

# **Legislative Study on Oversize/Overweight Vehicle Permit Issues**

Act. 149 of 2020, Sec. 26(b)



Policy, Planning, and Intermodal Development Division

219 N. Main St.  
Barre, VT 05641  
802-828-2784  
[www.aot.state.vt.us](http://www.aot.state.vt.us)

January 15, 2021

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## EXECUTIVE SUMMARY

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This report addresses the following questions posed in Section 26(b) of Act 149 (2020) related to oversize and overweight permits required for vehicles traveling on Vermont highways:

- (A) identify any safety or financial implications to infrastructure, including bridges, culverts, pavement, and roadways, or jurisdictional issues for class 2 town highways if municipal permits currently required by municipalities are not required for vehicles that are allowed on State highways without a permit;*
- (B) identify any safety or financial implications to infrastructure, including bridges, culverts, pavement, and roadways, if an additional permit or permits are not required when a wrecker, as defined under 23 V.S.A. § 4(76), is towing one or more disabled vehicles and the wrecker and disabled vehicle or vehicles individually do not exceed the limitations imposed by 23 V.S.A. chapter 13, subchapter 15, article 1 or are lawfully operating under a blanket permit;*
- (C) make recommendations on any limitations, including distance towed, or conditions that should be imposed if an additional permit or permits are not required in the situation identified in subdivision (B) of this subdivision (1); and identify any safety or financial implications to infrastructure, including bridges, culverts, pavement, and roadways, if 23 V.S.A. § 1432(c) is repealed; and*
- (D) identify any safety or financial implications to infrastructure, including bridges, culverts, pavement, and roadways, if 23 V.S.A. § 1432(c) is repealed.*

Although related to some aspect of oversize or overweight permits, these sections of the Act contain three unique questions that are independent from each other and are addressed in separate sections of the report. The Executive Summary presents the findings. Additional background information and the methodologies are detailed in the body of the report.

### **Class Two Town Highway Overweight Permits**

Section 26(b)(1)(A) of Act 149 asks the Agency of Transportation to identify the financial and safety implications to highway infrastructure, as well as jurisdictional issues, if a municipal overweight permit is not required for vehicles traveling on class two town highways. Currently, an overweight permit is required from municipalities when the gross vehicle weight exceeds 24,000 pounds, which is the statutory weight limit for class two town highways. To accommodate vehicles that are permitted to travel on state highways without an overweight permit, class two town highways would need to be able to accommodate a gross vehicle weight of 80,000 pounds, the statutory weight limit for state highways.

Most class two town highways have been improved incrementally over many years and are not supported by a road base or pavement that have been engineered to accommodate 80,000 pounds. Bridges and culverts on class two town highways would also need to be reconstructed to accommodate the increased load. The total estimated cost to increase the weight limit on class two town highways from 24,000 to 80,000 pounds is \$3.15 Billion. The annual cost would be \$105 million assuming reconstruction occurs over thirty years.

The total annual cost would need to be covered by local property taxes (\$29.3 Million), the state transportation fund (\$67.1 Million), and federal transportation funds (\$8.5 Million). To cover these costs, the average municipal tax rate would increase by six cents per 100 dollars of assessed value, or 22%. Municipal cost impacts would vary significantly due to the variation in miles of class two town highways, number of structures and tax bases throughout the state. The state gasoline and diesel

taxes would need to increase by seventeen and twenty cents, respectively. The annual federal cost share would have to be diverted from other projects and programs.

Although there are some challenges to administering local overweight permits, municipalities expressed a desire to maintain control over where and when trucks can travel on their roads, especially during mud season, and to avoid residential or other activity areas that are more sensitive to trucks. The Department of Motor Vehicles is currently developing an online permitting system that will provide 24-hour-a-day access to apply for, obtain, and pay for required weight and length permits issued by the Vermont Agency of Transportation. The online system will include the municipal overweight permit in the future and offers the opportunity to address local administrative challenges and improve the service provided to permit applicants.

## Permits for Wreckers Towing Disabled Vehicles

The questions in Sections 26(b)(1)(B) and (C) of Act 149 are related to the situation that occurs when the combined size or weight of a wrecker towing a disabled vehicle exceeds the State's statutory limits. In this situation, a wrecker can tow the disabled vehicle without an oversize/overweight permit only to the nearest location where the disabled vehicle can be safely parked. Before moving to a repair destination, the components of a disabled vehicle could be moved separately without a permit if the individual components and the wrecker do not exceed the statutory weight limits. If that is not possible, an oversize or overweight permit is required for the final move to the repair location.

The question asks the Agency to identify the safety and financial implications if a blanket permit, with certain conditions was provided that allowed wreckers to move a disabled vehicle directly to its final repair destination. The question also asks for recommendations on any limitations such as distance traveled and other conditions that would be required in the blanket permit.

The location and frequency of events that require a wrecker to recover a large disabled vehicle are random, as are the routes they would follow to the repair destination. Given this level of uncertainty, the financial and safety implications are considered from a broader risk perspective.

The purpose of an overweight and oversize permit is to identify appropriate routes to reduce the risk of highway infrastructure damage and the related financial impacts and to avoid safety impacts. The chance that a wrecker towing a disabled vehicle will encounter a large or short span bridge in poor condition today on interstate and non-interstate state highways is 1% and 5% respectively. This chance could be as high as 10% in the future, or perhaps higher if the Agency is unable to meet performance targets.

Safety risks are created when an oversize vehicle travels through locations with non-standard highway geometry and alignment characteristics that may require encroaching into an opposing lane, abrupt and unexpected changes to traffic flow, or that create an obstacle that blocks the move. There is a 12% to 30% chance that an oversize load will encounter a physical restriction at a bridge, such as limited width or a challenging approach alignment. Other non-bridge locations along the highway system with limited width, height or other physical constraints that may impact safety exist and are arguably common and likely to be encountered when a wrecker moves a disabled vehicle. Safety through work zones, which are widely dispersed throughout the state during the construction season, is also a risk given that almost 30% of work zone crashes involve trucks.

Of the three adjacent states, New Hampshire and Massachusetts have similar requirements to Vermont. New York State offers a blanket permit. Based on a review of New York's blanket permit conditions and other states that offer some type of exception, the following conditions should be considered in a blanket permit if one is made available in Vermont:

- Distanced traveled from where the disablement occurs to a repair or safe parking location range from 10 to 100 miles. Based on the size of the state, a 75-mile limit may be appropriate for Vermont.
- Special weight limits specified include none, and maximum gross vehicle weights of 100,000, 145,000, 150,000 and 160,000 pounds. There are also various limits for the steer, rear, and tandem axles.
- The tow vehicle should weigh more than the disabled vehicle and its length should not exceed 40 feet.
- The individual weights of the tow truck and the disabled vehicle cannot exceed statutory weight limits.
- Include in the permit a list of restricted bridges that cannot be crossed.
- Limit blanket permits to overweight vehicles. Do not provide blanket permit for oversize vehicles. Structures are designed with factors of safety that can accommodate some variation in the loads they can accommodate. However, there are no factors of safety for height limits.

## US Route 4 Overlength Permit

Section 26(b)(1)(D) of Act 149 asks to identify the safety and financial implications to highway infrastructure if the unique overlength permit that is required along US 4 from the New Hampshire border, through Hartford, Hartland, and Woodstock to VT Route 100-South in Bridgewater is repealed. The US 4 Overlength Permit requires a permit from the VT Department of Motor Vehicles for vehicles that are between 68 to 75 feet long. For all other state highways, an overlength permit is not required for vehicles up to 75 feet long.

The Overlength Permit causes some tractor trailer operators to avoid US 4. There are approximately 191 tractors trailers traveling on US 4 between I-89 and VT 100-South on an average day. The number of tractor trailers decreased by approximately 41 trips per day after the US 4 Overlength Permit went into effect in 2000.

Truck operators that avoid US 4 increase their trip lengths by an estimated average of 5.4 miles resulting in an annual increase of approximately 81,200 truck miles of travel on all other highways. The resulting net increase in pavement and bridge maintenance costs due to these extra truck miles is between \$27,381 and \$31,670 per year depending on how much of a truck's diesel fuel (and related diesel fuel tax) is purchased in Vermont. If the permit is repealed, these costs could be avoided. Additional external costs savings of \$10,809 per year would accrue to individuals and public agencies due the avoided costs of congestion, crashes, noise, air pollution, and greenhouse gas emissions created by the additional miles traveled by diverted trucks.

From 2010 to 2019, there were 30 crashes involving tractor trailers on US 4 from NH to VT 100-South. The ratio of tractor trailer crashes to truck miles of travel is significantly lower than the national averages for total crashes, crashes resulting in an injury, and property damage only crashes. One fatality occurred in 2013 in Hartford when the driver crossed into the opposing lane and crashed into an oncoming tractor trailer head-on. Given the relatively low number of truck trips in Vermont in general, and along the US 4 corridor specifically, even a single fatality results in a fatality crash rate that is higher than the national average. In 2014, centerline rumble strips were installed between Woodstock Village and the US 4 intersection with US 5 in White River Junction which has helped reduce the potential for similar collisions since then and will continue to do so into the future. The truck crash rate comparison demonstrates that US 4 is not less safe than other roads and should be able to safely accommodate the estimated daily increase of 41 truck trips per day that may occur if the permit is repealed.

Of the 30 crashes that occurred between 2010 and 2019 along this section of US 4, ten were in Woodstock Village. The crashes resulted in property damage but no injuries or fatalities. It is

common for crash frequencies to increase in areas with more roadside activities, such as Quechee Gorge and Woodstock Village. However, the situation where arterial highways pass through denser activity areas is not unique to the US 4 corridor or particularly acute. The intersection of US 4 with Hartland Hill Road in Woodstock Village is the one location with a consistent crash pattern that is directly related to larger tractor trailers. Crashes at the US 4-Hartland Hill Road intersection could be reduced with changes to its design.

## 1.0 INTRODUCTION

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This report addresses the three questions posed in Act 149 of 2020 Section 26(b) related to oversize and overweight permits required for vehicles traveling on Vermont highways pursuant to 23 VSA Subchapter 13 – Operation of Vehicles. Although related to some aspect of oversize or overweight permits, each question is unique and independent from each other and are addressed in separate sections of the report.

The question posed in Section 26(b)(1)(A) is related to overweight permits required for operators of vehicles traveling on class two town highways that exceed the current statutory weight limit of 24,000 pounds of gross vehicle weight for class 2 and 3 town highways. An overweight permit is required from the municipality of jurisdiction for vehicles that exceed the 24,000-pound limit. The question asks to identify the financial and safety implications to highway infrastructure if a municipal overweight permit is not required for vehicles traveling on class two town highways with a gross vehicle weight up to the state highway limit of 80,000 pounds.

Sections 26(b)(1)(B) and (C) are related to the situation that occurs when the combined size or weight of a wrecker towing a disabled vehicle exceeds statutory size and weight limits. When the combined size or weight limits are exceeded for wreckers towing a disabled vehicle, they can travel without a permit only to the nearest location where the disabled vehicle can be safely accommodated without restricting travel along a roadway. The question asks to identify the safety and financial implications if a blanket permit, with certain conditions was provided that allowed wreckers to move a disabled vehicle directly to its final repair destination. The question also asks for recommendations on any limitations such as distance traveled and other conditions that would be required in the blanket permit.

Section (b)(1)(D) asks what the safety and financial implications would be to highway infrastructure if the overlength permit required along US 4 from the New Hampshire border, through Hartford, Hartland, and Woodstock to VT Route 100-South in Bridgewater is repealed. For all other state highways, an overlength permit is not required for vehicles up to 75 feet long. The US 4 Overlength Permit is required for vehicles that are between 68 to 75 feet long.

A chapter of the report addresses each question. The report provides background information on each question, presents an analysis and summarizes findings.

## 2.0 CLASS TWO TOWN HIGHWAYS

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### 2.1 Background

Section 26(b)(1)(A) of Act 149 (2020) asks the following question:

*[I]dentify any safety or financial implications to infrastructure, including bridges, culverts, pavement, and roadways, or jurisdictional issues for class two town highways if municipal permits currently required by municipalities are not required for vehicles that are allowed on State highways without a permit.*

Vehicles with a gross weight up to 80,000 pounds can travel on state and class one town highways without an overweight permit from the Department of Motor Vehicles. The allowable weight limit on class two and all other town highways is 24,000 pounds as specified in 23 VSA § 1392. Pursuant to 23 VSA § 1400(a), operation of a vehicle on a class two town highway that exceeds this weight limit requires an overweight permit from the municipality of jurisdiction. Allowing vehicles to travel on



class two town highways without a municipal permit equates to increasing their allowable gross weight limit from 24,000 pounds to 80,000 pounds.

There are 2,791 miles of class two town highways in Vermont. As defined in 19 V.S.A. § 302, class two town highways are the most important local roads in a town and connect two or more municipalities and places which by their nature have more than a normal amount of traffic. They collect traffic from class three town highways (primarily residential streets in more dense cities and back roads in rural towns) and connect them to local and regional destinations and to the state highway system for longer distance trips. With a few exceptions, class two town highways are two lane roads, most have paved surfaces, and posted speeds vary from 25 to 35 mph through villages and other activity centers to 45 mph through rural areas. Travel lanes widths vary from nine to eleven feet with narrow shoulders between one and two feet wide. Class two town highways have less traffic and slower speeds than state highways and are therefore attractive to pedestrians and bicyclists. Improved incrementally over many years, most class two town highways do not have engineered road bases and pavements, which is why their allowable load is significantly less than the allowable load on state highways.

## 2.2 Financial Implications

The financial analysis assumes that all 2,791 miles of class two town highways in Vermont will need to be reconstructed to a standard that can accommodate a vehicle with a gross weight of 80,000 pounds. The estimated cost to upgrade a two-lane highway to accommodate an 80,000-pound vehicle is \$1,000,000 per mile based on the Agency's recent experience with a roadway project on the state highway system with characteristics that are like a typical class two town highway<sup>1</sup>.

The financial analysis includes the cost to reconstruct all bridges on class two town highways with spans greater than twenty feet (long structures) that currently have allowable loads less than 80,000 pounds. Long structures on the town highway system are eligible for federal funding and are inspected every two years by the Agency. Based on the information available in the inspection reports, there are 315 out of 539 long structures on class two town highways with allowable gross weight limits less than 80,000 pounds. The cost to reconstruct these bridges was estimated by applying a unit cost of \$650 per square foot of deck area based on the Agency's historical bridge replacement costs and includes design, permitting, right-of-way acquisition, traffic control and construction. The list of long structures is provided in Appendix A.

Based on inventories conducted by municipalities<sup>2</sup>, there are 186 short structures on class two town highways. Short structures are bridges and large culverts that have spans between six and twenty feet. Details on the size of the deck area and existing load ratings are not available in the municipal inventories. For this analysis, it was assumed that every short structure needs to be replaced to accommodate an 80,000-pound vehicle. The deck area is assumed to be the average of the high and low ranges of short structure spans (13 feet) by a typical roadbed width of 24 feet. The reconstruction cost is equal to \$650 per square foot multiplied by the deck area.

There are thousands of small culverts on class two town highways. However, they are not included in the estimate because a complete inventory is not available.

The total cost to reconstruct all class two town highways in Vermont including long and short structures is estimated to be \$3.15 Billion (Table 1). Assuming implementation occurs over thirty years, the total annual cost is estimated to be \$105 Million (Table 2).

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<sup>1</sup> [LONDONDERRY-CHSTR STP PS19\(10\)](#). Work performed includes coarse milling, cold-in-place recycling and paving of the existing highway, new pavement markings, guardrail, signs, drainage and other related highway items.

<sup>2</sup> <https://vtculverts.org/>

Table 1: Total Costs to Increase Class 2 TH Load Limit to 80,000 Pounds

Roadway Component	Federal	State	Local	Totals
Roadway reconstruction	0	\$1,953,700,000	\$837,300,000	\$2,791,000,000
Long Structures	\$256,241,492	\$32,030,187	\$32,030,187	\$320,301,865
Short Structures	0	\$26,404,560	\$9,430,200	\$37,720,800
<b>Totals</b>	<b>\$256,241,492</b>	<b>\$2,012,134,747</b>	<b>\$878,760,387</b>	<b>\$3,149,022,665</b>

Table 2: Annual Costs Assuming 30-Year Implementation

Roadway Component	Federal	State	Local	Totals
Roadway reconstruction	\$0	\$65,123,333	\$27,910,000	\$93,033,333
Long Structures	\$8,541,383	\$1,067,673	\$1,067,673	\$10,676,729
Short Structures	\$0	\$880,152	\$314,340	\$1,257,360
<b>Totals</b>	<b>\$8,541,383</b>	<b>\$67,071,158</b>	<b>\$29,292,013</b>	<b>\$104,967,422</b>

Federal, State and Local cost shares vary based on the funding program. Long structures are eligible for 80% federal funding under the Town Highway Bridge Program with 10% local and state matches. The roadway reconstruction projects are assumed to be funded by the State's Class Two Town Highway Grant Program. Short structures are assumed to be funded by the Town Highway Structures Grant Program. Each of these programs provides a maximum grant up to \$175,000 per project. Federal funds are not available with these programs. The average local cost share is 30% and 25% for the Class Two Town Highway and Town Highway Structures programs respectively.

The annual local cost shares were estimated for each municipality in Vermont based on the mileage of class two town highways and the number of long and short structures on class two town highways within their boundaries. The costs were divided into the 2019 grand list of each town and compared to the 2019 municipal tax rate (Attachment B). To cover these costs, the average municipal tax rate would increase by six cents per 100 dollars of assessed value, or 22%. Local cost impacts vary significantly due to the variation in miles of class two town highways, number of structures and tax base throughout the state (Table 3 and Figure 1).

Table 3: Impact on Municipal Tax Rates

Increase in Tax Rate	Number of Towns	Percentage of Towns
Less than 3%	49	19%
3% to 10%	81	32%
10% to 20%	89	35%
20% to 50%	31	12%
More than 50%	5	2%
<b>Totals</b>	<b>255</b>	<b>100%</b>

Given that the purpose of the upgrades to class two town highways is to accommodate heavier vehicles most of which use diesel, it is informative to estimate the increase to the diesel tax if it is the only source of revenue used for the state's cost share of the upgrades. Under this scenario, the increase in the diesel tax would be \$1.02 per gallon, an exceptionally large increase when compared to the current rate of 32 cents per gallon (Table 4).

Table 4: Impact on Diesel Tax Assuming it is the Only Funding Source for the State's Cost Share of Class 2 TH Upgrades

Annual State Share of Class 2 TH Upgrades	\$67,071,158
Gallons of Diesel sold in 2019	65,957,707
Increase Required to Pay for State Share of Class two town highway Upgrades	\$1.02

If the state's cost share is covered by both gasoline and diesel taxes in proportion to the revenue they generate, the gas tax would need to increase by 17 cents per gallon and the diesel tax by 20 cents per gallon (Table 5). These increases are also significant relative to Vermont's average gasoline tax of 25 cents per gallon<sup>1</sup>, and the 32 cents per gallon diesel gas tax.

Table 5: Impact on Gas and Diesel Tax in Proportion to Revenue Generated

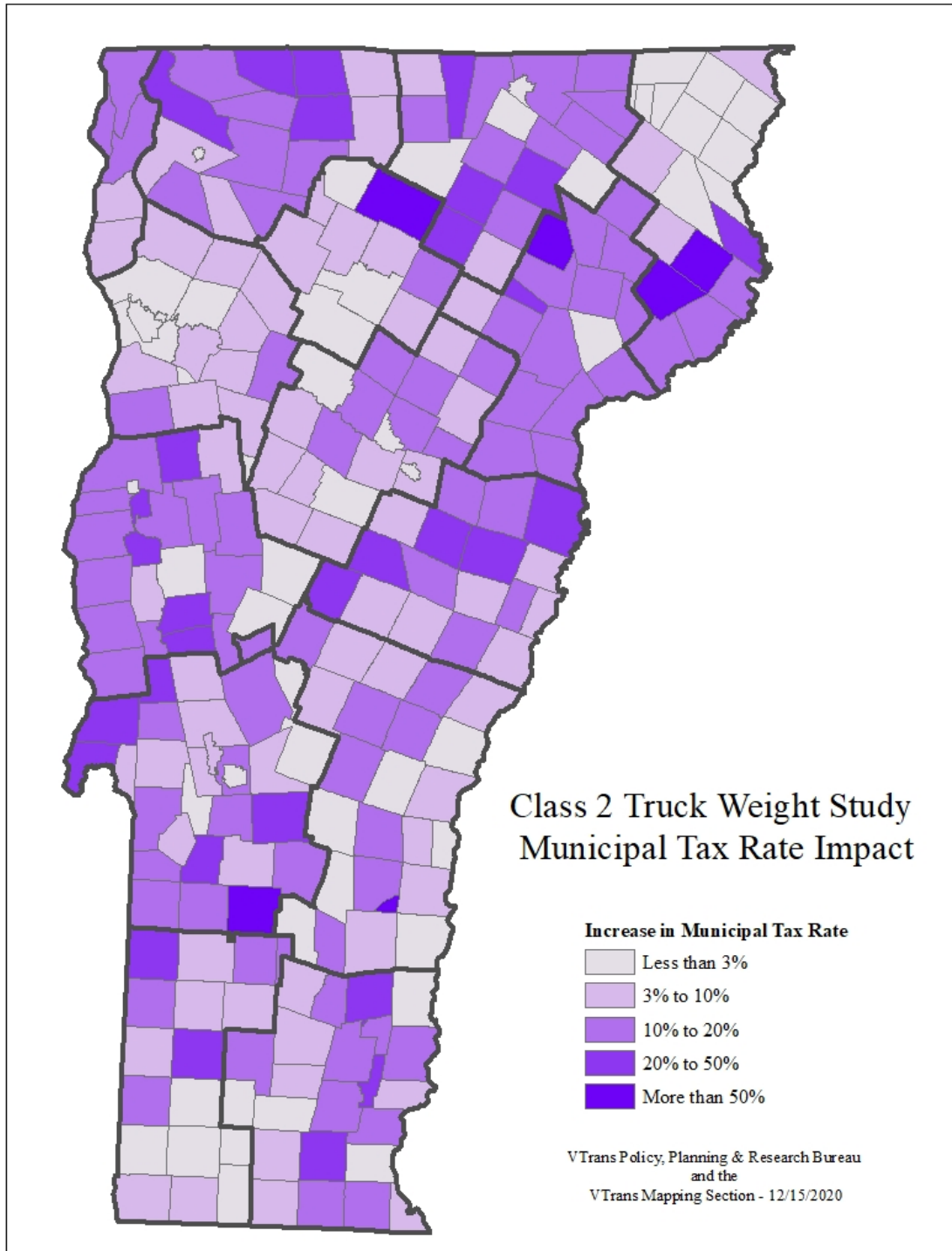
Description	Gas Tax	Diesel Tax
Revenue Generated in 2019 (Millions) <sup>2</sup>	\$77.80	\$18.60
Share of Combined Gas and Diesel Tax Revenue	81%	19%
Proportional Share of State Cost to Upgrade Class two town highways	\$54,130,043	\$12,941,116
Gallons Sold in 2019 <sup>3</sup>	314,671,179	65,957,707
Increase Required to Pay for State Share of Class two town highway Upgrades	\$0.17	\$0.20

<sup>1</sup> VT's gas tax is a composite of 13.1 cents per gallon plus 4% of the retail price with a floor and ceiling of 13.4 and 18 cents per gallon respectively. The average gas tax is calculated based on the total revenue generated in 2019 of \$77.80 Million and total gallons sold of 314,671,170.

<sup>2</sup> [August 2020 Economic Review and Revenue Forecast Update](#), Prepared for the State of Vermont Emergency Board and Legislative Joint Fiscal Office, Kavet, Rockler & Associates, LLC; August 12, 2020

<sup>3</sup> [Dec 2019 Gasoline & Diesel Gallons Sold](#); Neil Schickner, Senior Fiscal Analyst, Joint Fiscal Office; February 10, 2020.

Figure 1: Impact on Municipal Tax Rates to Upgrade Class Two Town highways to Accommodate 80,000 Pound Vehicles



## Jurisdictional and Other Issues

The VT League of Cities and Towns conducted a survey of its members in 2015 to gather feedback on the possibility of centralizing the administration of municipal overweight permits. Eighty municipalities responded. In addition to feedback on the centralization question, many of the comments help define some of the challenges with administering local permits and the importance of maintaining local control over truck routes. Not all municipalities have an overweight permit process in place, although the exact number is not documented. Challenges include a permit fee that does not cover administration costs structure (\$5 for single trips and \$10 for fleets) and some municipalities, especially in rural areas, may not have enough staff available to manage the permitting process. Despite these challenges, many municipalities expressed a desire to maintain control over where and when trucks can travel on local roads, especially during mud season, and to avoid residential or other activity areas that are more sensitive to trucks. The permit also provides an opportunity for a municipality to impose other restrictions to help recover costs to a badly damaged road.

While state and municipal overweight permits are triggered by different gross weight thresholds, they share the same purpose to ensure that highways used by an overweight vehicle can safely accommodate the excess loads and without causing significant damage. Local overweight permits may be inconvenient for vehicle operators and municipalities, but it is a more cost-effective approach than building all class two town highways to accommodate 80,000-pound vehicles. If the State and municipalities were to raise over \$100 million per year, there are other pressing needs across all modes that should be addressed first.

Act. 149 § 26(a) requires the DMV Commissioner to develop an online permitting system that provides 24-hour-a-day access to apply for, obtain, and pay for required weight and length permits issued by the Vermont Agency of Transportation. Section 26(a) also directs the DMV Commissioner to incorporate municipal overweight permits into the centralized system in a future phase. Assuming the centralized system maintains local control over designation of routes, it should help reduce the administrative burden, while also making it easier for vehicle operators to acquire permits.

### 2.3 Summary

Allowing vehicles that can currently travel on the state system without an overweight permit to travel on class two town highways without a municipal overweight permit would require increasing their allowable loads from 24,000 to 80,000 pounds. Most class two town highways have been improved incrementally over many years and are not supported by a road base or pavement design engineered to accommodate the load increase. Bridges and culverts on class two town highways would also need to be reconstructed to accommodate the increased load. The total estimated cost to increase the weight limit on class two town highways from 24,000 to 80,000 pounds is \$3.15 Billion. The annual cost would be \$105 million assuming reconstruction occurs over thirty years.

Highway projects are paid for with a mix of local property taxes, the state transportation fund, and federal transportation funds. To cover the costs of upgrading class two town highways to accommodate 80,000-pound vehicles, the average municipal tax rate would increase by six cents per 100 dollars of assessed value, or 22%. Given the variation in miles of class two town highways, number of structures and tax bases throughout the state, cost impacts vary significantly. The state gasoline and diesel taxes would need to increase by seventeen and twenty cents respectively to cover the state's share of the costs. Because federal funding is determined by formula, the State does not have the ability to raise additional federal funds. Therefore, the annual federal cost share of \$8.5 million would have to be diverted from other projects and programs.

Although there are some challenges to administering local overweight permits, municipalities expressed a desire to maintain control over where and when trucks can travel, especially during mud season, and to avoid residential or other activity areas that are more sensitive to trucks. The Department of Motor Vehicles is currently developing an online permitting system that will provide

24-hour-a-day access to apply for, obtain, and pay for required weight and length permits issued by the Vermont Agency of Transportation. The online system will include the municipal overweight permit in the future and offers the opportunity to address local administrative challenges and improve the service provided to permit applicants.

## 3.0 PERMITS FOR WRECKERS TOWING DISABLED VEHICLES

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### 3.1 Background

Section 26(b)(1) of Act 149 asks the following questions:

*(B) identify any safety or financial implications to infrastructure, including bridges, culverts, pavement, and roadways, if an additional permit or permits are not required when a wrecker, as defined under 23 V.S.A. § 4(76), is towing one or more disabled vehicles and the wrecker and disabled vehicle or vehicles individually do not exceed the limitations imposed by 23 V.S.A. chapter 13, subchapter 15, article 1 or are lawfully operating under a blanket permit;*

*(C) make recommendations on any limitations, including distance towed, or conditions that should be imposed if an additional permit or permits are not required in the situation identified in subdivision (B) of this subdivision (1).*

Sections 26(b)(1)(B) and (C) are related to the situation that occurs when the combined size or weight of a wrecker towing a disabled vehicle exceeds statutory size or weight limits in 23 VSA §§ 1391-1398. When the combined size or weight limits are exceeded for a wrecker in combination with a disabled vehicle it is towing, they can travel without an oversize/overweight permit only to the nearest location where the disabled vehicle can be safely parked. Before moving to a repair destination, the tractor and trailer components of a disabled vehicle could be disconnected and towed separately without a permit if the combined size or weight of the individual components and the wrecker does not exceed the limits. In some cases, weight limits may be satisfied if freight in the disabled vehicle is removed. If none of these approaches results in an acceptable weight or size, an oversize or overweight permit is required before the disabled vehicle or its components can be moved to a final repair destination.

Act 149 (2020) amended 23 VSA §1399 to include heavy-duty tow and recovery vehicles operating on the interstate on the list of exceptions to the weight limits in §§ 1391-1398. However, once off the interstate, if the combined weight or size of a wrecker and the vehicle it is towing exceeds weight or size limits, the disabled vehicle would still need to be parked at a safe location until it can be broken down into its components or a permit is acquired for the final move to a repair destination.

The question asks the Agency to identify the safety and financial implications if a blanket permit, with certain conditions was provided that allowed wreckers to move a disabled vehicle directly to its final repair destination. The question also asks for recommendations on any limitations such as distance traveled and other conditions that would be required in the blanket permit.

### 3.2 Financial and Safety Risks

The location and frequency of events that require a wrecker to recover a large disabled vehicle are random as are the routes they would follow to the repair destination. Given this level of uncertainty, the financial and safety implications are considered from a broader risk perspective.

The purpose of the oversize and overweight permit is to allow the movement of heavier and larger loads to accommodate a practical need for the goods or equipment being transported while minimizing the risk to public safety and damage to highway infrastructure. Under normal conditions, the permit is applied for in advance of a trip allowing the Department of Motor Vehicles and the Agency of Transportation to mitigate the risk by identifying routes that can accommodate the move safely with minimal damage to roads and bridges, and to require other conditions that enhance safety during the move.

When identifying lower risks routes for overweight loads, the Agency considers the general condition, design load rating and whether weight restrictions have been posted on bridges. Based on the most recent condition inventory conducted by the Agency of Transportation, the chance that an overweight wrecker towing a disabled vehicle will encounter a large or short structure in poor condition today on an interstate or non-interstate highway is between 1% and 5% (Table 6). However, the condition of bridges will vary over time and the range has been as large as 7% to 18% in the last ten years. To meet Federal requirements, the Agency is required to keep the percentage of structures on the interstate in poor condition below 6%. The Agency established target for non-interstate bridges is 10%. Therefore, the chance that a wrecker towing a disabled vehicle will encounter a bridge in poor condition could be as high as 10% in the future, or perhaps higher if the Agency is unable to meet performance targets.

Table 6: Percentage of Structures in Poor Condition 2008 and 2018

Structure Type	Interstate		Non-Interstate, State Owned	
	2008	2018	2008	2018
Long Structures ( <i>span greater than 20 feet</i> )	7%	2%	18%	4%
Short Structures ( <i>6-20 feet span</i> )	18%	1%	13%	5%

The normal oversize/overweight permit review process redirects trips away from weight restricted bridges and temporary bridges. The number and locations of weight-restricted and temporary bridges will also change each year. There are currently three bridges on the state system that have load restrictions, and four locations with temporary bridges.

Relative to safety, the Agency considers the geometric and alignment characteristics of road segments and bridges that could increase the potential for a crash by causing an oversize vehicle to encroach into an opposing lane, that could result in abrupt and unexpected changes to traffic flow, or that create an obstacle that completely blocks the move. The characteristics include vertical clearance, narrow travel lane and shoulder widths, tight radii or skewed approaches at intersections, and sharp curves and steep grades on road segments (Figure 2). According to the Federal Highway Administration, almost 30% of all work zone crashes involve large trucks (Figure 3). Therefore, it is critical to consider whether oversize vehicles can safely travel through highway project work zones, the locations of which constantly change.

Based on 2018 bridge inspections, 30.4% of interstate long structures and 11.7% of state-owned long structures off the interstate are functionally obsolete. Among other factors, a functionally obsolete bridge may have alignment or width characteristics that create challenges to safely moving an oversize vehicle. Therefore, without the benefit of an evaluation of bridges along a specific route, there is a 12% to 30% chance that an oversize load on a random route will encounter a physical restriction. Other non-bridge locations along the highway system with limited width, height or other geometric constraints that impact safety exist and are arguably common. A comprehensive inventory is not available to quantify the encounter probability of a random trip with these types of constraints, which further underscores the need to review specific routes through the permitting process.



Figure 2: Oversize Load Encroaching into Opposing Lane and Shoulder<sup>1</sup>



Figure 3: Tractor Trailer Moving on a Shoulder Through a Work Zone<sup>2</sup>



In addition to identifying the lowest risk routes for oversize and overweight vehicles, the permit provides an opportunity for DMV and the Agency to include conditions to further reduce risk such as limitation on time of day and weather, and requirements for escort vehicles with appropriate warning devices.

Safety and traffic flow concerns often result at locations where a large vehicle becomes disabled. In this situation, it is necessary to move the vehicle as soon as practical and there is not enough time to submit an oversize/overweight permit application and evaluate potential routes to a repair destination. Tow truck operators do not usually have advanced warning or specific details about the disabled vehicle until they arrive on the scene. Potential impacts of the move on safety and highway infrastructure are minimized by requiring the disabled vehicle to be stored at the nearest safe location. DMV or other law enforcement officers at the scene have flexibility to allow the tow

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<sup>1</sup> Truck Network Analysis, Vehicle Related Criteria, Prepared by VHB for the Vermont Agency of Transportation, 1999.

<sup>2</sup> Trucking Safety Through Work Zones, FHWA, <https://safety.fhwa.dot.gov/wz/resources/fhwas03010/fhwas03010.pdf>

operator to move the disabled vehicle directly to a repair destination if it is reasonably close to the disablement location, or for other reasons.

### 3.3 Possible Blanket Permit Conditions

To help identify potential conditions for a blanket permit that would allow a wrecker towing a disabled vehicle to travel directly to a repair location, requirements for similar permits were reviewed in other states. States with these types of permits were identified with assistance from the Vermont Towing Association and through a request sent nationally at the Agency's request by the Eastern Transportation Coalition<sup>1</sup>.

#### States that share a border with Vermont

Whether they do or do not provide a waiver for wreckers towing disabled vehicles, it is useful to consider the requirements with Vermont's three bordering states.

**Massachusetts:** Exceptions to weight or size limits are not available to wreckers towing a disabled vehicle. Like Vermont, if it is not practical to break down the disabled vehicle at the location of its disablement, it must be moved to a safe location. An oversize or overweight permit is then required for the final move to the repair destination<sup>2</sup>.

**New Hampshire:** New Hampshire law is specific that the statutory weight limits do not apply to damaged, disabled, or abandoned vehicles being towed by a tow truck for a reasonable distance to the nearest safe haven off the highway where the weight of each such individual unit does not exceed the maximum legal or permitted weight for the unit. Like Vermont, an oversize or overweight permit is then required to move the disabled vehicle from the safe haven to the repair destination if it cannot be broken down into components that do not exceed weight or size limits (N.H. Rev. Stat. Ann. §266:21-a).

**New York:** NYS Vehicle and Traffic Law provides an exception to the state's overall length limit, which allows a vehicle to be towed 10 miles or to the nearest exit of a controlled access highway without needing a permit for length. The NYS Vehicle and Traffic Law also waives the need for an overweight permit if the vehicle being towed is not heavier than the tow truck itself. If the weight of the towed vehicle exceeds the tow truck, or the combination is over-width or over-height, a permit would be needed. The blanket permit has the following specific conditions:

- 40 feet maximum length for the tow truck
- Minimum wheelbase of towing vehicle is 16 feet
- Up to 125% of weight limits (equates to 100,000 pounds)
- Maximum Single Axle Weight: 25,000 pounds
- Maximum Tandem Axle Weight: 47,000 pounds
- Maximum Tridem Axle Weight: 57,000 pounds

According to NYSDOT, some towing companies have noted that the permit does not allow for enough weight if the company must tow a loaded truck. Companies are acquiring the permit though, as it does offer some coverage<sup>3</sup>.

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<sup>1</sup> The Vermont Agency of Transportation is a member of the Eastern Transportation Coalition, a partnership of 17 states and D.C. focused on connecting public agencies across state lines and all modes of travel to increase safety and efficiency. <https://tetcoalition.org/>

<sup>2</sup> January 7, 2021, phone call with Jessica Fanning, Oversize/Overweight Permit Program Coordinator, MASS DOT

<sup>3</sup> Emails, January 4, 2021 and January 8, 2021. Thomas Golden, NYSDOT Special Hauling Permit Unit

## Other States

**Connecticut:** Connecticut created an annual blanket permit in early 2020 that allows a wrecker to tow or haul a motor vehicle in excess of the axle limits, gross vehicle weight limits, or the federal bridge formula , (1) from any highway, (2) if such vehicle was involved in an accident, (3) if such vehicle became disabled and remains where such vehicle became disabled, or (4) if such vehicle is being towed or hauled by order of a traffic or law enforcement authority. Trip distance is not restricted. A wrecker can tow a disabled vehicle to the nearest repair facility. The permit includes a list of restricted bridges that a wrecker is not allowed to cross. An additional single-trip permit is required for weights greater than 160,000 pounds, and in excess of an axle, gross combination vehicle weight or federal bridge formula requirements for vehicles with divisible or non-divisible loads. The blanket permit is not available for oversize vehicles. (Conn. Gen. Stat. Ann. [§14-262a](#)).

**Florida:** While moving a disabled vehicle, tow trucks or wreckers will not be penalized for exceeding State weight limits (Fla. Stat. Ann. §316.530[3]). The Department of Transportation may issue a special blanket permit to authorize a wrecker to tow a disabled vehicle where the combination exceeds State weight limits and must supply a map showing the routes on which the wrecker may safely tow disabled vehicles for all special permit classifications for which the wrecker applies. There is no maximum towing distance, the maximum gross vehicle weight is 140,000 pounds, and the maximum axle load is 45,000 pounds on a tandem (Fla. Stat. Ann. §316.550[5]).

**Maine:** If a wrecker meets the definition of a "heavy duty recovery vehicle" it does not need a permit when towing a disabled vehicle to its repair location<sup>1</sup>. Travel distance is not restricted. A "Heavy duty recovery vehicle" is defined as a wrecker that is designed for the specific purpose of recovering vehicles that have a gross, combined or actual weight of more than 80,000 pounds; has either 4 or 5 axles; has a manufacturer's gross vehicle weight of 70,000 pounds or more; is equipped with a recovery boom that is rated for 70,000 pounds or more; is equipped with an air brake system capable of providing compressed air to the braking or suspension system of a vehicle being towed by the heavy duty recovery vehicle; and is capable of towing a combination vehicle with a gross weight of more than 99,000 pounds<sup>2</sup>.

**Maryland:** If the wrecker and disabled vehicle are of legal weight when not in tow, they would not be in violation of oversize or overweight limits while being towed. For heavy duty wreckers that individually exceed weight limits to travel in Maryland they must obtain a hauling permit. This places Maryland registered tow trucks in compliance with Maryland's tow truck registration requirement to be of legal weight. Maryland does not have a distance limitation but does require the safest and shortest practical route possible to the vehicle's destination. Maryland will issue a hauling permit for weight for a heavy-duty wrecker when the weight would exceed any limits of the federal bridge formula by itself (such as a mobile crane). The permit would not cover the wrecker for weight when towing another vehicle. (TA13-920.e)

**Montana:** If it is not possible to separate a tractor and trailer combination at the disablement location, the wrecker-disabled vehicle combination may travel from the emergency scene or place of disablement on a public roadway to the operator's place of business or yard or suitable secure facility if it is within 100 miles of the emergency scene. If a move exceeds 100 miles, the disabled vehicles may be removed from the emergency scene or place of disablement on a public roadway but must be separated at the first place where the combination can be safely reduced to a single unit. (State of Montana Rule: 18.8.519 – Wreckers and/or Tow Vehicle Requirements).

**New Jersey:** State weight limits do not apply to vehicles or combinations of vehicles that are disabled and being removed from a highway in the State, provided that the vehicle combination does not travel more than 75 miles on public highways from where the disablement occurred. In addition, a

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<sup>1</sup> December 30, 2020 email, Patricia M. Cordon Chacon, Maine Bureau of Motor Vehicles- Overlimit Permit Unit

<sup>2</sup> <https://legislature.maine.gov/legis/statutes/29-A/title29-Asec101.html>

heavy-duty tow truck is permitted, in combination with the towed unit or units, to exceed the axle, dimensional, and maximum gross weight limits for tow trucks and towed unit combinations, except that the limit may not exceed 150,000 lbs. gross combined weight (N.J. Stat. Ann. §39:3-84[c]).

**North Carolina:** According to NC GS 20-116, NC does allow the tractor trailer to be towed while still being combined only to a place of repair, parking, or storage within 50 miles of the point where the vehicle was disabled. This law applies when the vehicle is disabled at an unsafe location. The towing vehicle must have a NCDOT permit for the overweight. The permit will allow 20,000lbs. on the steer axle, 25,000lbs. on a single axle, 50,000lbs. on a tandem and 68,000lbs. on four or more axles. Overall gross weight on the permit would be determined by NCDOT based on the specifications of the towing unit. (NC GS 20-116).

## Blanket Permit Condition Options

Distanced traveled from where the disablement occurs to a repair or safe parking location range from 10 to 100 miles. Based on the size of the state, a 75-mile limit may be appropriate for Vermont (Table 7).

Table 7: State Size and Towing Distance Comparison

State	Square Miles	Towing Distance Allowed (miles)
New Jersey	8,722	75
Vermont	9,623	Not Applicable
North Carolina	52,627	50
New York	54,457	20
Montana	147,046	100

Special weight limits specified include no limit, and maximum gross vehicle weights of 100,000, 145,000, 150,000 and 160,000 pounds. There are also various limits for the steer, rear, and tandem axles.

The tow vehicle should weigh more than the disabled vehicle.

The individual weights of the tow truck and the disabled vehicle cannot exceed statutory weight limits.

Include in the permit a list of restricted bridges that cannot be crossed.

Limit blanket permits to overweight vehicles. Do not provide blanket permit for oversize vehicles. Structures are designed with factors of safety that can accommodate some variation in the loads they can accommodate. However, there are no factors of safety for height limits.

## 3.4 Summary

Allowing a wrecker to tow a vehicle from a disablement location to a final repair destination without a permit when their combined weight or size exceeds statutory limits creates infrastructure damage and safety risks that would otherwise be mitigated through the oversize/overweight permitting process.

The chance that a wrecker towing a disabled vehicle will encounter a large or short span bridge in poor condition today on an interstate or non-interstate state highway in Vermont is 1% and 5% respectively. This chance could be as high as 10% in the future, or perhaps higher if the Agency is unable to meet its bridge and pavement infrastructure condition performance targets.

Safety risks are created when an oversize vehicle travels through locations with non-standard highway geometry and alignment characteristics that may require encroaching into an opposing lane, abrupt and unexpected changes to traffic flow, or that create an obstacle that blocks the move. There is a 12% to 30% chance that an oversize load will encounter a physical restriction at a bridge, such as limited width or a challenging approach alignment. Other non-bridge locations along the highway system with limited width, height or other geometric constraints that may impact safety exist and are arguably common and likely to be encountered when a wrecker moves a disabled vehicle.

Of the three bordering states, New Hampshire and Massachusetts have similar requirements to Vermont and only allow a wrecker towing a disabled vehicle to travel to the nearest safe location without an oversize or overweight permit when their combine weight or size exceeds limits. New York State offers a blanket permit that restricts the travel distance to 10 miles without a permit if the combined weight of the wrecker and disabled vehicle is less than 100,000 pounds, certain axle loads limitations are satisfied, the wrecker is less than 40 feet long and other specific requirements.

Based on review of other states, the following conditions should be considered in a blanket permit if one was available in Vermont:

- Distanced traveled from where the disablement occurs to a repair or safe parking location range from 10 to 100 miles. Based on the size of the state, a 75-mile limit may be appropriate for Vermont.
- Special weight limits specified include no limit, and maximum gross vehicle weights of 100,000, 145,000, 150,000 and 160,000 pounds. There are also various limits for the steer, rear, and tandem axles.
- The tow vehicle should weigh more than the disabled vehicle and its length should not exceed 40 feet.
- The individual weights of the tow truck and the disabled vehicle cannot exceed statutory weight limits.
- Include in the permit a list of restricted bridges that cannot be crossed.
- Limit blanket permits to overweight vehicles. Do not provide blanket permit for oversize vehicles. Structures are designed with factors of safety that can accommodate some variation in the loads they can accommodate. However, there are no factors of safety for height limits.

## 4.0 US ROUTE 4 OVERLENGTH PERMIT

### 4.1 Background

Section 26(b)(1)(D) of Act 149 (2020) asks the following question:

*(I) identify any safety or financial implications to infrastructure, including bridges, culverts, pavement, and roadways, if 23 V.S.A. § 1432(c) is repealed.*

Pursuant to 23 VSA § 1432(a)(1) a vehicle with a trailer or semitrailer with an overall length of 75 feet or less can operate on Vermont highways without an overlength permit from DMV. However, 23 VSA §1432(c), the subject of the question addressed in this section of the report, requires a special overlength permit for vehicles with a trailer or semitrailer which are longer than 68 feet but not longer than 75 feet on US 4 between the New Hampshire border and VT 100 South in Bridgewater. For this report, the permit is referred to as the US 4 Overlength Permit. If 23 VSA §1432(c) is repealed, the US 4 Overlength Permit would be eliminated. Vehicles with a trailer and semi-trailer with a length up to 75 feet would be allowed to travel on that section of US 4 without a special permit like all other highways in the State. Figure 4 shows one of several signs throughout the corridor that posts the requirement for the US 4 Overlength Permit.

Figure 4: US 4 Westbound, Just west of I-89



Prior to 2000, no motor vehicle with or without a trailer or semi-trailer longer than 65 feet could operate upon any State highway without an overlength permit. The requirement for the US 4 Overlength Permit was first established in changes to 23 VSA § 1432 enacted in Act 154 of 2000. A special permit was required for vehicles with a trailer or semi-trailer with lengths between 68 and 72 feet. Section 1432 was also amended by Act 154 to create the Vermont Truck Network (Figure 5). The maximum length for vehicles with a trailer or semi-trailer allowed on the Truck Network without a permit was set at 72 feet. An oversize permit was required to operate on any road off the Truck Network for lengths greater than 68 feet. The section of US 4 between the NH Border and VT 100-South was the only section of highway identified on the Truck Network map where a permit was required for lengths between 68 and 72 feet. The Truck Network was eliminated in changes to 23 VSA § 1423 enacted in Act 50 of 2009. The changes also increased the maximum length to 75 feet for the operation on all highways without an oversize permit, except for US 4 between NH and VT 100-South. Section 1432(c) was amended by Act 164 of 2012 to change the upper value of the US 4 Overlength Permit from 72 feet to 75 feet. There have been no modifications to 24 VSA § 1432(c) since 2012.

The US 4 Overlength Permit is available from the DMV. The permit is free, can include multiple vehicles, and cover single or multiple trips. The permit must be carried on the designated vehicles that are traveling on that section of US 4. The DMV's standard overlength permit is required if the

length exceeds 75 feet. On average, the DMV issued 855 US 4 Overlength Permits per year since 2014 (Table 8).

Table 8: US 4 Foot Overlength Permits Issued by the VT DMV

State Fiscal Year	Permits Issued
2014-15	985
2015-16	1,106
2016-17	762
2017-18	674
2018-19	744
2019-20	861
<b>Average</b>	<b>855</b>

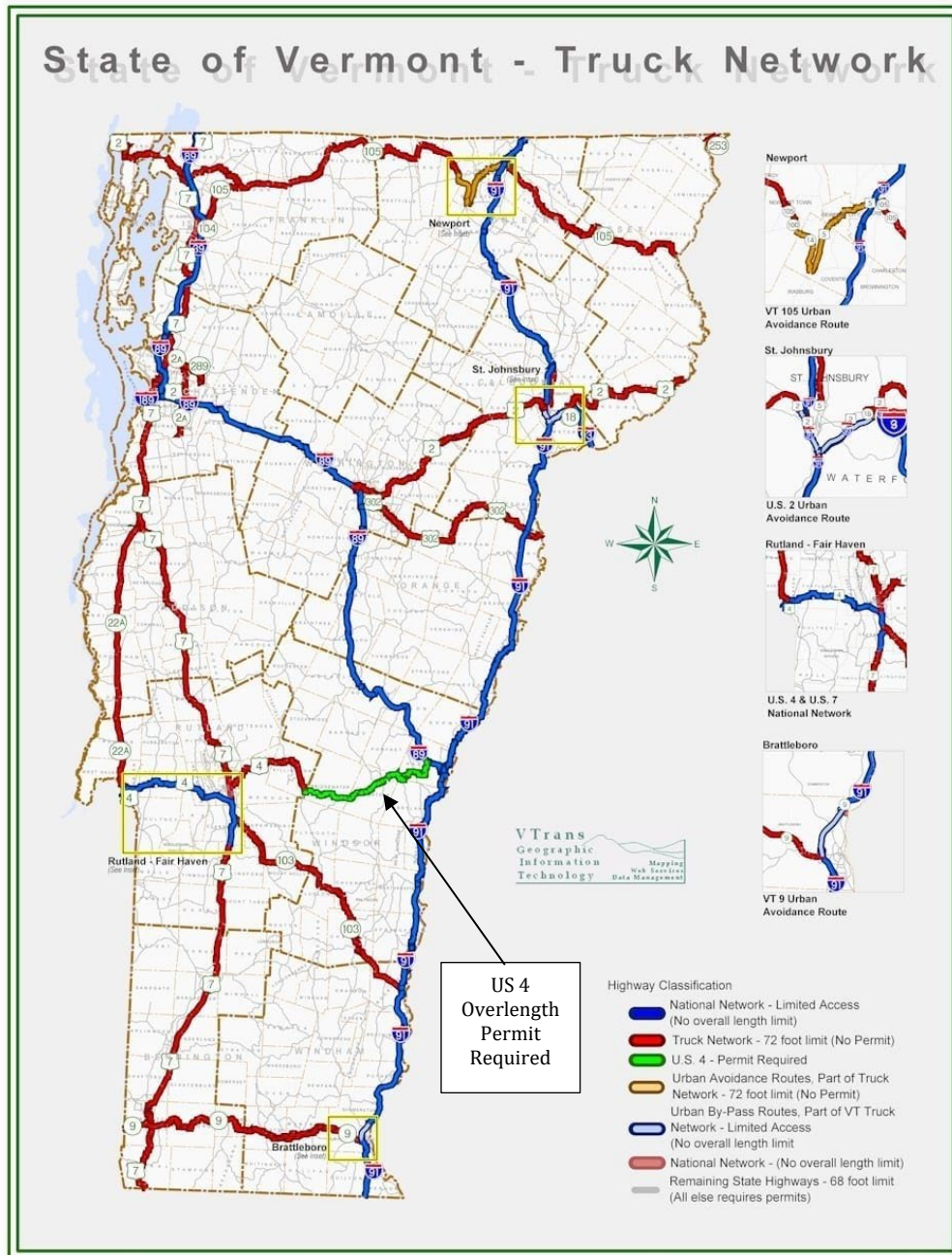
The Department of Motor Vehicles has not issued any permit violations in recent years. The Town of Woodstock issues tickets to truck operators that are in violation of the US 4 Overlength Permit. Between 2016 and 2019, the Town issued an average of 125 tickets per year. The fines are \$392 for first offense, \$737 for the second offense and \$967 for the third offense.

### **Characteristics of US 4 from New Hampshire to VT 100 South in Bridgewater**

This stretch of US 4 is 27.1 miles long and passes through the towns of Hartford (9.8 miles), Hartland (0.8 miles), Woodstock (9.0 miles) and Bridgewater (7.5 miles). It is a rural two-lane highway that passes through a variety of land use types including an urban area in White River Junction, a larger village in Woodstock, and smaller villages and activity areas at Quechee Gorge, Taftsville, and Bridgewater. US 4 from New Hampshire to New York is classified as a principal arterial which means its function is to provide mobility for longer distance trips. It is also designated as part of the National Highway System (NHS), which includes the interstate system and other principal arterials that are important to the nation’s economy, defense, and mobility. Like the other principal arterials in Vermont (VT 9, VT 103, US 2, and US 7), the overall purpose of US 4 to accommodate long distance trips at higher speeds creates challenges when it passes through cities, villages, and other activity centers where there are more pedestrians and bicyclists, more driveways and local street intersections, on-street parking, and often narrower lanes.

The posted speed limit along the rural sections outside of the urban, village and activity areas is 45 MPH from I-89 to VT 100A, and 50 MPH from VT 100A to VT 100-South. The posted speeds transition to 35 MPH in Quechee Gorge, Taftsville and Bridgewater Village, and 25 MPH in Woodstock Village. There is one lane in each direction throughout this section of US 4. Travel lane widths are generally 12 feet wide and shoulders vary between two to four feet between US 5 and VT 100A and, four to six feet between VT 100A to VT 100-South. There are sidewalks and marked crosswalks in White River Junction, Quechee and Woodstock but none in Taftsville or Bridgewater. This section of US 4 follows closely to the Ottauquechee River and there are no significant hills. See Appendix C for photos of the corridor.

Figure 5: VT Truck Network as Designated by the General Assembly in 2000 and Repealed in 2009



## 4.2 Analysis

This section presents an analysis of truck travel through the corridor and the financial implications related to changes in truck travel. It also includes a review of crash data along the study area and considers the potential safety consequences if the US 4 Overlength Permit was repealed.



## Truck Travel Changes and Financial Implications

Based on vehicle classification counts conducted by VTrans, there are approximately 191 tractor trailers traveling on US 4 between I-89 and VT 100-South on an average day (Table 9). The number of tractor trailers decreased by approximately 41 trips per day after the US 4 Overlength Permit went into effect in 2000.

Table 9: Tractor Trailer Counts on US 4 Between NH and VT 100-South

Count Station	Town	General Location	Number of Tractor Trailers per Day		
			Before 2000	After 2000	Difference
Y117	Bridgewater	Just east of VT 100-South	203	166	-37
Y113	Bridgewater	Approx 1/2 way between VT 100-South and VT 100A	252	179	-72
Y116	Woodstock	Approx 1/2 mile west of Woodstock Village	231	214	-17
Y118	Hartford	2 miles east of Woodstock TL, west of I-89	240	203	-37
<b>Average</b>			231	191	-41

Compared to other similar routes in VT, the number of tractor trailers on this section of US 4, even before 2000, is not unusual and somewhat lower than average (Table 10). If the purpose of the US 4 Overlength Permit is to divert truck trips to other routes, it appears to have succeeded to some extent, although tractor trailers continue to travel on that section of US 4 at volumes consistent, although somewhat lower than, other similar routes.

Table 10: Tractor Trailer Counts on Similar Routes

Route	Station	Town	Year	Tractor Trailers per Day
VT 9	X133	WILMINGTON	2018	266
VT 103	X111	ROCKINGHAM	2018	314
	Y062	LUDLOW	2016	268
	Y192	CHESTER	2019	311
US 302	N147	NEWBURY	2018	138
US 2	C110	DANVILLE	2016	183
	W103	PLAINFIELD	2015	176
	G119	ALBURGH	2017	267
VT 105	F116	SHELDON	2014	236
	F118	ENOSBURGH	2015	113
US 7	R107	WALLINGFORD	2017	138
	R176	PITTSFORD	2015	240
	R427	BRANDON	2015	294
	A011	MIDDLEBURY	2015	276
	D277	SHELBURNE	2018	631
VT 22A	A195	VERGENNES	2014	432
Average				268

The Statewide Travel Demand Model (TDM) was used to identify alternate routes to US 4 for operators of trucks that may be avoiding the permit. The TDM is maintained by the University of Vermont Transportation Research Center under a cooperative agreement with VTrans. The analysis and results are described in the memo from UVM in Appendix D. The TDM is a computer model that simulates daily traffic flows, including truck trips, on the entire state highway system and major local roads. It is used to estimate traffic flows related to the location of households and employment and the characteristics of the highway system such as the addition of new roadways, adding lanes to existing facilities, and changing speed limits. The model does not have the ability to measure the specific effect of eliminating the US 4 Overlength Permit. Rather, all truck trips were prevented from using the section from US 4 between the New Hampshire border and VT 100-South. While this

modelling approach significantly overstates the impact of the permit in terms of number of truck trips diverted, it is a reasonable means to identify the most attractive alternate routes. The results indicate that the most attractive alternative routes to US 4 are I-89, VT-107, and VT-100 between Hartford and Killington to the north, and I-91, VT-12, VT-106, and series of local roads to the south.

Operators of trucks traveling on US 4 do so because it provides the shortest and most efficient connection between their origin and destination. Therefore, if the operator of a truck that would normally choose to travel on US 4 decides to use another route to avoid the inconvenience of acquiring a permit, the trip will be longer. Based on output from the Statewide Transportation Demand Model, trucks diverted from US 4 will increase the length of their trip by an average of 5.4 miles. When applied to the observed decrease of 41 truck trips per day on US 4 after the Overlength Permit was established in 2000, and extrapolated for an entire year, the result is an annual increase of approximately 81,200 truck miles of travel on all highways (Table 11).

Table 11: Estimated Change in Systemwide Truck Miles of Travel of Trucks Diverted from US 4

Average Increase in length of a diverted truck trip (miles per trip)	5.4
Reduction in Actual Daily Truck Trips after 2000	41
Increase in Daily Truck Miles of Travel	222
Increase in Annual Truck Miles of Travel	81,178

Each truck mile of travel results in pavement and bridge maintenance costs of \$0.39 per mile. This unit cost is based on the cost responsibility tables for trucks with total lengths between 68 feet and 75 feet from the *Weight-Based Annual Registration Report*, a Legislative Study completed by VTrans in December 2019<sup>1</sup>. The resulting net cost increase to the State is between \$27,381 and \$31,670 per year depending on how much of a truck's diesel fuel (and related diesel fuel tax) was purchased in Vermont (Table 12).

Table 12: Impact of Diverted Trucks on Pavement and Bridge Maintenance Costs

Increase in Annual Truck Miles of Travel	81,178
Pavement and Bridge Maintenance Cost per Mile for trucks between 68 and 75 feet of length	\$0.39
Total Annual Cost of Diverted Trips	\$31,670
Gallons of Diesel Costumed (5.3 miles per gallon)	15,317
State Diesel Tax Paid (\$0.28/Gallon) <sup>2</sup>	4,289
Net Cost to State Assuming Fuel Purchased in State	\$27,381

Additional external costs that result from increased truck miles include congestion, crashes, noise, air pollution, and greenhouse gas emission and are estimated to add 12.6 cents per truck mile of travel (Table 13). These externalities are dispersed and are absorbed in various local and state public agency budget line items and by individuals.

<sup>1</sup> Vehicle Class 3S2, CS5, and CT5, Table 3.17.

<sup>2</sup> The total diesel tax is 32 cents per gallon. 28 cents per gallon goes to the Transportation Fund and is available for highway projects.

Table 13: External Costs per Mile of Truck Travel

External Cost Type	Cents per mile <sup>1,2</sup>	Year	Adjustment to 2020	2020 Cost per Mile
Congestion	3.7	1997	1.06	3.9
Crashes	2.2	1997	1.06	2.3
Noise	0.26	1997	1.06	0.3
Air Pollution	3.85	1997	1.06	4.1
Green House Gas	1.97	2020	1.00	2.0
Total Cost per Mile of Truck Travel (Cents)				12.6
Additional Annual Miles of Truck Travel Diverted from US 4				81,178
<b>Total Annual External Costs</b>				<b>\$10,209</b>

The combined annual total cost of diverting trucks from US 4 is estimated between \$36,977 and \$41,878 depending on how much diesel gas (and related diesel tax) is purchased in Vermont (Table 14).

Table 14: Total Annual Costs of Trucks Diverted from US 4

Cost Category	Diverted Trucks Purchase All Diesel Fuel in VT	Diverted Trucks Purchase No Diesel Fuel in VT
Highway Maintenance Costs	\$27,381	\$31,670
External Societal Costs	\$10,209	\$10,209
<b>Total</b>	<b>\$37,590</b>	<b>\$41,878</b>

## Safety

From 2010 to 2019, there were 30 crashes involving tractor trailers on US 4 from NH to VT 100 South. Details of each crash are provided in Appendix E. The total crash rate on this section of US 4 (number of tractor trailer crashes per million truck miles of travel) is significantly lower than the total national tractor trailer crash rate, property damage only crashes, and crashes involving injuries (Table 15).

There was one tractor trailer crash on US 4 during this ten-year period that resulted in a fatality. Given the relatively low number of truck trips in Vermont in general, and along the US 4 corridor specifically, even a single fatality results in a fatality crash rate that in this case is higher than the national average. The fatality occurred in Hartford, just east of the Hartland town line in May 2013. The driver of an eastbound vehicle failed to negotiate a right curve in the road, crossed into the opposing lane and crashed into an oncoming tractor trailer head-on. Centerline rumble stripes, which are a proven method that will help drivers stay in their lane, were installed in 2014 between Woodstock Village and the US 4 intersection with US 5 in White River Junction.

<sup>1</sup> Congestion, Crashes, Noise and Air Pollution Costs from the [1997 Federal Highway Cost Allocation Study Final Report, U.S. Department of Transportation, Federal Highway Administration](#)

<sup>2</sup> See Appendix X for Calculation of Carbon Costs per Mile

Table 15: 2010-2019 Tractor Trailer Crashes on US 4, NH to VT 100-South

Description	Crash Type			Total
	Property Damage Only	Injury	Fatal	
Number of Crashes 2010-2019 on US 4 Hartford to VT 100-South	23	6	1	30
Average Crashes per Year on US 4 Hartford to VT 100-South	2.3	0.6	0.1	3.0
Crashes per 1 Million Truck Miles of Travel on US 4 Hartford to VT 100-South	1.26	0.33	0.05	1.64
National Tractor Trailer Crash Rates <sup>1</sup>	2.28	0.61	0.03	2.92

Repeal of the US 4 Overlength Permit would reduce the number of truck trips that currently divert from US 4 to other roads to avoid acquiring a permit. The result would be a total decrease in truck miles of travel on all state roads and an increase of about 41 tractor trailer trips per day on US 4. From the statewide perspective, less truck miles of travel should result in a net decrease in tractor trailer related crashes. Since there will be more trucks traveling on US 4, the potential for tractor trailer crashes would increase along that corridor. However, as shown in Table 15 the ratio of tractor trailer crashes to truck miles of travel is significantly lower than the national averages for total crashes, crashes resulting in an injury, and property damage only crashes. This comparison suggests that US 4 is not particularly unsafe and should be able to safely accommodate an increase in the number of truck trips. Lane and shoulder widths are consistent with state standards and the predominant speed limit of 45 miles per hour is less than the 50 MPH speed on other similar highways in the state. Furthermore, highway projects completed since the Overlength Permit was created in 2000 have helped improve safety along this section of US 4 including centerline rumble stripes, sidewalks, installation of a left turn lane where sight distance is restricted at the Lincoln Covered Bridge, and installation of radar speed feedback signs.

Tractor trailer crashes were dispersed at twenty-two locations throughout the corridor, with six locations experiencing two or three crashes during the 10-year time frame. Three of these locations are in Woodstock Village between College Hill Road and the Green (2-crashes), at the intersection with VT-12 (Elm Street, 3 crashes), and at the intersection with Hartland Hill Road (3 crashes). All the tractor trailer crashes in Woodstock Village, including one each at High Street and Eaton Place, were property damage only with no injuries or fatalities resulting. The crashes at College Hill Road and the Green and at the VT 12 intersection had a variety of causes without a clear pattern and none of which were related to deficiencies in the roadway design. All three crashes at the Hartland Hill intersection occurred when a westbound tractor trailer drove over the adjacent curb while turning right onto Pleasant Street.

In 2018, the Two-Rivers Ottauquechee Regional Planning Commission hired Resource Systems Group (RSG), a transportation planning and engineering consulting firm, to document issues with tractor trailers traveling on US 4 at the Hartland Hill intersection, the west end of the Green, and the River Street intersection<sup>2</sup>. Using video, the study documented that of the 34 westbound trucks observed that day turning right through the intersection, 53% encroached on the opposing lane. The RSG study also found that 48% of westbound trucks encroached into the opposing lane after exiting the west end of the Green, and 19% at the River Street intersection. Despite the frequencies of the

<sup>1</sup> [Analysis Division, Federal Motor Carrier Safety Administration; Large Truck and Bus Crash Facts 2018; FMCSA-RRA-19-018; September 2020](#)

<sup>2</sup> Memorandum from Corey Mack, RSG Transportation Engineer to Rita Seto, Two Rivers Ottauquechee RPC

opposing lane encroachments, there were no reported crashes involving trucks that cross the centerline in Woodstock Village between 2010 and 2019.

The other three locations along this section of US 4 experienced two tractor trailer crashes in the ten-year time-period and are located in Hartford at the intersection with Deweys Mill Road at Quechee Gorge, the Route 4 Country Store (approximately 0.6 miles west of I-89), and at the I-89 Exit 1 northbound exit ramp. One crash at Quechee Gorge resulted in an injury when a tractor trailer was not able to slow down in time to avoid a rear end collision with a vehicle waiting to turn into a gift shop. Another injury occurred at the Exit 1 off-ramp due to a mechanical failure of the brakes that prevented the vehicle from stopping at the end of the ramp and resulted in a collision with a tractor trailer on US 4.

Of the 30 crashes that occurred along this section of US 4 between 2010 and 2019, ten were in Woodstock Village. The crashes resulted in property damage but no injuries or fatalities. It is common for crash frequencies to increase in areas with more roadside activities, such as Quechee Gorge and Woodstock Village. However, the situation where an arterial highway passes through denser activity areas is not unique to the US 4 corridor or particularly acute there. The intersection of US 4 with Hartland Hill Road in Woodstock Village is the one location with a consistent crash pattern that is directly related to tractor trailers. Crashes at the US 4-Hartland Hill Road intersection could be reduced with changes to its design.

### 4.3 Summary

This section analyzes the safety and financial implications to highway infrastructure if the unique overlength permit required along US 4 from the New Hampshire border, through Hartford, Hartland, and Woodstock to VT Route 100-South in Bridgewater is repealed. The US 4 Overlength Permit requires a permit from the VT Department of Motor Vehicles for vehicles that are between 68 to 75 feet long. For all other state highways, an overlength permit is not required for vehicles up to 75 feet long.

The Overlength Permit causes some tractor trailer operators to avoid US 4. There are approximately 191 tractors trailers traveling on US 4 between I-89 and VT 100-South on an average day. The number of tractor trailers decreased by approximately 41 trips per day after the US 4 Overlength Permit went into effect in 2000. Compared to other similar routes in VT, the number of tractor trailers on this section of US 4, even before 2000, is not unusual and somewhat lower than average.

Truck operators that avoid US 4 increase their trip lengths by an estimated average of 5.4 miles resulting in an annual increase of approximately 81,200 truck miles of travel on all state and local highways. The resulting net increase in pavement and bridge maintenance costs due to these extra truck miles is between \$27,381 and \$31,670 per year depending on how much of a truck's diesel fuel (and related diesel fuel tax) is purchased in Vermont. If the permit is repealed, these costs could be avoided. Additional external costs savings of \$10,809 per year would accrue to individuals and public agencies due to the avoided costs of congestion, crashes, noise, air pollution, and greenhouse gas emissions created by the miles traveled by diverted trucks.

From 2010 to 2019, there were 30 crashes involving tractor trailers on US 4 from NH to VT 100-South. The ratio of tractor trailer crashes to truck miles of travel is significantly lower than the national averages for total crashes, crashes resulting in an injury, and property damage only crashes. One fatality occurred in Hartford in 2013 when the driver crossed into the opposing lane and crashed into an oncoming tractor trailer head-on. Given the relatively low number of truck trips in Vermont in general, and along the US 4 corridor specifically, even a single fatality results in a fatality crash rate that is higher than the national average. Centerline rumble strips were installed in 2014 which have helped reduce the potential for similar collisions since then and will continue to do so into the future. The truck crash rate comparison demonstrates that US 4 is not less safe than other roads and should

be able to safely accommodate the estimated daily increase of 41 truck trips per day that may occur if the permit is repealed.

Of the 30 crashes that occurred between 2010 and 2019 along this section of US 4, ten were in Woodstock Village. The crashes resulted in property damage but no injuries or fatalities. It is common for crash frequencies to increase in areas with more roadside activities, such as Quechee Gorge and Woodstock Village. However, the situation where arterial highways pass through denser activity areas is not unique to the US 4 corridor or particularly acute there. The intersection of US 4 with Hartland Hill Road in Woodstock Village is the one location with a consistent crash pattern that is directly related to tractor trailers. Crashes at the US 4-Hartland Hill Road intersection could be reduced with changes to its design.

*End of Report*

## **Appendix A. Class 2 Town Highway Bridge Analysis**



















Table with columns: TOWN, ROUTE, BRIDGE NUMBER, FUNCTIONAL CLASS, FEATURE INTERSECTED, FACILITY CARRIED, LOCATION, BRIDGE TYPE, BRIDGE STATUS, METHOD OF LOAD RATING, OPERATING LOAD (TONS), INVENTORY OVERS LOAD (TONS), DISTRICT, SPAN LENGTH (FEET), OWNER, YEAR BUILT, YEAR RECONSTRUCTED, AVERAGE DAILY TRAFFIC, AVERAGE DAILY TRUCK TRAFFIC, 1 TRUCK @ 87% TP, 3 TRUCK @ 87% TP, 2 TRUCK @ 87% TP, 4 TRUCK @ 87% TP, 5 TRUCK @ 87% TP, 6 TRUCK @ 87% TP, 7 TRUCK @ 87% TP, COMMENT, POSTED VEHICLE, POSTED VALUE, CONTROLLING MEMBER, DESIGN LOAD, STRUCTURE LENGTH (FT), OUT-OUT DECK WIDTH (FT), APPROACH ROADWAY WIDTH (FT), FULL PROJECT BRIDGE REPLACEMENT COST (\$000 PER S&P/1), FY2029 REPLACEMENT COST PER S&P/1, DECK TYPE







TOWN	ROUTE	BRIDGE NUMBER	FUNCTIONAL CLASS	FEATURE INTERSECTED	FACILITY CARRIED	LOCATION	BRIDGE TYPE	BRIDGE STATUS	METHOD OF LOAD RATING	OPERATING GROSS LOAD (TONS)	INVENTORY GROSS LOAD (TONS)	DISTRICT	BYPASS DEFOUR LENGTH (MILES)	OWNER	YEAR BUILT	YEAR RECONSTRUCTED	AVERAGE DAILY TRUCK TRAFFIC	AVERAGE DAILY TRUCK TRAFFIC	1 TRUCK @ 67% TP	2 AXLE TRUCK @ 67% TP	3 AXLE STRAIGHT TRUCK @ 67% TP	4 AXLE STRAIGHT TRUCK @ 67% TP	5 AXLE SEMI-TRAILER TRUCK @ 67% TP	6 AXLE SEMI-TRAILER TRUCK @ 75% TP	COMMENT	POSTED VEHICLE	POSTED VALUE	CONTROLLING MEMBER	DESIGN LOAD	STRUCTURE LENGTH (FT)	DECK WIDTH (FT)	APPROACH ROADWAY WIDTH (FT)	FULL PROJECT BRIDGE REPLACEMENT COST (\$500 PER SQ.F.T.)	FFY2019 REPLACEMENT COST OF BRIDGES (OFF-INS) (\$288 PER SQ.F.T.)	DECK TYPE
WORCESTER	FAS 0242	00004	07 - MAJOR COLLECTOR (RURAL)	WORCESTER BROOK	TR 01 FAS 242	1.3 MI E ACT. VT.12	CONCRETE SLAB	A - OPEN, NO RESTRICTION	1 - LOAD FACTOR	95	57	8	16	03 - TOWN	2007	---	490	2	155	65	67	110	121		ALL TRUCK RATINGS EXCEED BLDG. LEB.			0 - OTHER OR UNKNOWN	30.0	25.3	24.0	N/A	N/A	1 - CONCRETE (C/P)	
WORCESTER	FAS 0242	00005	07 - MAJOR COLLECTOR (RURAL)	WORCESTER BROOK	TR 01 FAS 242	1.0 MI E ACT. VT. 12	CONCRETE SLAB	A - OPEN, NO RESTRICTION	1 - LOAD FACTOR	66	39	8	16	03 - TOWN	1980	---	490	6	129	24	35	58	63		H15, H10, OR UNKNOWN DESIGN LOAD OF BRIDGE			0 - OTHER OR UNKNOWN	20.0	28.0	24.0	\$277,800	\$233,856	1 - CONCRETE (C/P)	
WORCESTER	FAS 0242	00009	07 - MAJOR COLLECTOR (RURAL)	N. BRANCH WINDSOR RIVER	TR 01 FAS 242	0.2 MI E ACT. VT. 12	ROLLED BEAM	A - OPEN, NO RESTRICTION	1 - LOAD FACTOR	50	30	8	16	03 - TOWN	1949	---	490	6	129	39	40	45	66		H15, H10, OR UNKNOWN DESIGN LOAD OF BRIDGE	EXTERIOR BEAM / GIRDER		2 - H15 LOADING	100.0	25.5	23.0	\$1,651,500	\$734,400	1 - CONCRETE (C/P)	
WORCESTER	C2002	00026	09 - LOCAL (RURAL)	MINISTER BROOK	C2002	@ ACT. W CL3 TH3	CONCRETE SLAB	A - OPEN, NO RESTRICTION	1 - LOAD FACTOR	75	45	8	11	03 - TOWN	1996	---	260	2	139	46	48	78	87		ALL TRUCKS HAVE A RATING FACTOR > 1.0			0 - H25 LOADING	32.0	25.7	24.0	N/A	N/A	1 - CONCRETE (C/P)	
WORCESTER	C2002	00030	09 - LOCAL (RURAL)	MINISTER BROOK	C2002	0.18 MI TO ACT W VT12	ROLLED TIRRD BEAM	A - OPEN, NO RESTRICTION	2 - ALLOWABLE STRESS	46	31	8	11	03 - TOWN	1958	---	350	2	W29	33	37	48	68		H15, H10, OR UNKNOWN DESIGN LOAD OF BRIDGE			2 - H15 LOADING	52.0	18.3	21.0	\$618,540	\$274,061	1 - CONCRETE (C/P)	

## **Appendix B: Municipal Tax Rate Impact Calculation**











## **Appendix C: US 4 Photos**

## APPENDIX C: US 4 PHOTOS

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White River Junction



Between US 5 and I-89



Hartford West of I-89



Hartford, Approaching Quechee Gorge



Hartland, Approaching VT 12 Intersection



Hartland, approaching Taftsville



Woodstock, Between Taftsville and Woodstock Village



Woodstock, Approaching the right turn at the Hartland Hill Intersection



Woodstock Village



Woodstock Village, approaching VT 12



Woodstock, west end of Green



West Woodstock



Woodstock, west of the Village



Woodstock, Approaching Lincoln Covered Bridge



Woodstock, between Lincoln Bridge and Bridgewater



Bridgewater



Approaching VT 100A



Bridgewater between VT 100A and VT 100-South



Bridgewater, One mile east of VT 100 South





## **Appendix D: US 4 Truck Modeling Memo (UVM)**

## **TECHNICAL MEMO**

To: Joe Segale, VTrans Policy, Planning and Research Director  
From: Jim Sullivan, UVM TRC  
cc: Costa Pappis, VTrans Transportation Planning Coordinator  
Date: November 4, 2020  
Re: Woodstock Truck Study

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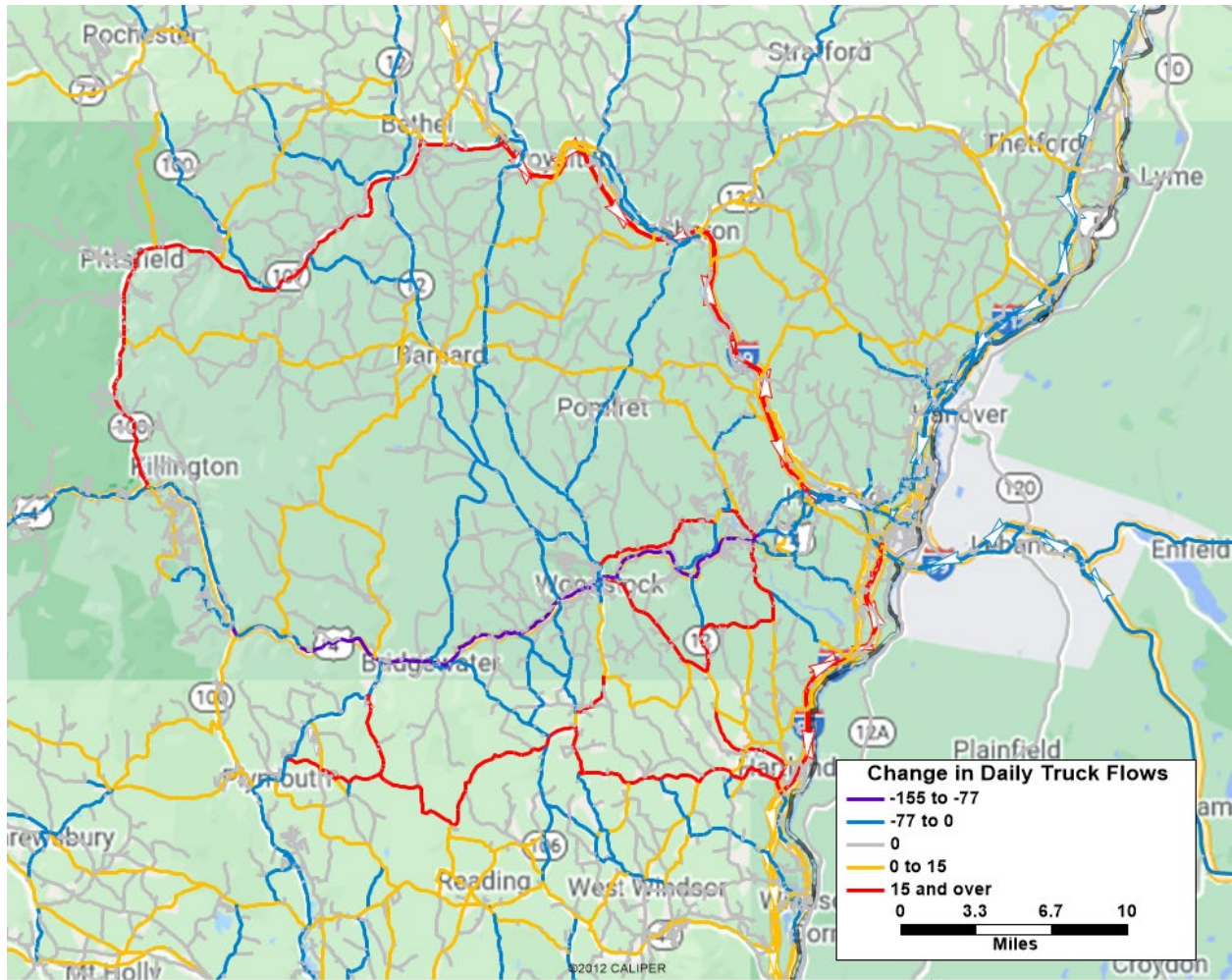
### **Scope**

This memo documents the results of a “before-and-after” analysis of truck traffic in Woodstock using the Vermont Travel Model (“the Model”). This work was performed under the “Operation of the Model” task of the *Improvement and Operation of the Vermont Travel Model: Year 13* contract. The analysis consisted of two Model runs to 2020 with standard outputs. The scope for this work was developed in a call and emails between VTrans and UVM TRC on October 29<sup>th</sup> and 30<sup>th</sup>.

The purpose of this study was to analyze the effects of truck restrictions being considered on US-4 between Hartford and Bridgewater. The Model was run with and without the truck restrictions and Model flows were analyzed for each run to see where the greatest changes took place. With trucks diverted from this section of US-4, there is interest in understanding where the alternate routes for diverted truck traffic will be.

### **Results**

Results are presented below as changes in daily traffic flows on each road segment in the US-4 corridor region. Changes in truck flows and in passenger-car flows are both presented, to see how the diversion of trucks affects the rest of the traffic on this corridor. The changes in daily truck flows with truck restrictions on US-4 are shown in Figure 1.



**Figure 1**

Truck flows displaced from US-4 are absorbed to the north by I-89, VT-107, and VT-100 between Hartford and Killington, and to the south by I-91, VT-12, VT-106, and series of local roads.

Table 1 provides the specific road segments that received the largest increase in daily truck flows after the diversion of truck traffic off of US-4. 2015 AADTs and Model flows are also provided to illustrate the general effectiveness of the Model at estimating total flows (passenger cars + trucks) on these segments.

**Table 1**

Road	Name	Lngh (mi.)	Daily Cap. (vpd)	Speed Limit (mph)	Town(s)	2015 AADT	2015 Model Flows	Change in Daily Truck Flows
TH-72	Lincoln St	0.62	6,363	30	Woodstock	--	0	59.1
VT-100		5.21	6,428	40	Killington / Pittsfield	3400	5465	50.0
VT-107		1.64	10,909	40	Bethel / Royalton	7000	9248	44.6

Road	Name	Lngth (mi.)	Daily Cap. (vpd)	Speed Limit (mph)	Town(s)	2015 AADT	2015 Total Model Flows	Change in Daily Truck Flows
TH-45	Merrill Hill Rd	1.51	4,545	35	Plymouth / Reading	--	31	42.0
TH-11	Mount Moses Trl	2.14	4,545	35	Reading	--	35	42.0
US-5		0.39	10,909	40	Hartland	4800	4250	40.5
VT-107		4.13	10,909	40	Stockbridge	3600	3714	39.8
VT-100		3.39	6,428	40	Pittsfield	3400	5373	39.7
VT-100		1.99	8,571	40	Stockbridge	3400	4558	39.0
VT-107		2.50	10,909	40	Stockbridge	2300	3198	38.9
VT-107		1.59	10,909	40	Stockbridge	3600	4100	38.5
VT-107	River St	1.85	10,909	40	Bethel	4200	4100	35.0
TH-39	Brown Schse Rd	4.72	4,545	35	Reading	--	0	37.3
TH-5	Hartland Hill Rd	4.13	4,545	35	Hartland / Woodstock	--	1947	33.8
TH-2	Quechee Rd	0.94	10,909	30	Hartland	--	887	33.0
VT-106	South Rd	0.90	10,909	40	Woodstock	--	860	32.8
TH-8	Quechee-Hartland Rd	1.87	10,909	30	Hartford	--	1230	30.8

Changes in daily passenger-car flows after the implementation of the truck restrictions on US-4 are shown in Figure 2.

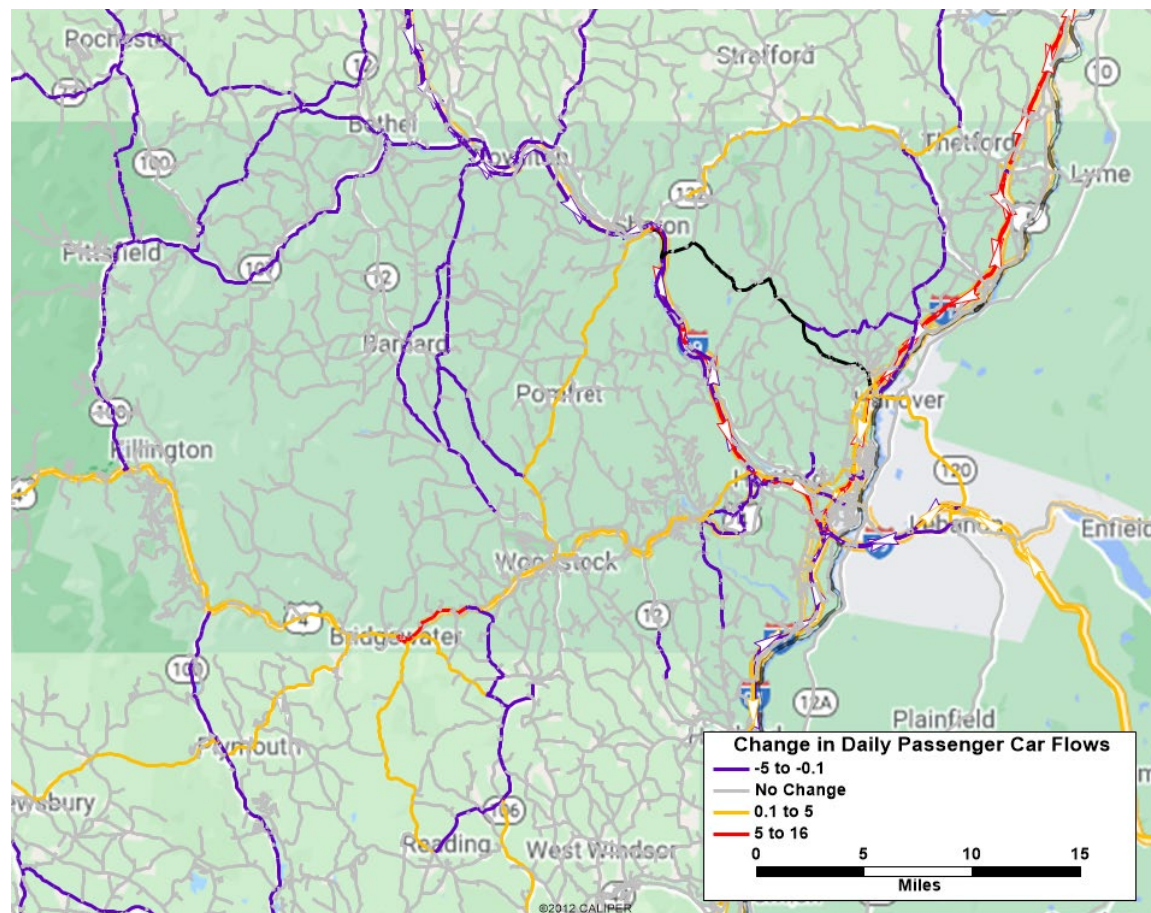


Figure 2

Although the changes in daily flows of passenger vehicles in the region are very small, it is interesting to note that flows on US-4 increase along the effected area. This change is due to the fact that US-4 currently operates at about 75-80% of its daily capacity, according to the Model. This means that at least a fraction of any truck traffic that is shifted off US-4 will be replaced by passenger car traffic which now chooses to use this route.

## Miles of Travel

Vehicle miles of travel (VMT) are also a significant indicator of the impact this truck restriction will have on emissions, travel times, and fuel use. The following table provides the changes in miles of travel that the Model runs indicated for trucks only, passenger vehicles only, and total vehicles. VMT impacts are presented separately statewide and for travel on US-4 only.

Miles of Travel Type	Statewide			On US-4 Only		
	Without Truck Restriction	With Truck Restriction	Change	Without Truck Restriction	With Truck Restriction	Change
Trucks	858,396	858,971	+575	1,925	0	-1,925
Passenger Vehicles	41,157,346	41,158,125	+779	112,834	114,683	+1,849
<b>Total VMT</b>	<b>42,015,742</b>	<b>42,017,096</b>	<b>+1,354</b>	<b>114,759</b>	<b>114,683</b>	<b>-76</b>

## Comments on Model Performance

The majority of the 2015 Model flows in this region are higher than their 2015 AADT counterparts, with an RMSE of 34%, which is consistent with the overall RMSE of the Model itself. AADTs are not perfect estimates of annual average daily traffic, they are based on traffic counts that are often based on shorter-term traffic counts grouped with others from similar roadway classes, so this disagreement shouldn't be assumed to correspond to poor Model performance.

The growth over the 2015-2020 period is well-researched, so the growth in traffic volumes over that period should be reliable. Additionally, The Model currently assumes NO GROWTH in travel to/from external-far TAZs like New York City and Boston, due to uncertainties with covid and the regional (New England) economy.

## **Appendix E: US 4 Crash Data**

Year	Month	Day	Town	Mile Marker	Descriptive Location	Crash Number	Truck Type	Crash Type	Direction of Collision	Weather	Time of Day	Surface Condition	Crash Description
2012	October	Wednesday	Bridgewater	0.05	Vermont Route 100S	12WNC0157	Tractor Trailer	Injury	Rear End	Clear	Day	Dry	Vehicle 1 was driving eastbound on US-4 and had slowed to stop at a red traffic light. Vehicle 2 did not slow down in time and struck/pushed Vehicle 1.
2015	February	Saturday	Bridgewater	2.83	Gunderson Rd	15WNC0028	Tractor Trailer	Property Damage Only	Trailer jackknife in weather	Freezing Precipitation	Day	Snow	Tractor trailer was negotiating a right curve in snowy weather then the trailer jackknifed and put the truck into a snow bank.
2014	January	Wednesday	Bridgewater	2.92	US Rt 4 & Raymond Hill Rd	14D300408	Tractor Trailer	Property Damage Only	Same Direction Sideswipe	Clear	Day	Snow	Crash involved two tractor trailers. Vehicle 1 was slowing to turn right into a pull off area when vehicle started to slide. Vehicle 1 driver went to correct the slide and pull back into the road but didn't realize a second tractor trailer was already beside him in the lane. The two trucks sideswiped.
2012	September	Monday	Bridgewater	6.34	Robinson Road	12WNC0118	Tractor Trailer	Property Damage Only	Same Direction Sideswipe	Clear	Day	Dry	Tractor Trailer driver travelling east on US-4 went into the guardrail just west of the intersection of Robinson Road. 144ft of guardrail was damaged.
2019	June	Tuesday	Bridgewater	6.74		19WNC0173	Tractor Trailer	Property Damage Only		Cloudy	Day	Dry	Vehicle stopped abruptly in front of a tractor trailer. The tractor trailer was able to stop in time but the tractor trailer behind him did not. The second tractor trailer rear ended the trailer of the first truck.
2011	August	Monday	Woodstock	2.7	Liberty Farm Road	11WK01428	Tractor Trailer	Injury	Opp Direction Sideswipe	Clear	Day	Dry	Vehicle 1 travelling westbound on US-4 drifted over the centerline and struck Vehicle 2 (tractor trailer) going eastbound. Tractor trailer driver saw vehicle was over the centerline and went right as far as possible. Medication is a possible factor for Vehicle 1 crossing the centerline.
2019	January	Thursday	Woodstock Village	5.75	Eaton Place	19WK00061	Tractor Trailer	Property Damage Only		Cloudy	Day		mini bus was stopping for a stop condition on side street but driver's feet got tangled up on the pedals and accidentally pushed the accelerator instead of the brake. The mini bus struck the side of the tractor trailer currently driving in the free flow lane.
2012	March	Friday	Woodstock Village	5.93	THE GREEN	12WK00402	Tractor Trailer	Property Damage Only	Same Direction Sideswipe	Clear	Day		PD went to pull over a tractor trailer and when the truck pulled to the side of the road, the trailer damaged the sideview mirror of a car parked on the street. The truck driver was driving a 72ft truck and had not obtained a state or local permit.
2017	November	Wednesday	Woodstock Village	5.93	College Hill Rd	17WK02109	Tractor Trailer	Property Damage Only			Day		Tractor Trailer sideswiped parking vehicle 1 along roadway. Vehicle 1 was parked against the flow of traffic and there was construction at this time where truck operator stated the cones were well past the centerline to where he did not think he could make gap between the cones and Vehicle 1 parked the way Vehicle 1 was.
2010	August	Saturday	Woodstock Village	6.25	Elm and Central Street	10WK01745	Tractor Trailer	Property Damage Only	Same Direction Sideswipe	Clear	Day	Dry	Vehicle 1 had parked on a corner of Central St. in a no parking zone to quickly run in the bank and use an ATM. Vehicle 2 (tractor trailer) turning the corner sideswiped parked Vehicle 1.
2014	March	Monday	Woodstock Village	6.27	Rt 4/Rt 12	14WK00269	Tractor Trailer	Property Damage Only	Rear-to-rear	Clear	Night	Snow	Vehicle 1 (Dump Truck) was assisting in snow removal from the Woodstock roads and sidewalks. Vehicle 1 was backing up on to US-4 to position itself and struck Vehicle 2's trailer (tractor trailer) as it was progressing down US-4.
2014	October	Tuesday	Woodstock Village	6.27	Elm Street	14WK01212	Tractor Trailer	Property Damage Only	Opp Direction Sideswipe	Clear	Day	Dry	Vehicle 1 (tractor trailer) was travelling east and looking to turn left to go north on Elm Street. The driver didn't realize there was a vehicle stopped that was too close beside the trailer. The trailer caught the driver's side rear and back of the stopped vehicle.
2018	January	Monday	Woodstock Village	6.37	High St	18WK00180	Tractor Trailer	Property Damage Only	Same Direction Sideswipe	Rain	Day	Wet	Driver of vehicle 1 had parked and opened up their driver side door. However, driver had not checked for oncoming traffic and a tractor trailer travelling along the road hit the door. The tractor trailer driver stated he would have moved to the left if he could but there was a bus in the lane going the other way.
2010	December	Thursday	Woodstock Village	6.84	Hartland Hill Rd	10WK02582	Tractor Trailer	Property Damage Only	Same Direction Sideswipe	Clear	Night	Dry	Tractor Trailer travelling on US-4 westbound slowed to take the turn onto Pleasant St. The driver however took the turn too sharp and the trailer travelled over the curb and struck the Maplefields Mobil sign causing damage.
2011	October	Monday	Woodstock Village	6.84	Hartland Hill Rd	11WK01824	Tractor Trailer	Property Damage Only	Right Turn, Same Direction, Rear End ^-^-	Clear	Day	Dry	Tractor Trailer travelling on US-4 westbound slowed to take the turn onto Pleasant St. The driver however took the turn too sharp and the trailer travelled over the curb and struck the Maplefields Mobil sign causing damage.
2012	June	Friday	Woodstock Village	6.84	MAPLEFIELDS MOBIL	12WK00948	Tractor Trailer	Property Damage Only	Same Direction Sideswipe	Cloudy	Day	Dry	Tractor Trailer travelling on US-4 westbound slowed to take the turn onto Pleasant St. The driver however took the turn too sharp and the trailer travelled over the curb and struck the Maplefields Mobil sign causing damage. Tractor Trailer was 72ft. and did not have a permit.
2012	December	Saturday	Woodstock	999.99		12WK02225	Tractor Trailer	Injury	Trailer jackknife in weather	Freezing Precipitation	Day	Snow	Crash occurred due to inclement weather and visibility. A tractor trailer was giving a plow truck going in the opposite direction some room and the trailer slipped on the snow and started to jackknife. The trailer then struck another vehicle overturning that vehicle. Tractor Trailer was 72ft. and did not have a permit.
2013	May	Thursday	Hartford	0.03	Wood Road	13HF01597	Tractor Trailer	Fatal	Head On	Clear	Day	Wet	Vehicle 1 was travelling on US-4 and did not negotiate right curve in road. By going straight through the curve, Vehicle 1 went into the opposite lane and was struck head on by a tractor trailer going the other way. Vehicle 1 driver was killed by the collision.
2017	November	Wednesday	Hartland	0.5		17B204959	Tractor Trailer	Injury	Head On	Clear	Night	Dry	Vehicle 1 was taking a right turn off route 12 on to US-4 toward Quechee. Vehicle 1 took the right turn wide and crossed the centerline striking a tractor trailer currently travelling along US-4. Vehicle 1 driver charged with DUI.
2019	September	Thursday	Hartford	1.93	West Gilson Ave	19HF05793	Tractor Trailer	Property Damage Only	Single Vehicle Crash	Clear	Day	Wet	Tractor trailer headed westbound swerved to avoid contact with an unidentified vehicle. Tractor trailer then over corrected, went across both lanes of the road, and went into a tree.
2018	June	Monday	Hartford	3.29	Deweys Mills Rd	18HF03243	Tractor Trailer	Injury	Rear End	Clear	Day	Dry	3 car motor vehicle crash. Vehicle 1 was eastbound and had stopped to turn into the Quechee gorge gift shop. Vehicle 2 (tractor trailer) could not slow down in time and rear ended Vehicle 1. Vehicle 1 was then pushed across the lane where it struck Vehicle 3 going the other way.
2018	September	Tuesday	Hartford	3.29	DEWEYS MILLS ROAD	18HF05275	Tractor Trailer	Property Damage Only	Rear End	Clear	Day	Dry	Vehicle 1 (tractor trailer) was travelling westbound and had stopped for pedestrians crossing the road near Quechee gorge bridge. Vehicle 2 travelling behind vehicle 1 did not slow down in time and rear ended the trailer of Vehicle 1.

Year	Month	Day	Town	Mile Marker	Descriptive Location	Crash Number	Truck Type	Crash Type	Direction of Collision	Weather	Time of Day	Surface Condition	Crash Description
2015	October	Thursday	Hartford	5.64	Route 4 Deli	15HF03767	Tractor Trailer	Property Damage Only	No Turns, Thru moves only, Broadside ^<	Cloudy	Day	Dry	Vehicle 1 turning left on to US-4 did not give way to a tractor trailer already driving along US-4. Vehicle 1 went into the trailer of tractor trailer and cause slight damage.
2018	June	Friday	Hartford	5.65	Route 4 Country Store; #3699	18HF02852	Tractor Trailer	Property Damage Only	Rear End	Clear	Day	Dry	Vehicle 1 stopped abruptly on US-4 to turn left into a country store. Vehicle 2 (tractor trailer) slammed on brakes and swerved but could not slow down in time. Vehicle 2 rear ended Vehicle 1. Vehicle 1 then accelerated instead of braking and went into the side of the country store.
2013	April	Tuesday	Hartford	6.51	Interstate 89, Exit 1	13HF01340	Tractor Trailer	Property Damage Only	Rear End	Cloudy	Day	Dry	Vehicle 1 was at a stop sign at the end of the exit ramp to turn left on US-4. Vehicle 2 (tractor trailer) was behind Vehicle 1 and thought Vehicle 1 had already made the turn. Because of the height and hood length of the tractor trailer, he could not tell Vehicle 1 was still in front of him. When Vehicle 1 went forward, it struck Vehicle 1 which was still there.
2014	September	Thursday	Hartford	6.51	I-89 Exit 1	14HF03321	Tractor Trailer	Injury	No Turns, Thru moves only, Broadside ^<	Cloudy	Day	Dry	Vehicle 1 was attempting to stop for the stop sign at the end of the ramp for Exit 1 (I-89). However, the braking system failed and the brake pedal went to the floor. The vehicle was stuck by a tractor trailer travelling on US-4.
2017	March	Tuesday	Hartford	9.15	Woodstock Rd	17HF01257	Tractor Trailer	Property Damage Only	Right Turn and Thru, Head On v^--	Clear	Day	Dry	Tractor trailer going westbound on US-4 made a right turn on Mill Rd. The tractor trailer took the right turn wide and contacted a car stopped at mill road. The contact pushed the car back 10-15 feet.
2012	September	Monday	Hartford	9.39	Hartford Avenue	12HF03329	Tractor Trailer	Property Damage Only	Left Turn and Thru, Broadside v<--	Clear	Day	Dry	Vehicle 1 was traveling easterly on Maple Street when attempting to turn left into the parking lot. Vehicle 1 thought the operator of Vehicle 2 waved him to go ahead and turn when V#2 then pulled forward and disappeared from his mirrors. Vehicle 1 could no longer see Vehicle 2 in his mirrors. Vehicle 1 proceeded to turn and crashed into the driver side corner of Vehicle #2.
2015	June	Monday	Hartford	9.56	Prospect Street	15HF02003	Tractor Trailer	Property Damage Only	Single Vehicle Crash	Cloudy	Night	Dry	Tractor trailer carrying a piece of heavy equipment struck the lower side of the railroad bridge while trying to proceed underneath it. Suspicion is the the boom on the heavy piece of equipment might have been extended and hit the bridge.
2013	March	Saturday	Hartford	999.99	Chester Arthur Road	13HF00843	Tractor Trailer	Property Damage Only	Opp Direction Sideswipe	Cloudy	Day	Dry	Vehicle 1 driver was dozing off at the wheel and crossed the centerline. Vehicle 1 then collided with the third axle of Vehicle 2 (tractor trailer).