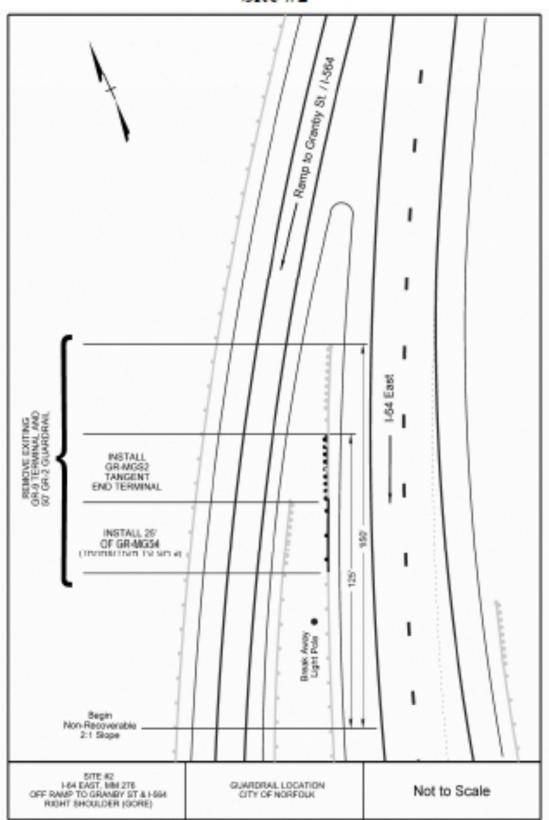
· Check locations of exit signs for proper advanced warning of the exit, relocate or add signs if needed

Possible Solution

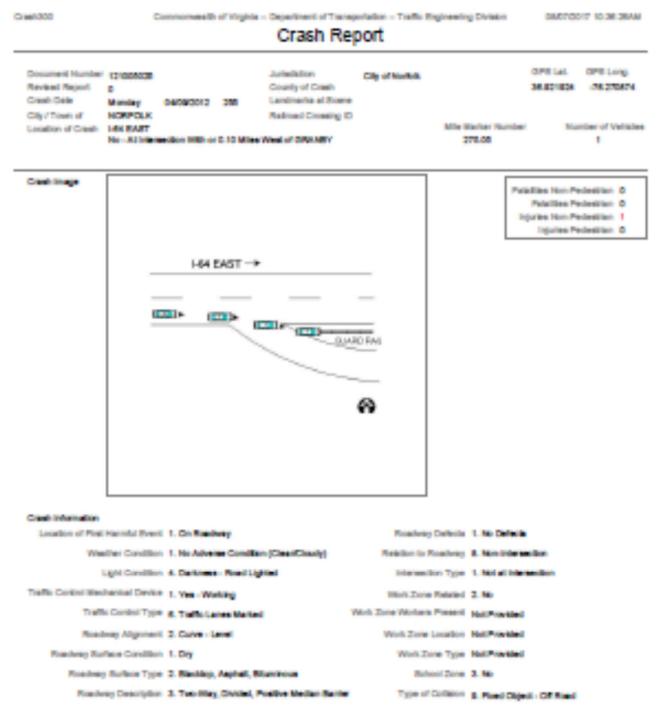
Shorten Guardrail by 25' and replace exiting GR-9 with New MASH Standard End Terminal (GR-MGS-2). This would still
maintain the length of need required for the non-recoverable slope break.

Final Solution

- Traffic Engineering requested a rumble strip installation task order for this site and Sites 4 and 5. Installation and Maintenance
 reported that these sites did not include a sufficient length of rumble strip to meet the minimum length required to initiate a
 task order under the FY17 pavement marking on-call contract.
- This site was hit in early March 2018. (The Task Order was received by the HITS Coordinators on March 5.) The ACE for the HITS program directed the contractor to shorten the guardrail and install the new terminal at the location indicated in the Site Sketch as recommended by Traffic Engineering. The repair has been completed as per the attached sketch, (see photo).



Top 6 Hampton Roads Guardrail Hits Evaluations Site #2



Crash Description

VEH. 1 RAN OFF ROAD RIGHT AND BTUCK BUARD RAL.

Page 1 of 2

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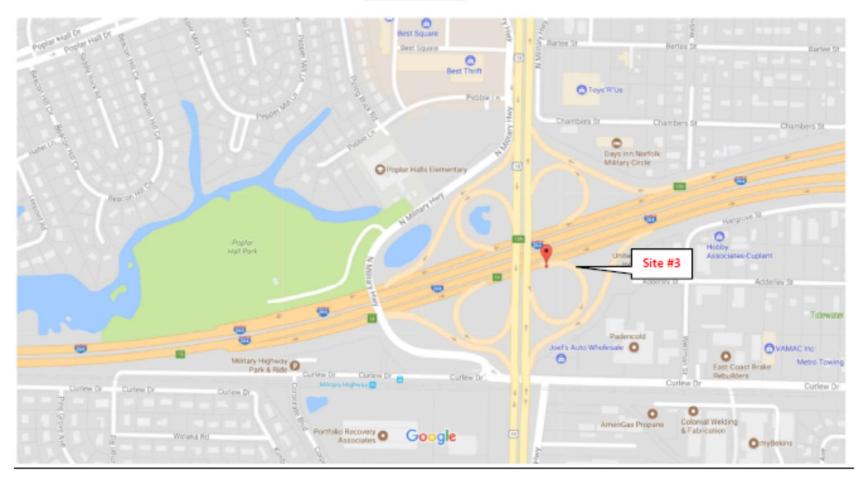
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Crash ID/3103388

Top 6 Hampton Roads Guardrail Hits Evaluations Site #3 <u>I-264 East, Exit 13B to North Military Hwy., Left Shoulder</u>

Location Map





Top 6 Hampton Roads Guardrail Hits Evaluations Site #3



Description/Field Assessment

- The existing guardrail run consist of a SKT-SP GR-9 Run-on End Terminal attached to Standard GR-2 W-Beam rail extending
 up the ramp with a rolled buffered end treatment with no apparent anchor point at the end of the ramp. The existing overall
 length of the Guardrail run is Approx. 640' located at an offset of 5' from the edge of travel. The guardrail is protecting a
 steep embankment approx. 3:1 2:1 front slope leading to a drainage pond with a breaking point approx. 8' from the Edge of
 Travel. The drainage pond is approx. 33' from the beginning of the Gore area and approx. 40' from the mainline Edge of
 travel (outside of the 30'-34' clear-zone).
- The Current Ramp ADT is approx. 6,100.

<u>Hits History</u>

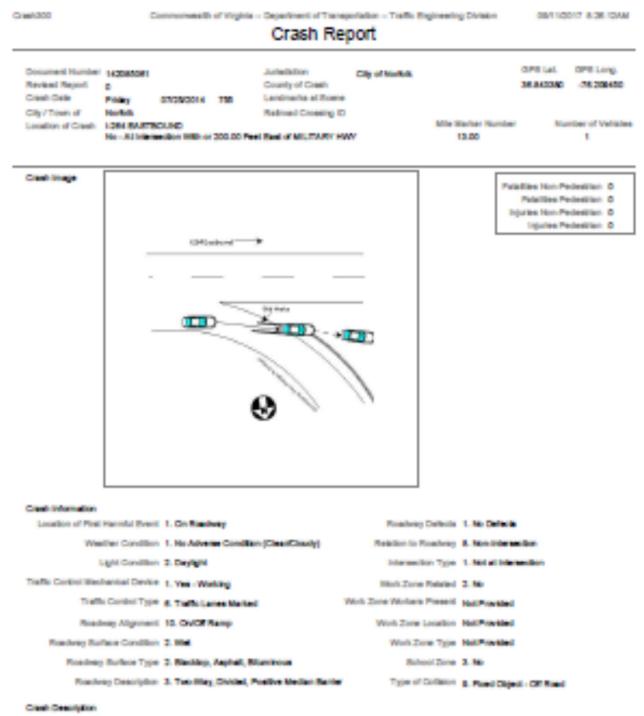
- See Attach FR-300 Report
- This site has not been hit since he initial report.

Primary Issue

· It appears that most of the guardrail hits are due to drivers exiting to late onto the ramp at excessive speed.

Suggested Recommendations/Ideas

- Possibly additional advanced warning signing for the exit ramp, although signing appears adequate.
- Add reflectorized delineators/object markers or Chevrons in the Gore.
- Replace Headwall with a Drop Inlet and regrade the left shoulder to eliminate the drop off hazard.
- Add advisory speed plaque to the exit sign.



VEH #1 5AN OFF THE LEFT BOD OF THE OFFEARER HITTHD THE GLARDRAIL AND CARE TO A REAT IN THE GRASS.

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Page 1 of 2

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Crash Report

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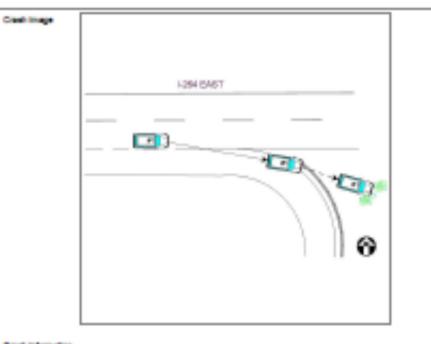
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Readway Alignment 1. Straight-Level Work Zone Location NatiProvided Readway Surface Condition 1. Day Work Zone Type NatiProvided Readway Surface Type 2. Similary, Applied, Stamirous School Zone 3. No										
Roschway Barlace Condition 1. Day Work Zone Type NatiProvided Roschway Barlace Type 2. Blanking, Apphali, Blancincus Barbool Zone 3. No	Tiell	la Carillel Typ	* 6.THENLA	ines Marker	4	Work Zone Work	ara Pisseiti	No.Provide		
Roadway Surface Type 2. Blacklap, Apphall, Blammous School Zone 3. No	Read	loay Alignma	< 1.8bm/d.	Level		Work Za	me Location	No.Provide		

Cresh Description

VEH #1 MAN OFF BOAD TO THE RIGHT STRUCK THE GUARD BALLAND OVERTURN

Granh000 Commonwealth of Virginia - Department of Transportation - Traffic Regimenting Division 08/11/2017 8-38 12AM

Crash Report

Criver Informe	ille consume	Age 36					Ande 14A	emation 1			
	Driver's Action	40. Pell to Mak	sinin Prope	Called				Martin Barrense	5 Rep Of Read-		
	Hully to the Cash										
	ver Valon Olacurel							Bolding Tile / Mark	4. No Visibe Baal	Marketing	Mark
Type	d Driver Diskeulikins							Vehicle Body Type	22. Trust - Sport V	and your	Alle (BLIV)
Martine of the	Extention Determination	3. Detailing - 8	send make					Vehicle Camage	a colori		
	Drug Use							Vehicle Candidon			
	Diver's Liverse						inter Part	citon Motor Vehicle			
Commen	stal Driver's Literate	Not Breakled						ENV is service			
	by Respond Land		the last					Trust Cover			
		8. Deployed - C						Vehicle Disabled	Yes		
	Secled from Vehicle	1. Not Fjordel					Comme	ercial Motor Vehicle	16x		
	Date of Death							Towed	Yes		
	Injury Type	6. No leave Of	the style					Oversided	His	Cargo	Split No.
	FMS Tanaport	No						Overlide	Ma	Under	ritie No
	Summore (second							Indial Impact Area			
								Disection of Travel			
_									38. Ran Of Read		
	Load Ballins	M	and the second	ALL PA		en Ap	Court		5. Guard Rall		
	Clash Siles	ed Lands Ref	le Rymeil				i+ 21		30. Oreniam (Roll		
	88	10	88		0				Had Provided		
								More Parental	5. Oueri Rell		
104	ghi ever 16,000 Da	No			Seats 1	l ee me	m He		Pasarileus Maierial	Parent	He
Commental Ma	nier Valida Bartien										
1	Value Configuration	Not Perciled									
	Cargo Body Type	Not Penddad						Linese Class			
	OVERGOES	Not Peridal					Ce	on avial Tailonan av			
Name International Materia	and all										
Hame	rime Material Recert							HM Class			
	Hite & Digits							HM Cargo Present			
	HM Passed Name							EM Cargo Robused			
Carle Bella											
Commanded a	4 Motor Carrier Name US DOTS / Name										
-	tal./ New Cremental										
	and the second second	No. Persolati									
Parameter Infor	and an and an										
	EMS Transport							ality Repip Lines			
	Date of Death							Imployment Type			
Peer	tion In / On Valida							on Value Type			
								lajory Type			

Commonwealth of Virginia - Department of Transportation - Traffic Engineering Division 00/11/2017 8-28 (DAM

Crash Report

Document Number Revised Report Crash Date City / Town of Location of Crash	t Runday Northit RR 1284	carityzota webben Willh er		Juriediction County of Creath Landmarka at Scen Radioard Crossing 1 Real of WEUTARY Her	D		arhar Number 2.80	0.P8 Lat. 38.843310	CPE Log. -76 208130 Iber of Vehicles 1
Cashingt		3	E81-264 810N	SHOULDER MUTINGY HIMY ENT				parties Main.Pe	destrian O
Crash Internation Location of Post	No. of Lot				P. etc.				
				in (CasiCharly)			1. No Defect		
		. 4. Dallance			bio an	Bon Type	1. Not all the	and in the	
Traffic Control Max	herital Devis	· Live-We	1.00		West Zon	e Tataled	2.50		
Tieff	le Control Typ	* 6. THINGS	tes Marke		Web Zine Weber	a Present	No.Provided		
Read	loay Alignman	il 3. Cuive - Li			Work Zone	Location	NotProvided		
	face Conditio						Not Provided		
		 2. Backlep, 3. Two Hieg 		Manifolia Positive Median Sante		Collision	3. No 8. Pixel Clip	d OF Red	

Crash Description

VEHICLE #1 RAN OFF ROAD TO THE LEFT STRUCK OLIVROPAL AND A BION POST.

Document Number 100780027

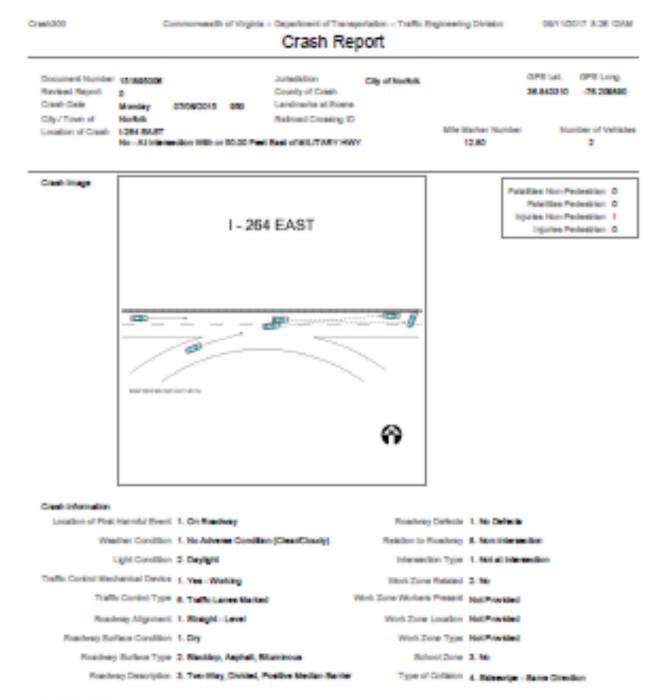
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C mt/300

Crash Report

Oriver Information of Children	Age pa	Vehicle Information 1	
Critren's Autom	40. Put to Maintain Proper Costor		10. Res Of Read-Left
of Driver Contributing to the Crash	1. No Defects	VERUE DE DUTE	S. No. Of Head Long
Driver Valor: Olaroured	1. Net Obamond	Robbing The / Mark	4. No Walke Skil Mark/The Mark.
Type of Driver Diskesilisme	A - C - C - C - C - C - C - C - C - C -	Vehicle Body Type	1. Personal car
	1. Deinking - Obviously Dreak		-
Method of Alcohol Determination		Vehile Camage	
Chug Use	1.8e	Vetode Candition	
Driver's Literae		Rpm: Punction Motor Vehicle	
Commential Difver's Literate		Early in service	
Bafely Bigugeneril Used		Titalk Caver	
	1. Net Deployed	Vehicle Disabled	
Ejected from Vehicle Date of Death		Commercial Motor Vehicle Towed	
		Overside	
to Bard (Mar	6. No legary (deture only)	Overlide	
BMS Transport		Initial Impant Area	
Summone Issued	1. Yes	Direction of Travel	
			3. Ret Of Red
			5. Quarti Rall
River Before Clash	Rocks Research	seeingers Age Court 3	8. Spr. Traffic Spreil
- Apres	NU CARA	8.17 1821 221	had Provided
50	M 30 0		5. Quarti Rali
Weight over 10,000 Dat	Ka	Same Freemann Na	Neurrisse Materiale Placemi Ne
Concerned Motor Valida Sartice			
Valuate Configuration	Not Persided		
Cargo Body Type	Not Persided	Manager Class	
OVERGOES	Not Peridal	Cremental Techniques	
Namelina Material			
Reservices Material Record		Hid Class	
Hit & Dight		Hhi Cargo Present	
KM Parent Name		HM Cargo Rainwald	
Carrier Bentilention			
Connected Motor Carrier Name			
US DOTH / Bists			
Cremerial / New Cremerial	Not Percided		
Passage Information			
EMS Transport		Ballety Repip Usual	
Date of Death		Airbag Deployment Type	
Position In J Co. Voltida		Special from Valuate Type	
Contraction of the second		distant new restory (15s	

Index Chine



Crash Description

VEHICLE #1 ETRUCK VEHICLE #2 ON THE RIGHT BDE CAUSING VEHICLE #2 TO STRIKE JERSEY WALL.

Document Number 151805008

Page 1 of 3

C mil.200

Crash Report

one memolie origines	Age 31	Vehicle Information 1	
Diferents Autom	42 Japanpar or Usually La	a Charge	
Driver Contributing to the Casel-		Versue Maren	or 6 Marging Into Tartis Lane
Driver Valor-Olacored	1. Set Channel	Blobbing Time / M	 A. No Walks Skill Mark/The Mark.
Type of Driver Diskesilisme	14. No Driver Distruction	Value Body To	pa 1. Passenger sar
	1. Red Not Sam Drinking		
Relicol of Alachol Delemination	Not Applicable		ger 1. Undersonen
Chug Use	3. No		on 1 No Defects
Difver/a Citizense		Rpes. Punction Motor Veto	the field Applicable
Commencial Driver's Litense		Early in serv	ter Hed Applicable
Ballely Boupment Used	3. Lap and Shouldar Balt	Trusik Car	W Hel Applicable
At Bag	1. Net Deployed	Vehicle Deals	
Figurated from Vehicle	1. Not Fjoriad	Commercial Motor Veto	the Ner
Date of Death-			ed No.
Indust Adda	6. No legacy (detune only)		ed No Cargo Spill No
EMS Tanapoli	Ma		ide No Underritte No
Burnning Issued			tes TL Left state - front contest
		Direction of Tra	
		Crash Events	1. 20. Motor Vehicle In Transport
Read Balance	Maximum	ALL Passengers Age Court	 Had Provided
(There are	talk Sale Speed	48 BIT 1821 - 21	3. Had Provided
	M 80		 Not Provided
_		Most Harr	ful 35. Molor Velacie In Transport
immental Motor Valida Bartion Valida Configuration			
Cargo Budy Type	Not Provided	Manage C	
OVER-DOM:	Not Percided	Communial Relevan	and the second se
anantima Material			
Reservices Material Record		HIM C	-
Hist & Dight		Hid Cargo Pro	and the second se
RM Parent Name		EM Cargo Balan	
aris Battletin			
Connected Motor Carrier Name			
US DOTH / Bala			
Conserval / New Commercial	Not Provided		
and a second second			
EMS Transport		Balley Topip Used	
Date of Death		Airling Deployment Type	
Position In / On Valuate		Rented from Valuate Type	
		lighty Type	

Driver's Autor: 1. No lapping & Asian of Driver Contributing to the Casel: 1. No Default Driver Value Obsoured 1. No Observed

Vehicle Maneurer 1, Georg Strength Alread

Stocking Tim / Mark 3. Sefare and After Application of Statutes

Clash Drussery

Page 2 of 3

Crash200

Crash Report

Ty	pe of Driver Dialo	cline 14.8e1	Driver Distantion					Vetade Body Type	1. Bernstein der		
	0	thing 1 Bad	to Base Debiling					cannot prod . The			
Method :	of Revinel Deleves	nation Not Apr	al deside					Vehille Camage	1. Uniterent		
		Unit 2.No						Vehicle Condition	1. No Defecta		
	Dilver's L	line inter				8	Here Press	obos Motor Vehicle	Hel Applicable		
Care	mential Driver's L	inter No.						ENV is service	Hel Applicable		
	Bably Boupment	Used 3 Laps	nd Klambler Balt					Trust Cover	Hel Applicable		
	1	UrBag 1. Depk	ry al. Prost					Vehicle Disabled	Yes		
	Ripsiled from V	which 1. No. 1	(antal)				Comme	erated Motor Vehicle	16x		
	Calle of	Death						Toward	Yes		
	Index	Type 3. Mine	Peaklin Injury					Oversided	16	Cargo By	10 Mar
	-							Overlide	16.	Under 6	in the
		report Tes						Initial Imped Area	3. Right side - mail		
	Party and	sound 3.Ne						Direction of Travel			
									20. Molec Vehicle In	Tenend	i
								-	11. James Web		
	Rosed Ballers Creats		Maximum Rate Ryseci				Count		Hed Provided		
		Rpeed Land			8.17			4.	Not Provided		
	* 0	50	88	•	¢	0	0	Most Parental	11. James Web		
Reading	Cargo Bod Christian Material Teacritica Material	nten miles Xat Per 5720 Xat Per 2793 Xat Per 2793 Xat Per 7anel 60g0	take.		Seate (10.000		Linnas Can mid Tolenas a KM Can KM Can Patent KM Can Island		Read	N=
Owning Re-	and some							the case cases			
	entelled Minister Carefue	No.									
1.000 854	US DOTE										
-	marriel / New Core										
1.000	and the second										
Parage	EMS Ten EMS Ten Date of 1 Position In J On We	Dealth					Althoug 1	ahiy Tapay Lland Inglaynani Taya na Yahiola Taya Inglay Taya			

Creek200

Crash Report







Paladian Non-Pedestrian D Pelalities Pedestrian D

- Injuries Non-Pedestrian 1 Tigutes Pedestrian D

Cresh Internation

Location of Pirel Hacmild Event	1. Ch Randway	Roadway Defects	1. No Defects
Weiter Condition	1. No Advente Condition (Clear/Cloudy)	Relation in Roadway	8. Non intersection
Light Condition	4. Darkings - Read Lighted	Intersection Type	1. Not all intersection
Traffic Control Mechanical Device	1. Yes - Webling	Work Zone Retailed	2.56
Traffic Context Type	6. Traffic Lanes Marked	Work Zone Workers Present	No.CProvided
Roadway Alignment	10. OVOF Ramp	Work Zone Location	No.CProvided
Readway Bullace Condition	1. Day	Work Zone Type	Hol/Provided
Roadway Burlace Type	2. Backlep, Asphall, Blammour	Bahool Zane	3.50
Readerary Description	3. Two Hier, Divided, Positive Median Sante	Type of Collabora	8. Fired Olgosi - Of Reed

Crash Description

VEHICLE BAN OFF ROAD LEFT, STRUCK THE GLARDRAL AND TERNINAL AND BON AND RAN INTO THE DITCH.

Crash000 Commonwealth of Vogisla - Department of Transportation - Traffic Regimening Division 08/11/2017 8-28 12/44

Crash Report

Driver Informatio											
	OVIDTHET	Age 18				1000	de 146	mation 1			
	Drive's Autor	40. The lar Ma	interio Press	· Costrol							
Driver Contrill	Alling to the Classic							Vehicle Managers/	E. Rat Of Rea	6 Left	
	Valor Discard		a l					Solding The / Mark	2 Aller Applicab	in of Bala	
Type of	Oriver Diskesilisme	1 Drive Puty	gran (
	Cristing	3. Detailing	Ability loops	limit.				Vehicle Body Type	C. Passenger ca		
Method of Alex	ind Determination	1. French						Vehille Carriege	6 Totaled		
	Chug Use	1.8e						Vehicle Condition			
	DiversiLitence					Ripe.	s. Pan	otion Motor Vehicle		nuillon .	
	al Difren's Litense								Hol Applicable		
Dates	p Bquigment Used								Not Applicable		
		1. Deployed						Vehicle Disabled			
19	ested from Vehicle		4			6	10000	erolal Molor Vehicle			
	Date of Death							Towed			
	salina jake	4. No Appare	a stat					Oversided			NUE No
	EMS Tanaport	He						Initial Impact Area		10000	
	Summore leaved	1. Yes						Direction of Travel			
									28. Ray Of Real		
									11 James Web		
200	Ciash Balance		deciman de Roseil						8. Stor. Traffic St	lane l	
	- Aller	and the state				18.21			H. Dian		
	48	50	30		¢		0	Most Name M	H. Dian		
Connected Mon	ii eene 10,000 Daa ee Valiida Backen				Seale 1		Ne		Hamarikaa Mainti	is Parent	Ne
50	thick Configuration										
	Cargo Body Type							Manage Class			
	OVERGOES	Not Percided					Ce	on avial Todowan at			
farming Maler	-										
10000-10	na Material Recard HM & Digit							HM Case Present			
	EM Parent Name							HM Cargo Released			
Carlo Resident								the case of the second			
	Motor Carrier Name										
	US DOTH / Bists										
Commercial	1 Non Commercial	Not Period									
wange laber								ality Reply Canil			
wanger lafers	EMI Transport										
	EMI Transport Date of Deeth							Imployment Type			
Pasangar Jahon	EMI Transport						idag D				

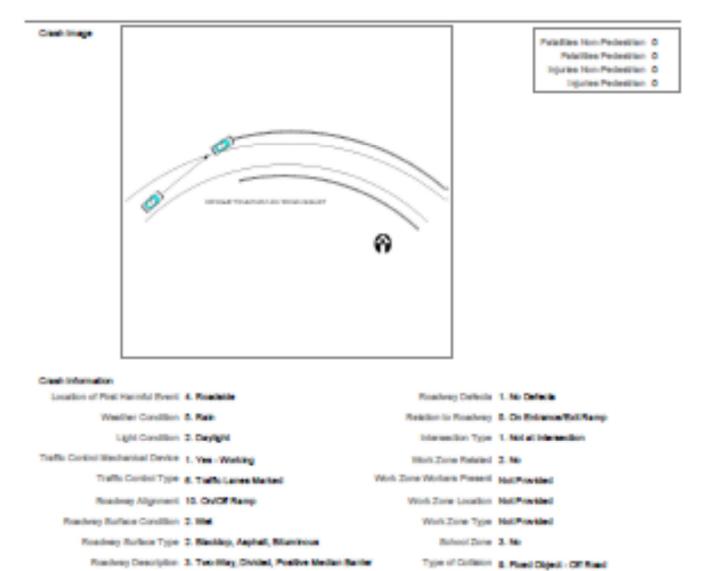
Creek Dy 4340487 Page 3 of 3

Commonwealth of Virginia - Department of Transportation - Traffic Engineering Division

08/11/2017 8 28 IDAM

Crash Report

Document Number Revised Report				Jurisdiction County of Creats	City of Number		OPE Lai. 36.843300	078 Long. -78 208 140
Crash Date	Thursday	100VO015	8.0	Landmarka al Rome				
City / Town of	Northilk			Relined Crossing ID				
Location of Crash				ed Baal of MILITARY HW	v	Mile Warker Number 13.00	Mut	t terration



Crash Description

C m1300

VEHICLE CHE NAN OFF ROAD AND ETRUCK GUARD BALL

Crash300 Commonwealth of Virginia - Department of Transportation - Traffic Engineering Division 08/11/2017 8-38 IDAM

Crash Report

Oriver Information (CVOW1884)	Age 31	W which a little	mation (
Driver's Addan	40. Fell to Maintain Proper	Creational		
of Driver Contributing to the Crash			Versule Maneurer	10. Ran Of Read - Left
Driver Valor Obsoured	1. Not Channel		olding The / Mark	4. No Visible Skil Mark/The Mark
Type of Driver Distautions	14. No Driver Distriction		And a state of the	1 Bernard and
Cristing	1. Bud Not Barn Drinking		Vehicle Body Type	C Passenger La
Method of Alashol Determination	Not Applicable		Vehicle Camage	8. OBer
Chug Use	1.8e			6. Wom or Stat. The
Difes/s Litense		Epec. Punc	Bon Moler Vehicle	1. No Rendal Punction
Commercial Driver's Livense				Hed Applicable
Balely Equipment Used	3. Lap and Shouldar Balt			Hed Applicable
	1 Not Deployed		Vehicle Disabled	
Rjesled from Vehicle	1. Not Fjorted	Contrainer	rolal Molor Vehicle	
Date of Death			Towers	
index A Advantage	6. No lejory (deture only)		Oversided	
EMS Transport	Ne			
Summone leaved	1. No.		Initial Impact Area Direction of Travel	
				28. Rei Of Rigel
				S. Nam Of Hoard 5. Quard Ref.
River Reform		ALL Passengers Age Court.		had Provided
Ciesh Bje	ed Land Rate Speed	K8 8-17 1821 > 21		had Provided
-	M 20			5. Quart Rall
They be ever 10,000 Day	8.	Sasial concess. Ma		Neurrine Material Passed Ne
Commented Marine Valida Raction				
Vehicle Configuration	Not Persided			
Cargo Body Type			Manage Class	
OVERAGES		Cen	married Technology	
Secondaria Material				
Namelica Material Namel			HM Case	
HML & Dight			HM Cargo Present	
EM Planet Name			KM Cargo Roleand	
arte Bettfreite				
Connected Motor Carrier Name				
US DOTH / Bale				
Connertal / Non Connertal	Not Provided			
ways blocking				
EMI Transport		14	inty Reption Lineal	
Date of Dash			ployment Type	
Position in / On Valuate			n Tablela Type	
Contraction of the second			Intern Type	
			and the second	

Clash Dructoon

Connormeelb of Vogisia - Department of Transportation - Traffic Regimening Division 08/110017 8:08 IDAM

Crash Report

Document Number Revised Report Crash Date		1109/2018		Juriedation County of Creek Landmerke at Rome	City of Nurlivia		075 Lal. 36.843380	078 Log.
City/Town of Locate	Northda			Relived Crossing ID		Mile Market Number	No	itter of Vehicles
	No-Albien	with a bill of the	0.10 Mile	Basi of MUTATY HWY		13.00		1



Location of Piral Harmful Event	2	Should be	Roadway Defects	1. No Defecte
Weller Couliton	4	Mat	Relation to Roadway	8. Non intersection
Light Condition	4	Dations - Real Lighted	Interaction Type	1. Not all Internetition
Treffs Control Wesherital Device	1	Yes - Warking	Work Zone Related	2.56
Traffic Control Type		Traffic Lanes Marked	Wolt Zine Wolters Present	No.Provided
Readway Alignment	1	Statute Level	Work Zone Location	Not Provided
Rondway Burlace Condition	3	The l	Work Zone Type	HallProvided
Roadway Surface Type	2	Stanlarg, Asphall, Siluminous	Bahool Zane	2.50
Readerary Description	3	Two Hieg, Childel, Posible Median Sarie	Type of Collegos	8. Fired Olgosi - Of Reed

Cresh Description

C mil/300

VEHICLE #1 MAN OFF OF THE LEFT BHOULDER, ETRUCK ENMANNELS, THEN OVERTURNED.

C mail/200

Crash Report

Oriver Information	IVINGES.	Age 18				Valida	Information	Elen.	1			
	Drive's Aubus	40. Pell to Maint	his Proper C	land in			100			S. Sec Of Sect.		
of Driver Contribut	ing is the Cash	1. No Defects								State of Party in		
	Valor Discured						Finh	ing T	ine / Marit.	4. No Visible Real N	And Taxab	fail.
Type of Dr	Iver Chalcaulture						Vel	tile B	ody Type	1. Pessenger car		
Method of Alachy		1. Bulliot Bare	Constant							6 Tubel		
searches of marces	Chug Line									1. No Defecte		
	Driver's Liverse					River, I				L No Special Pund		
Commercial	Driver's Liverse	Not Personal						ener i	is service	Hel Applicable		
	Responent Used		der Balt					The	of Cover	Hel Applicable		
		1. Deployed - Pr					N.		Dealied			
F(m)	and from Vehicle	1. Not Fjarted				Cer	Non-Sile	d Moto	r Vehicle	16x		
	Cale of Dealb								Towed			
	injury Type	3. Move/Pearls	a jalmak						Versized.		_	yill No
	EMS Tanaport	Tes							Overhile		Under	tie No
	ummore leaved	1. Yes								C. Prod.		
									of Travel	Sed 38. Ran Of Read		
							~ ``	-		2. Nen Of Read		
	d Ballone	bha	alman A	LL Pee	and the second	a Age Cos	e1.			20. Onerlam (Roller	-	
	inst Aper	elland here	Rend	18.	B-IT I	18.21 H 2				Hed Provided		
	50	20	28		¢			Mod		30 Ormilario Baller		
Connected Motor Velo	Alle Configuration Cargo Body Type OVERLICENT	Ket Pendial Ket Pendial			lania () :		Crease	relat B	eser Care silverer et BM Care	·	Parent	No.
	M Parent Name								I description			
Carle Bellints												
	nice Carefaer Name											
	US DOTH / State											
Constantial/	Nos Concernial	Not Presided										
Parage Informati												
	EMS Transport						Laby					
	Date of Death						ag Daple	-				
Position	In J Co Valida					Species	d Bran 1					
								plat.	1.1.bu			

Clash ID₁₄₄8547

C mt/200

Crash Report

Coursel Number Revised Report	MONISTORY			Autobalian County of Crash	City of Northda		OPE LaL 38.843430	OPE Long.
Crash Date	Monday	03/15/2016	200	Landmarke al Roane	BUT BAMP			
City/Town of	Horbolk			Refrond Crossing ID				
Location of Crash	INTERSTAT	8 284 BART				Mile Harker Number	Man	riber of Vehicles
	HIGHWAY	water Hill of	100.00 P	well Bank of MILITARY		12.80		1

Credit Image



Paladian Hori	Pedestilan	0
Palations	Parlocation	0

Injuries Non-Pedestrian 1 Injuries Pedestrian D

Cresh Internation

Location of Pirel Hacroful Event	4	Finalitie	Roadway Defects	t	No Defecto
Weiller Condition		Boow	Relation to Roadway		Non-Internet Bon
Light Condition	4	Darkings - Read Lighted	Intervention Type	t	Not all Internetilion
Traffic Control Wesherstral Device	1	Yes - Working	Work Zone Related	2	140
Treffic Control Type		Tieffi Lance Marked	Web Zine Webers Present	H	d Provided
Readway Alignment	1	Statute Level	Work Zone Location	H	of Providend
Randway Burlace Condition	3	Binney	Work Zone Type	H	al Providenci
Roadway Burlana Type	2	Stantilop, Apphall, Silaminous	Bahool Zane	3	No.
Roadway Description	3	Two Hay, Oxided, Positive Median Sante	Type of Collision		Fixed Object - OF Read

Crash Description

VEHICLE I RAN OFF THE ROAD TO THE RIGHT AND ETRUCK THE BUT BON.

Crash200

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Crash Report

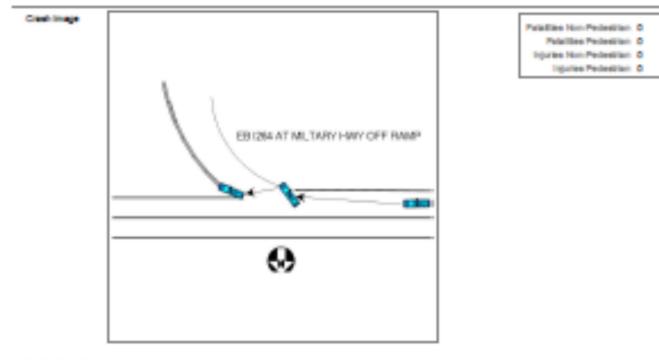
Drive Information contention	Age 28	Vehicle Information 1	
Diferents Autom	40. Put to Materials Proper Costs		
of Driver Contributing to the Cash		Versue Managerer	E Ren Of Rend - Rate
Diver Valor Olaourel	1. Not Channel	Booking Tim / Mark	4. No Visible Skill Mark/Tim Wark
Type of Driver Diskesillone	14. No Driver Distriction	Vehicle Body Type	1 Bernariani ani
Cristing	2 Detailing Obviously Dreak	Annual secol - The	
Wellood of Alashol Determination	2. Brack	Vehile Cenege	6. Tubled
Chiug User	1.8e	Vehicle Condition	
Diver's Ukerse		Rpes. Pundon Motor Vehicle	
Commential Driver's License			Hel Application
Bahly Byupmeril Uand	3. Lap and Shouldar Balt	Trush Cover	Hel Applicable
At Bag	2. Not Deployed	Vehicle Dealited	Yes
Resided from Vehicle	1. Not Pjacied	Commercial Motor Vehicle	No.
Date of Death		Towed	
Index Advantage	3. Move Peakle Injury	Oversided	
FMR Transport	No	Overhile	
Running (sound		Initial Impact Area	
		Direction of Travel	
		Crash Events: 1.	28. Ret Of Red
Read Balance	Mandaux dil B	assengers Age Court	8. Story, Tracks Stored
and the set	Build Burner I	A-17 1821 > 21	14. Dish
	M 31 0	0 0 0 4	Had Provided
_		Most Harmful	14. Dish
	-		
Weight over 10,000 De	No.	Sastell or more Na	Hamming Materials Planeri No
Commandal Motor Valida Sactors			
Vehicle Configuration			
Cargo Body Type		Liense Can	
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Crash Report

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Cresh Internation

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Randway Burlace Condition	2	Wal	Work Zone Type	No. Provided
Roadway Burlace Type	2	Stanlarg, Apphall, Stantoous	Bahool Zane	3.50
Readway Description	3	Two Way, Childel, Positive Median Sante	Type of Collaton	8. Fired Object - Of Read

Crash Description

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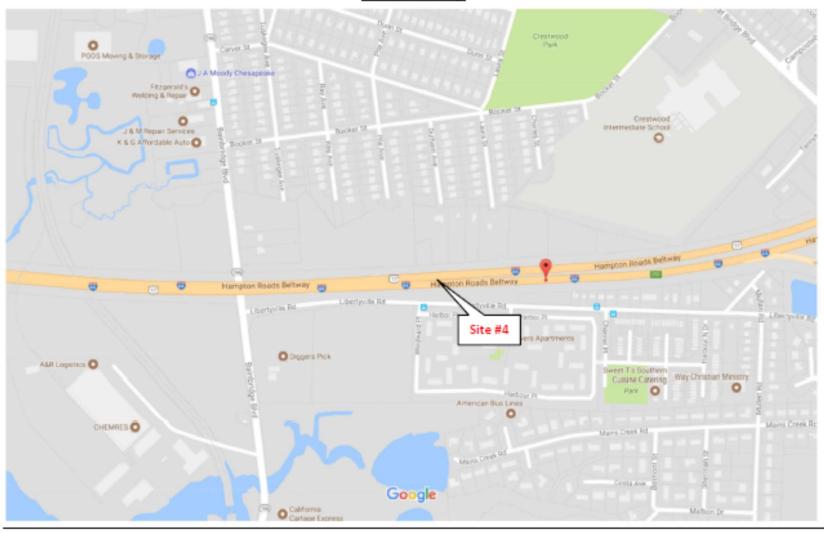
Crash Report

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Top 6 Hampton Roads Guardrail Hits Evaluations Site #4 <u>I-64 West toward VA Beach, Before Exit 292 to Rte. 17S, Left Shoulder</u>

Location Map





Description/Field Assessment

- The existing guardrail run consist of a SKT-SP GR-9 Run-on End Terminal attached to Standard GR-2 W-Beam rail extending
 underneath I-464 Overpass with a rolled buffered end treatment with no apparent anchor point. The existing overall length of
 the Guardrail run is Approx. 1,925' located at an offset of 5' from the edge of travel. The guardrail is protecting an overhead
 sign structure approx. 220' from the beginning of the guardrail run and offset approx. 10' from the Edge of Travel. This
 guardrail is also protection against cross over crashes.
- The calculated length of need required for the overhead sign structure is 150°.
- The Combined ADT is approx. 90,000.

Hits History

See Attach FR-300 report

Primary Issue

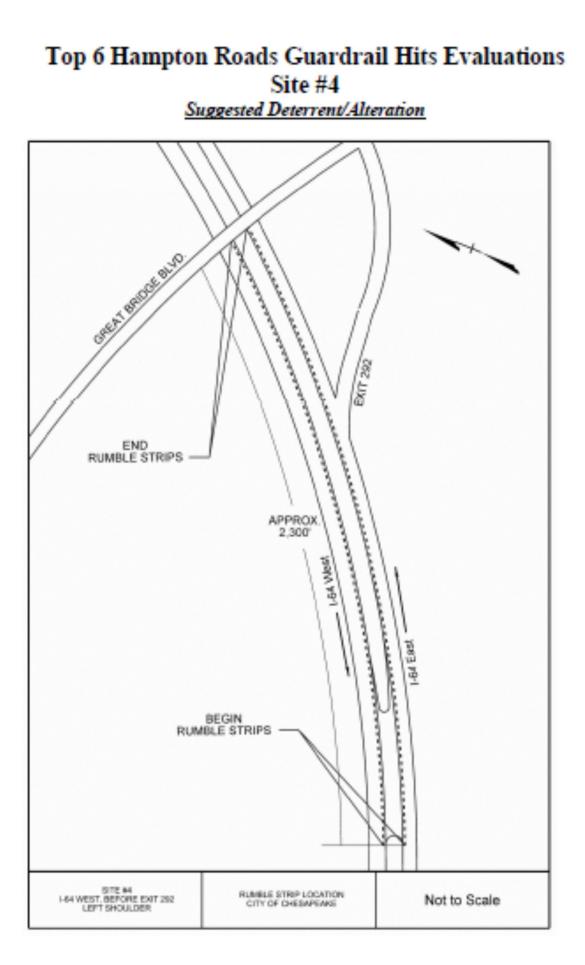
· It appears that most of the guardrail hits are due to human error, excessive speeds, driver inattention.

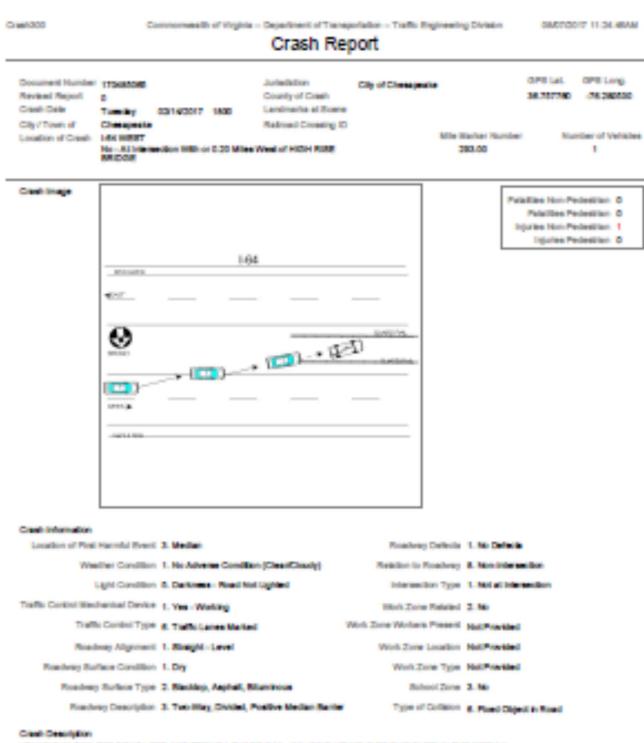
Suggested Recommendations/Ideas

- · This area will be reconstructed with the High Rise Bridge Project
- Shorten the Guardrail by 25[°].
- Possibly transition/taper the existing guardrail on both sides of the median to tie into one another in the middle of the median
 and terminate with an impact attenuator.
- · Add Rumble strips along the crossover and left shoulder
- Refresh and oversize Edge Line

Final Conclusion

- Traffic Engineering requested a rumble strip installation task order for this site and Sites 2 and 5. Installation and Maintenance
 reported that these sites did not include a sufficient length of rumble strip to meet the minimum length required to initiate a
 task order under the FY17 pavement marking on-call contract.
- The I-64 widening and High Rise Bridge replacement project kicked off in November 2017. According to the estimated schedule (as of January 18), road construction will begin in October 2018. If construction proceeds according to the initial concepts, Site 5 will be removed. Therefore no further improvements are recommended at this time.





VEHICLE &I BAN OFF BOAD LEFT AND STRUCK GUARD BAL, CAUSING VEHICLE TO FUP OVER IN THE MEDIAN.

Creek300

Commonwealth of Virginia - Department of Transportation - Traffic Brighteening Division 06/07/2017 11:34-88/AM

Crash Report

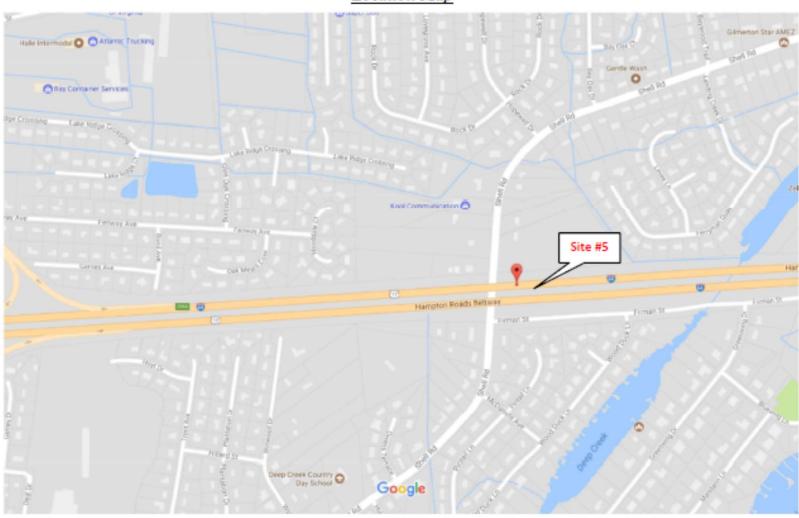
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Bafely Bougment Used	3. Lap and Elevabler Rule	Trust Cover	Hed Applicable
At Reg	1. Deployed - Presi	Vehicle Dealited	Yes
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Date of Death		Towed	
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Page 2 of 2

Top 6 Hampton Roads Guardrail Hits Evaluations Site #5 <u>I-64 East toward Suffolk, MM 295.4 before Shell Road, Left Shoulder</u>



Location Map



Top 6 Hampton Roads Guardrail Hits Evaluations Site #5



Description/Field Assessment

- The existing guardrail run consist of a SKT-SP GR-9 Run-on End Terminal attached to Standard GR-2 W-Beam rail terminated with an FOA attached to the overpass bridge above Shell Road. The existing overall length of the Guardrail run is Approx. 300' located at an offset of 5' from the edge of travel. The guardrail is protecting an overhead sign structure approx. 220' from the beginning of the guardrail run and offset approx. 13' from the Edge of Travel. The median cross slope is approx. 4:1.
- The calculated length of need required for the sign structure is 185'.
- The Combined ADT is approx. 90,000.

Hits History

See Attach FR-300 Report

Primary Issue

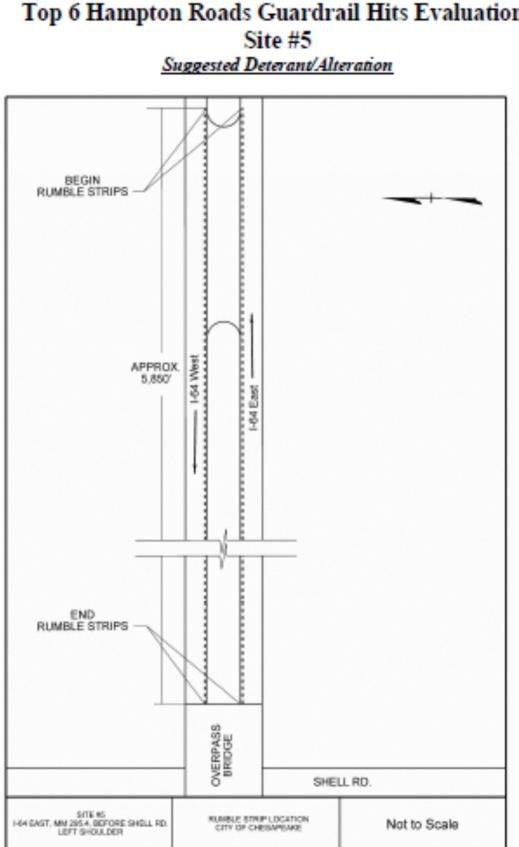
· It appears that most of the guardrail hits are due to human error, excessive speeds, driver inattention.

Suggested Recommendations/Ideas

- · This area will be reconstructed with the High Rise Bridge Project
- This site could be shortened 25' but it is doubtful this would alleviate the problem.
- Possibly replace the existing GR-9 End terminal with a Gr-7 End Terminal with a 4' Flare.
- Add Rumble Strip
- Refresh and oversize edge line

Final Conclusion

- Traffic Engineering requested a rumble strip installation task order for this site and Sites 2 and 4. Installation and Maintenance
 reported that these sites did not include a sufficient length of rumble strip to meet the minimum length required to initiate a
 task order under the FY17 pavement marking on-call contract.
- The I-64 widening and High Rise Bridge replacement project kicked off in November 2017. According to the estimated schedule (as of January 18), road construction will begin in October 2018. If construction proceeds according to the initial concepts, Site 5 will be removed. Therefore no further improvements are recommended at this time.

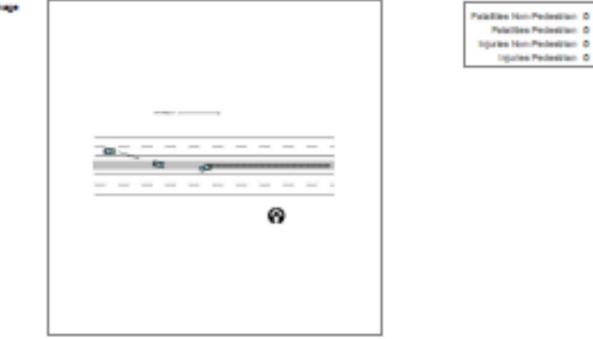


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Crash Report

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City/Town of Location of Creat-	Chesqueta	Rained Crossing ID		Mile Marker Number 291.00	Nat	iber of Vehicles





Cresh Internation

Location of Pirel Hanneld Event	2	Shoulder	Roadway Defects	1. No Defecto
Weather Condition	1	No Adverse Condition (Clear/Cloudy)	Relation to Roadway	8. Non intersection
Light Condition	2	Dayland	Intervention Type	1. Not all intersection
Traffic Control Mechanical Device	1	Yes - Working	Werk Zone Related	2.86
Treffic Control Type		Traffic Lance Marked	Wolk Zone Workers Present	Nat/Provided
Roadway Alignment	1	Straight - Level	Work Zone Location	No.CP rowtabled
Roedway Bufface Condition	1	Day	Work Zone Type	No. Provided
Roadway Burlace Type	2	Stantilop, Apphall, Siluminous	Bahool Zone	3.50
Roedway Description	3	Two Hay Childel, Postive Median Banke	Type of Collabora	8. Fixed Object - Of Road

Crash Description

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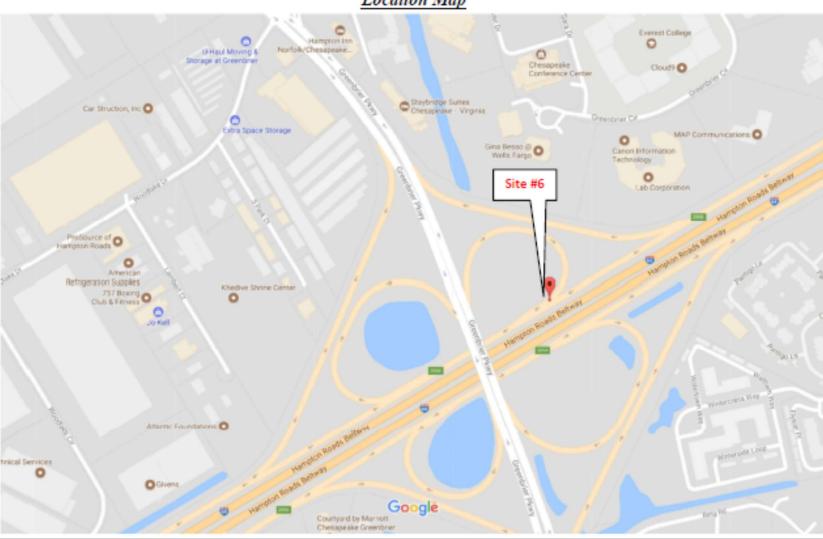
Crash Report

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Top 6 Hampton Roads Guardrail Hits Evaluations Site #6 I-64 East toward Suffolk, at Greenbrier Pkwy., Right Shoulder



Location Map





Description/Field Assessment

- The existing guardrail run consist of a SRT-350 6 post GR-7 Run-on End Terminal attached to Standard GR-2 W-Beam rail terminated with an FOA attached to the Headwall under the Greenbrier Pkwy Overpass. The existing overall length of the guardrail run is Approx. 365' located at an offset of 8' from the edge of travel. The guardrail is protecting the motorist from a steep embankment front slope of approx. 3:1 - 2:1, the breaking point of the slope is approx. 15' from the edge of travel and the non-recoverable area is approx. 145' from the beginning of the guardrail run. This barrier is also protecting an overhead sign structure approx. 215' from the beginning of the guardrail run and offset approx. 17' from the back of the structure to the Edge of Travel.
- The calculated length of need required for the sign structure is 159'.
- The calculated length of need required for the embankment is 140'.
- The Combined Mainline ADT is approx. 95,000.
- The ramp ADT is approx. 29,000.

Hits History

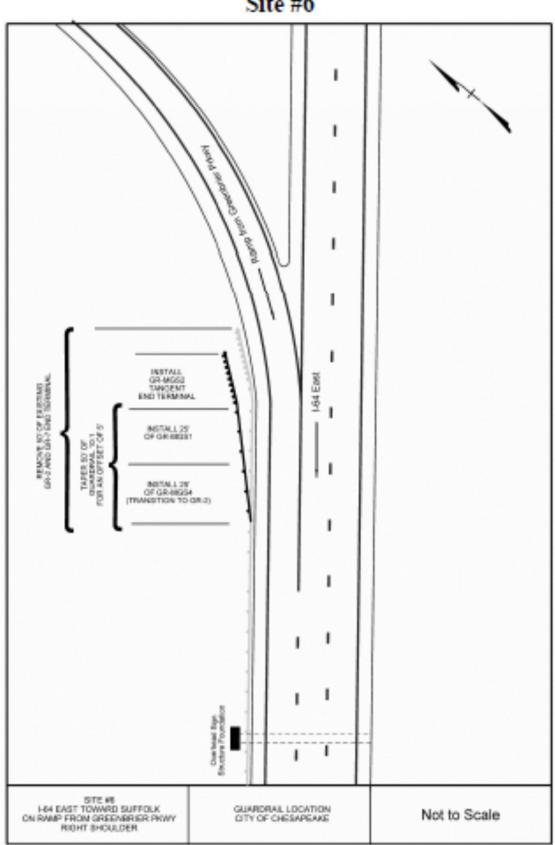
- 6 damage reports in HITS/TAMS records
- No crashes reported/documented in RNS over the past 3 years.

Primary Issue

- 2 hits were noted as weather related.
- Possible maintenance equipment damage.

Suggested Recommendations/Ideas

- Since this area is adjacent to an acceleration lane the acceleration lane could be included as part of the clear-zone as per the AASHTO Road Design Manual Chapter 3 Section 3.1, thus the length of need would shorten dramatically therefore the guardrail run could be shortened by 25'.
- Possibly flare the first 50' of GR-2 at a rate of 10:1 which would offset the GR-7 end terminal 5' from its current position
 placing it at a 13' offset from the edge of travel.
- Refresh and oversize edge line
- · Add hatch lines along the right shoulder
- Add delineators on the right shoulder



APPENDIX A

SAFETY REVIEWS



COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION HAMPTON BOADS DISTRICT THE NUMBER AND DOD

Charles A. Kilpatrick, P.E. Conmissioner

November 8, 2017

MEMORANDUM

TO: Ms. Debbie Lenceski, P. E.



FROM: Mr. Robert A. Weber III, P.E., PTOE

SUBJECT: Safety Review (VR-Vari-20170727-05) Top 6 Quard Rail Hit Locations Various Locations in Hampton Roads District

This is in response to the request for Traffic Engineering to provide comments to determine if additional safety improvements are needed for the discussed top six guardrall hit sites.

The engineering review was conducted of each location and consisted of a field review & an analysis of the most recent guardrail related crashes in each of sites. The findings are as follows:

Site 1: Route 58 & Snowden Road

The field review revealed signing and povement markings to be working condition. Sight distance at the intersection exceeded the recommended guidelines as outlined in AASEITO's Green Book. A review of the BNS database revealed three (3) guardrail related crashes within the last five years as follows:

- Guardrail strike subsequent to angle crash when crossing vehicle failed to yield to traffic on Route 58
- Guardrail strike following evasion of another vehicle changing lanes abruptly into the path of the vehicle that struck the guardrail
- Guardrail strike by officacking semi-trailer making tight turn onto Route 58

These crashes were determined not to be correctable by signing or pavement markings. Traffic Engineering concurs with the assessment by Traffic Safety and no additional signing or pavement markings are recommended.

Site 2: I-64E Exit 276 Gare

The field review revealed trailblaging for the exit adhered to the guidelines as outlined in MUTCD and FHWA guidelines. In reference to the specific question about the location of the Exit Direction (execution) sign, such a sign is typically located at the theoretical gore for the exit,

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or slightly ahead of that location if the gore is blocked by an overhead structure. The existing exit direction sign is located approximately 85 feet prior to the theoretical gore. However, numerous guide signs found along I-64E add to sign clutter in the vicinity of the enit. Also, the exit lane also shares traffic from an on-ramp from NAS Norfolk creating a weaving condition. A review of the RNS database revealed one (1) related guardrail creat within the last five years, a singlevehicle roadway departure for unreported reasons. Traffic Engineering recommends altering the pavement by replacing the dashed white lane line with a dotted white lane line from the enit gore to the entrance gore. Elatching of the gore area at the exit is also recommended to increase comprehension by approaching drivers of the upcoming diverge condition. This sheald increase the conspicality of the exit and denote the lane as an off-ramp.

Site 3: I-264E Exit 13B

A ball hank limiting study showed advisory speeds to be appropriate. Chavrons were missing but have been recently replaced. However, the signing height is excessively high. Due to the lack of adequate length and sharing of the acceleration/deceleration for the both on-ramp and off-camp of Military Highway causing numerous traffic conflicts by traffic weaving, this area's safety concerns cannot be easily corrected by signing alone. A review of the RNS database revealed twenty-aight (28) related guardrail crashes within the last five years. The significant number of crashes supports the reasoning that the lack of adequate deceleration for the off-ramp is one of the main causes of the crashes. Though an increase in deceleration length may not alleviate all. crashes due to encessive speeds, it will improve the safety of the off-ramp by providing time and physical space to complete the traffic weaving and the necessary reduction in speed to safely maneuver onto the off-ramp. According to AASEITO's Green Book, using Avoidance Maneuver-E decision sight distance is recommended to be 1135° at 55 MPH. A review of the readability of the overhead signage for exit 13B showed legibility read just after the N Military Highway overpass. This results in a sight distance of 700°. With a shared lane of less than 450° and less than recommended decision sight distance, crashes will most likely continue unless the ramps are physically changed or a significant reduction of speed is achieved. Therefore, Traffic Engineering can only recommend adjusting the chevrons to height of four feet or just above the guardrail for headlight visibility.

Site 4: 1-64 W Left Shoulder prior to Exit 292

The field review revealed signing and pavement markings to be in working condition for the exit. Roadway geometry and sight distance should not be a factor as neither affects the visibility of guardrail. A review of the RNS database revealed one (1) related guardrail orash within the last five years. Traffic Engineering concurs with Traffic Safety's assessment of driver inattention or excessive speed as the leading cause for crashes and does not recommend any additional signing or pavement marking improvements.

Site 5: I-64E MM 295.4 Left Shoulder

The field review revealed signing and pavement markings to be in working condition for the area. Roadway geometry and sight distance should not be a factor as neither affects the visibility of guardrail. A review of the RNS database revealed one (1) related guardrail crash in the last five years. Traffic Engineering concurs with Traffic Safety's assessment of driver inattention or aggressive driving as the leading factor for crashes and does not recommend any additional signing or pavement marking improvements.

Site 6: I-64E Exit 290 on-ramp from NB Greenbrier Parkway

The field review revealed signing and pavement markings to be in working condition for the area. Roadway geometry and sight distance should not be a factor as neither affects the visibility of guardrail. A review of the RNS database revealed no related guardrail crashes within the last five years. Traffic Engineering concurs with Traffic Safety's assessment of driver inattention or excessive speed as the leading factor for crashes and does not recommend any additional signing or pavement marking improvements.

The engineering data collected was compiled by John Alcaide, Engineering Technician. Please notify this office should you need further information regarding this matter.

Weber, Robert, PE (VDOT)

From: Sent:	Lanceski, Deborsh PE (VDOT) Wednesday, July 26, 2017 3:32 PM
To:	Weber, Robert, PE (VDOT)
Oc:	Convin, Mike A, PE (VDOT)
Subject:	HR Frequently HILGR Sites

Rob,

As discussed this morning, we have several sites on this list that you need to review. The full list can be found at GATraffic/Guardrall MASH transition/Hampton Roads- Most Hit GR Sites, docs

The specific items needed from you and your group are

Location 2

- F8-300 review
- Review of the guide signs at the gore and in advance of the exit. Specifically, there are concerns that the

execution sign is too late and that there is not enough information to keep i-64 traffic on the bend to the left. Location 3

Would it be appropriate to add some chevrons on this ramp?

F8-300 review

Location S

F8-300 review

Let me know if we need to discuss these. Let will be preparing details of any improvements we want to recommend.

Thank you

Deborah Lencecki, Pli Hampton Roads District Assistant District Traffic Engineer (757)925-2571 – office (757)359-0188 - cell Deborah Lenceckieftydot virginia.gov