

CEREMONIAL RIBBON CUTTING, 2020
OPENING OF MIDDLEBURY BRIDGE & RAIL TUNNEL



DRAFT
**VERMONT
RAIL PLAN**

MARCH 2021

PLANNING THE NEXT 20 YEARS OF
INTERCITY PASSENGER & RAIL

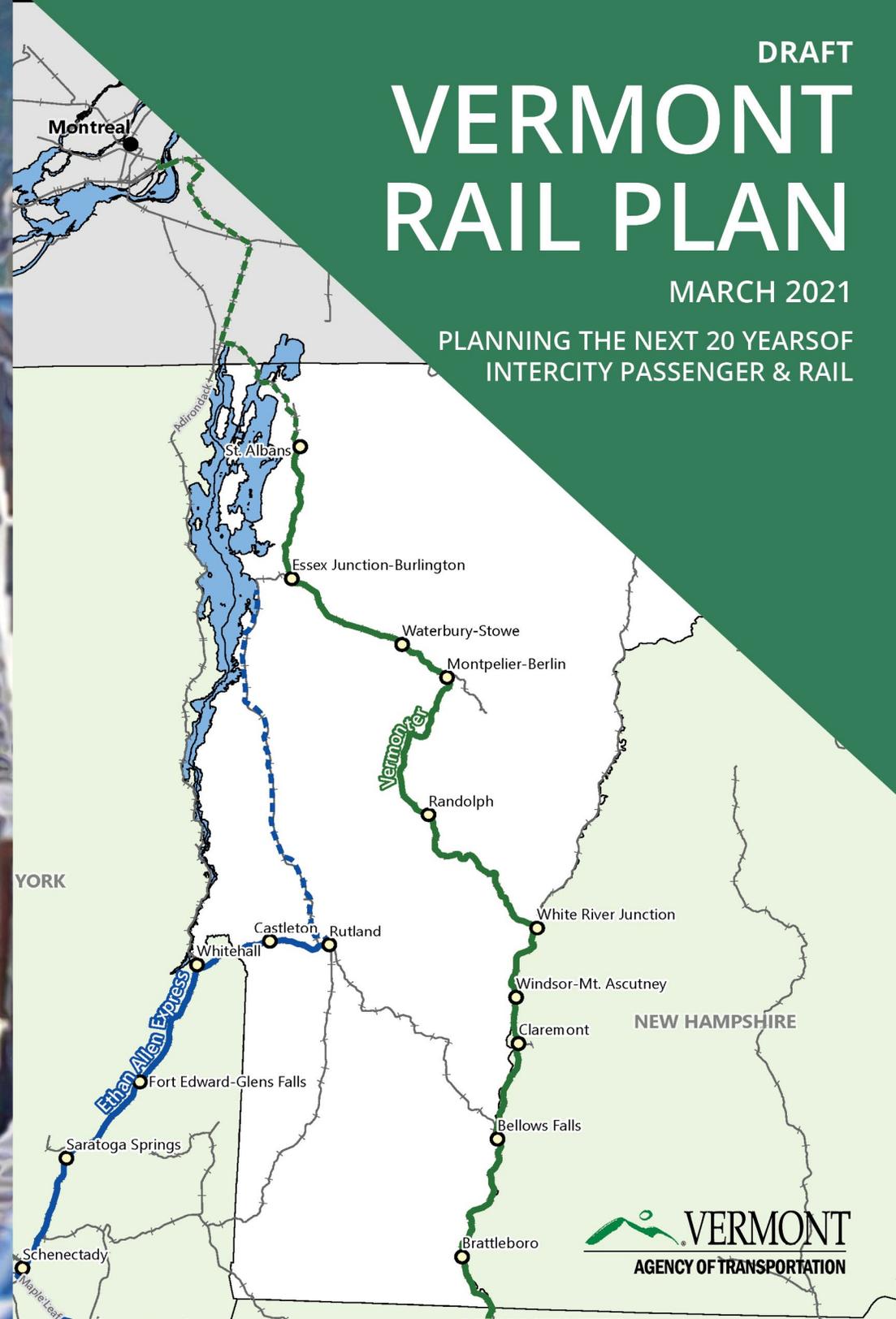


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LIST OF ACRONYMS

AAR	Association of American Railroads
ACCD	Agency of Commerce and Community Development
VTrans	Vermont Agency of Transportation
ARRA	American Recovery and Reinvestment Act
BUILD	U.S. Department of Transportation's Better Utilizing Investments to Leverage Development (grant program)
CFS	Commodity Flow Survey
CLP	Clarendon & Pittsford Railroad
CN	Canadian National
COVID-19	Coronavirus Disease 2019
CP	Canadian Pacific
CRISI	Consolidated Rail Infrastructure and Safety Improvements
FAST	Fixing America's Surface Transportation Act
FFY	Federal Fiscal Year
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GHG	Greenhouse Gas
GIS	Geographic Information System
GMRC	Green Mountain Railroad
GW	Genesee and Wyoming
HAZMAT	Hazardous Materials
L RTP	Long Range Transportation Plan
MPH	Miles per hour
MPO	Metropolitan Planning Organization
NECR	New England Central Railroad
PAR	Pan Am Railways
PAS	Pan Am Southern

PRIIA	Passenger Rail Investment and Improvement Act
PTC	Positive Train Control
RPC	Regional Planning Commission
RRIF	Rail Rehabilitation and Improvement Financing
RSIA	Rail Safety Improvement Act
SDP	Service Development Plan
SIB	State Infrastructure Bank
SLR	St. Lawrence & Atlantic Railroad
SRP	State Rail Plan
TIB	Transportation Infrastructure Bonds
TIGER	Transportation Investment Generating Economic Recovery
TIP	Transportation Improvement Program
VMT	Vehicles Miles Travelled
VPSP2	Vermont Project Selection & Prioritization Processes
VRAC	Vermont Rail Advisory Council
VRS	Vermont Rail System
VTR	Vermont Railway
WACR	Washington County Railroad

1.0 INTRODUCTION

Rail is an integral part of the Vermont multimodal transportation system that keeps people and the economy moving. Serving freight and passengers, the rail system provides efficient transportation critical to maintaining our economy, environment, and quality of life. The Vermont Rail Plan comes during a time of change for rail transportation in the State and nationally, including due to the COVID-19 pandemic.

In April 2020, the Vermont Agency of Transportation (VTTrans) began to update the State Rail Plan (2015) and State Freight Plan (2012 with minor revisions in 2013, 2015 and 2017) to meet with Federal regulations under the Passenger Rail Investment and Improvement Act (PRIIA) and Fixing America’s Surface Transportation (FAST) Act. Although two separate documents, there is a significant amount of overlap between the efforts as shown in Figure 1.1. The State Freight Plan will be published later in 2021.

FIGURE 1.1 VERMONT FREIGHT AND RAIL PLAN ELEMENTS



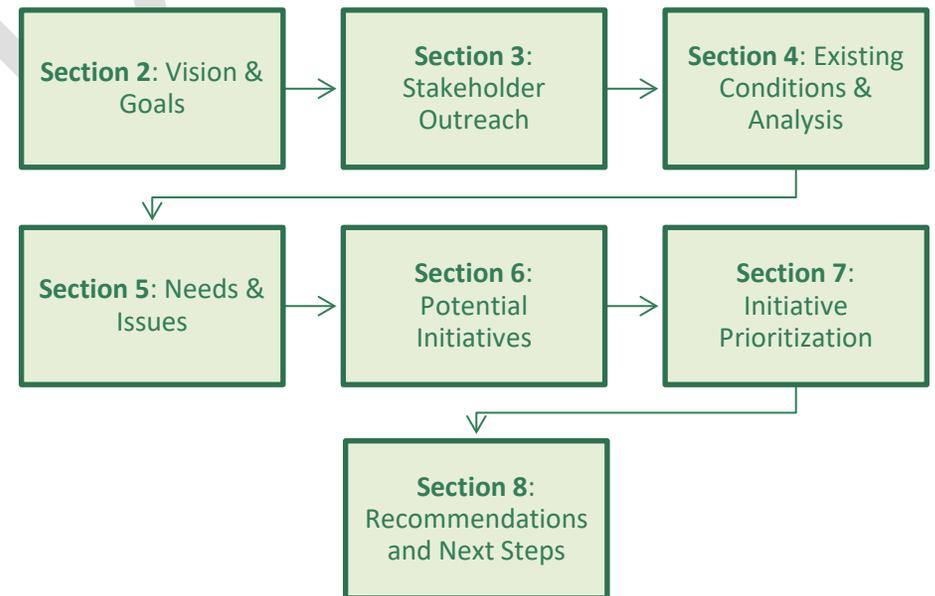
Although two separate planning efforts, the Freight and Rail Plans share common tasks and work products.

Source: Cambridge Systematics, 2020.

This document—the Vermont Rail Plan—provides a framework for maintaining and enhancing the State's rail system in a manner that also supports other State goals. It focuses on intercity passenger service provided by Amtrak as well as rail freight. Commuter rail is a form of public transit that is addressed as part of public transit plans.ⁱ

The Rail Plan is an engaging overview that refers readers to appropriate sections of the substantial supporting technical (tech) memos. It consists of interconnected sections shown in Figure 1.2. **Key points are bolded and the report is brief to help make this important subject more accessible.**

FIGURE 1.2 VERMONT RAIL PLAN SECTIONS



The tech memos are available on the VTrans Rail Reports web page (<https://vtrans.vermont.gov/rail/reports>) and include:

- Tech Memo 1 – Existing Conditions;
- Tech Memo 2 – Commodity Flow and Economic Futures;
- Tech Memo 3 – Vision, Goals, Needs and Potential Initiatives;
- Tech Memo 4 – Passenger Rail Ridership Forecasting;
- Tech Memo 5 – Prioritization and Recommendations; and
- Tech Memo 6 – Public Participation and Comments.

The Vermont Rail Plan is fully compliant with PRIIA, as shown in Table 1.1, with information provided both in the Final Plan itself as well as the Tech Memos posted online. The State is in compliance with Title 49 USC Section 22102.

TABLE 1.1 PRIIA REQUIREMENTS

PRIIA Requirement	Where Found?
An Executive Summary that highlights key facts and findings of the State rail plan	Executive Summary (separate document)
An inventory of the existing overall rail transportation system and rail services and facilities within the State and an analysis of the role of rail transportation within the State’s surface transportation system	Final Report Section 4; Tech Memo 1 and 2.
A review of all rail lines within the State, including all freight rail lines, intercity passenger rail lines, commuter rail lines, and proposed high-speed rail corridors and significant rail line segments not currently in service.	Final Report Section 4; Tech Memo 1
A Statement of the State’s passenger rail service objectives, including minimum service levels, for rail transportation routes.	Final Report Section 7

PRIIA Requirement	Where Found?
A general analysis of rail’s transportation, economic, and environmental impacts in the State	Final Report Section 4 & 8; Tech Memo 1 & 2
A long-range rail investment program for current and future freight and passenger infrastructure in the State that meets the requirements of subsection (b) [of this section – “Long-Range Service and Investment Program”]	Final Report Section 8; Tech Memo 5
A statement of public financing issues for rail projects and service in the State, including a list of current and prospective public capital and operating funding resources, public subsidies, State taxation, and other financial policies relating to rail infrastructure development.	Final Report Section 8; Tech Memo 1 & 5
An identification of rail infrastructure issues within the State that reflects consultation with all relevant stakeholders.	Final Report Section Section 4 & 5; Tech Memo 3
A review of the major passenger and freight intermodal connections and facilities within the State.	Final Report Section Section 4; Tech Memo 1
A review of publicly funded projects within the State to improve rail transportation safety and security, including all major projects funded under section 130 of title 23.	Tech Memo 1;
A performance evaluation of passenger rail services operating in the State, including possible improvements in those services and a description of strategies to achieve those improvements.	Final Report Section Section 5; Tech Memo 4
A compilation of studies and reports on high-speed rail corridor development within the State not included in a previous plan under this subchapter, and a plan for funding any recommended development of such corridors in the State.	Tech Memo 1
A statement that the State is in compliance with Title 49 United States Code Section 22102	Final Report Section 1

2.0 VISION AND GOALS

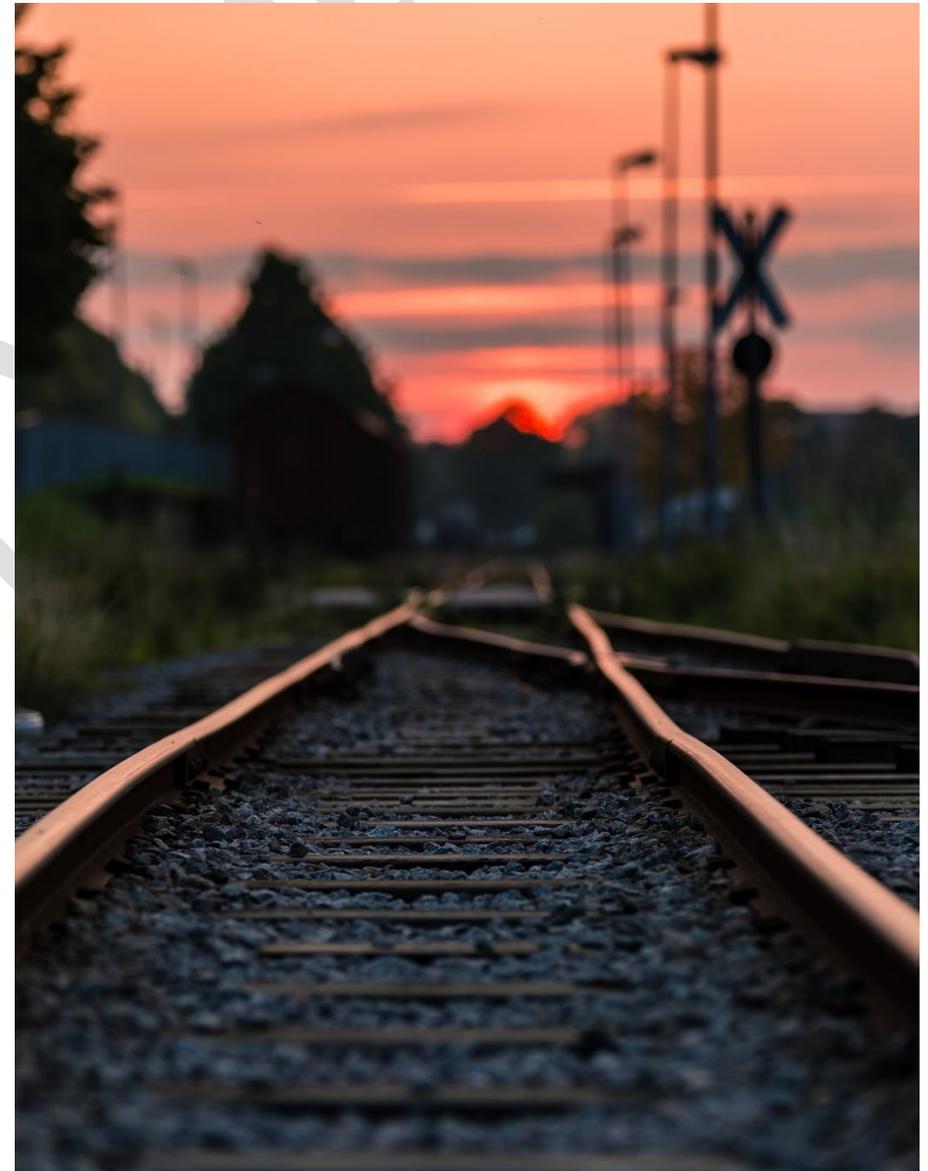
The updates of the State Rail Plan and State Freight Plan have adopted the vision developed for all modes in the 2040 Vermont Long-Range Transportation Plan (LRTP).ⁱⁱ

“A safe, reliable and multimodal transportation system that grows the economy, is affordable to use and operate, and serves vulnerable populations.”

The goals to achieve this vision (see Figure 2.1) are adopted from the 2015 Plan with some slight modifications. **These goals align with the State’s LRTP and on-going efforts to develop VTrans’ Project Selection and Prioritization Processes (VPSP2).**

FIGURE 2.1 VERMONT RAIL PLAN GOALS

- Maintain existing system (State of Good Repair)
- Expand capacity to accommodate growth
- Increase rail system use (freight & passenger)
- Fund the rail system adequately and sustainably
- Improve intermodal connectivity (freight & passenger)
- Act on opportunities for ancillary economic development
- Enhance safety, security & resiliency



Source: Pexels

3.0 STAKEHOLDER OUTREACH

For this effort, VTrans developed a strategy that leveraged digital engagement and provided several opportunities for interaction while maintaining public health protocols. The process was interactive: feedback informed plan development and recommendations, and stakeholders were frequently updated on plan progress. The outreach approach followed a set of guiding principles:

- **Be flexible and engaging.** Given the unforeseen nature of the pandemic, we developed many communication channels, including virtual meetings, an interactive web map (see Figure 3.1), e-blasts, social media, and digital newsletters (see Figure 3.2).
- **Entice with “carrots”.** The team attracted involvement by communicating how stakeholders can directly benefit from sharing ideas and input, and by demonstrating how previous efforts have led to positive change.
- **Seeing is believing.** Visuals help people comprehend and remember.
- **Learn by listening.** Stakeholder feedback validated and provided nuance to data, thereby influencing the plan findings and recommendations.

Virtual Meetings With Stakeholders

Virtual meetings, using Microsoft Teams and Zoom, are a dynamic forum to provide information and field questions or comments in real time. VTrans used two rounds of virtual meetings held at critical junctures in the planning process. In September, the first round of virtual meetings introduced the plan purpose and goals as well as initial analysis results. In December, the second round of virtual meetings focused on reviewing potential Rail Plan initiatives and the technical analysis conducted as part of considering them.

VTrans held two virtual Town Halls to reach a wider public audience. Approximately 80 people attended the meeting held on October 6th and 65

attended the December 17th, 2020 meeting. These participants provided thoughtful questions and commentary used throughout the the Rail Plan.

In addition, VTrans held numerous discussions with Regional Planning Commissions (RPC) across the State, both with staff and Transportation Advisory Committees. The outreach efforts were supplemented by interviews with railroads operating in the State, specifically calls with Genesee & Wyoming (July 2020), Vermont Rail Systems (July 2020), Pan Am Railways (August 2020), and Canadian Pacific (October 2020). Additional outreach via email and the Vermont Rail Advisory Council (VRAC) was used to gather input on specific concerns such as vertical clearance restrictions and ideas for possible initiatives. A description of VRAC’s composition and mission is provided in Section 4.1.

Digital Communications

VTrans relied heavily on digital communication to receive input and keep stakeholders up-to-date during Plan development. VTrans provided content and updates through their plan web page. VTrans also developed and maintained an interactive geographic information system (GIS)-based web tool, which served two distinct purposes. As a central resource, it succinctly compiles data that, while publicly available, would require an inquiring mind to know about and scour several VTrans resources to find. Second, the tool acted as a platform to collect information, ideas, and feedback from stakeholders. A screenshot of this tool is shown in Figure 3.1.

To provide timely updates and increase awareness, three digital newsletters were created. Each two-page newsletter outlined essential content such project happenings, meeting dates, and relevant rail data through infographics, photos, and text. An example from the Fall newsletter is shown in Figure 3.2. The newsletters were delivered to the stakeholder database using VTrans’ Constant Contact platform and advertised on VTrans’ social media feeds.

Comments received via email, the web tool, and spoken or written during the meetings were documented. In total, approximately 140 comments were received across all engagement platforms and are included Tech Memo 6.

FIGURE 3.1 WEB TOOL SCREEN CAPTURE

Source: VTrans

FIGURE 3.2 NEWSLETTER ISSUE 2 EXAMPLE

Source: FHI

4.0 RAIL SYSTEM CONDITIONS

Vermont has been hard at work, advancing or completing a number of critical projects since the 2015 Rail Plan was completed, including:

- Extending the *Ethan Allen Express* to Burlington including track and station projects with an anticipated start-of-service in early 2022. One of the largest projects was the completion of the Middlebury Tunnel (see right).
- Rehabilitating or replacing 31 bridges (see below) on the Vermont Railway (VTR) between Hoosick Junction, NY and Rutland, VT to allow for 286,000 pound operation through a 2018 Federal Highway Administration (FHWA) Better Utilizing Investments to Leverage Development (BUILD) Grant.
- Re-routing of approximately one mile of the Washington County Railroad (WACR) mainline to avoid two weight-restricted bridges near Montpelier.

This section provides an overview of the State's freight and passenger rail networks as well as key information on use, existing conditions, and projected future conditions. It focuses on background useful to discussing the initiatives.

There is extensive additional background available in the additional technical memos on the VTrans website

(<https://vtrans.vermont.gov/rail/reports>).



Bridge being replaced on VTR as part of 2018 BUILD Grant. Source: VRS

Middlebury Tunnel Project

One of the largest projects completed in recent years is the replacement of two badly decayed and substandard bridges in downtown Middlebury with a 360' rail tunnel. Constructed over a period of three years at a cost of \$71 million, the new tunnel provides operational improvements for the railroad through 21' vertical clearances and improved track geometry. Equally importantly, it brings renewed vitality to the downtown through a re-imagined streetscape, expanded green space along the corridor, as well as updated utility infrastructure. Minimizing disruption to area businesses, vehicle traffic and the railroad required careful planning and coordination throughout the period of construction.



Source: VHB

4.1 State Rail Program

Within VTrans’ Policy, Planning and Intermodal Development Division, **the Rail and Aviation Bureau manages State-owned rail assets in Vermont and serves as a steward of the State’s rail network.** The Rail Program also prioritizes and helps coordinate highway-rail at-grade crossings, including safety improvements funded under the Railway-Highway Crossing improvements Program, specified by 23 U.S. Code 130. Figure 4.1 displays the organization of the VTrans Policy, Planning and Intermodal Development Division. This document is being developed by its Policy and Planning Group.

VTrans was designated the State’s rail planning agency by the Vermont legislature in 1973. Vermont Statutes Annotated (VSA) Title 5 describes VTrans’s powers in a number of areas including rail. Chapter 20 authorizes VTrans to supervise and direct execution of all laws and Transportation Board orders relating to public transportatoin corporations, firms, and individuals. Chapter 56 gives VTrans the authority to receive, manage, use, or expend federal and State funds to promote or develop intercity passenger rail service or facilities, contract with Amtrak or other railroads, and acquire land (among other powers) and Chapter 58 deals specifically with VTrans authority for State Acquisition of Railroads.ⁱⁱⁱ

A Vermont Rail Council was created in 1993 to advise the Governor and VTrans on rail policy matters. In 2003, Executive Order #13-03 re-established it as the Rail Advisory Council (VRAC) and designated its membership and duties anew. The VRAC provided overall guidance throughout this Rail Plan update.

In addition to VTrans and the VRAC, a number of State and regional organizations have an interest in the performance of the Vermont rail system in carrying out their responsibilities. Vermont’s 11 regional planning

commissions (RPCs) are tasked with developing regional plans, and coordinating activities across member municipalities. Among the planning issues addressed by these organizations is transportation, including rail. The Chittenden County RPC also serves as the Metropolitan Planning Organization (MPO) for Burlington and surrounding areas.¹ MPOs are policy-making organizations that are funded in part by the federal government and are required for urban areas with populations over 50,000. They are required to maintain a LRTP as well as a Transportation Improvement Program (TIP), which include projects to be funded using federal sources.

FIGURE 4.1 VTRANS POLICY, PLANNING, AND INTERMODAL DEVELOPMENT DIVISION ORGANIZATIONAL CHART



Source: <https://vtrans.vermont.gov/about/org-charts>

¹ This is the only MPO in Vermont.

4.2 Passenger Rail

Overview

Vermont is served by two regularly scheduled interstate passenger rail services, the *Vermont* and the *Ethan Allen Express* with routes shown in Figure 4.2.

Both services are operated by Amtrak with financial support provided by the State. **The two Amtrak services have been suspended since March 26, 2020 as a result of the COVID-19 pandemic. Both trains are anticipated to resume operation, with timing dependent on the state of the pandemic.**

Vermont

The *Vermont* operates daily between Washington, D.C. and St. Albans taking 13 hours and 45 minutes to cover the approximately 600 mile distance. In Vermont, the *Vermont* covers approximately 185 miles using track owned by New England Central Railroad (NECR). In addition to Vermont, financial support for operating the *Vermont* is provided by Connecticut and Massachusetts.

The *Vermont* makes 30 stops between Washington and St. Albans, including nine in Vermont and one in New Hampshire (Claremont). The Claremont stop is supported financially by Vermont.

Ethan Allen Express

The *Ethan Allen Express* connects Rutland and Castleton (Vermont) to New York City via Albany. The train covers approximately 241 miles, fifteen of which are in Vermont over tracks owned by the Clarendon & Pittsford Railroad. The train is supported financially by Vermont and New York.

Work to extend the *Ethan Allen Express* from Rutland to Burlington is substantially complete with service expected to launch in 2022. In addition

to serving Burlington, the extended route will also have stops in Middlebury and Vergennes.

Tourist Trains and Abandoned, Out of Service, Rail-Banked, and Embargoed Lines

Prior to the disruptions caused by COVID-19, the Green Mountain Railroad (GMRC) operated a range of tourist trains within Vermont on a seasonal basis. This included trips originating from Burlington and Chester. From Chester, three to four trips per week ran to Rockingham Falls or Rutland during September and October. From Burlington, GMRC offered a dinner train, a murder mystery train, a wine tasting train, and other specialty trips.^{iv}

Since 2015, only one petition for rail abandonment was filed. In September 2018, the Surface Transportation Board accepted a notice of interim trail use request by the Town of Bennington. This request will allow a portion of the Vermont Railways (VTR) Bennington Branch from River St. in Bennington the bridge over Furnace Brook to be used as an interim trail subject to future restoration of rail service.^v No additional rail lines in Vermont have been abandoned, placed out of service, or rail-banked since the 2015 State Rail Plan (SRP). The Lamoille Valley Railroad ceased operations in 1994. Part of that right of way is a highly regarded rail trail and more miles of conversion are coming.

While the Twin State Railroad has been dormant since 2011, the pending acquisition of Pan Am Railways by CSX may revive interest in the line as an alternative link between Vermont's rail network, New Hampshire and Maine, as well as Atlantic Canada. This situation will be closely monitored.

FIGURE 4.2 VERMONT PASSENGER RAIL LINES

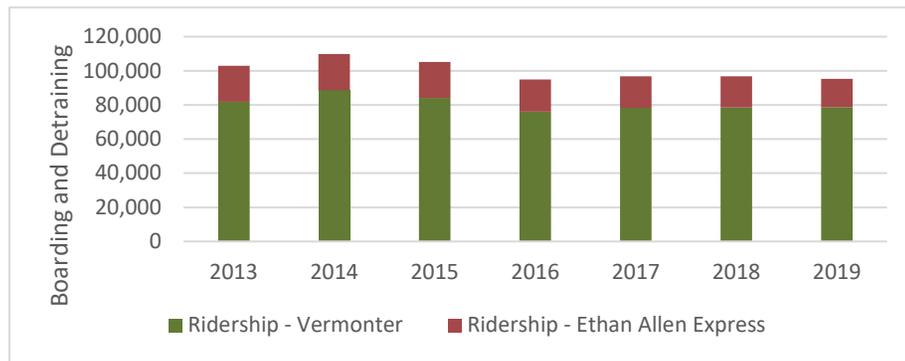


Source: Vermont Rail Plan/VHB, 2021.

Passenger Ridership Trends

Prior to 2020 and the onset of the COVID-19 pandemic, **total Amtrak ridership in Vermont had been relatively steady, with around 95,000 passengers boarding or detraining at a Vermont station annually from Fiscal Year (FY) 2016 to 2019.**² This is a decrease from a high in 2014 of more than 105,000 passengers, as shown in Figure 4.3. About 80 percent of the riders are using the *Vermont*.

FIGURE 4.3 VERMONT AMTRAK RIDERSHIP (FY2013-2019)



*Note in 2014 ridership by service data was not available. Source: Amtrak.

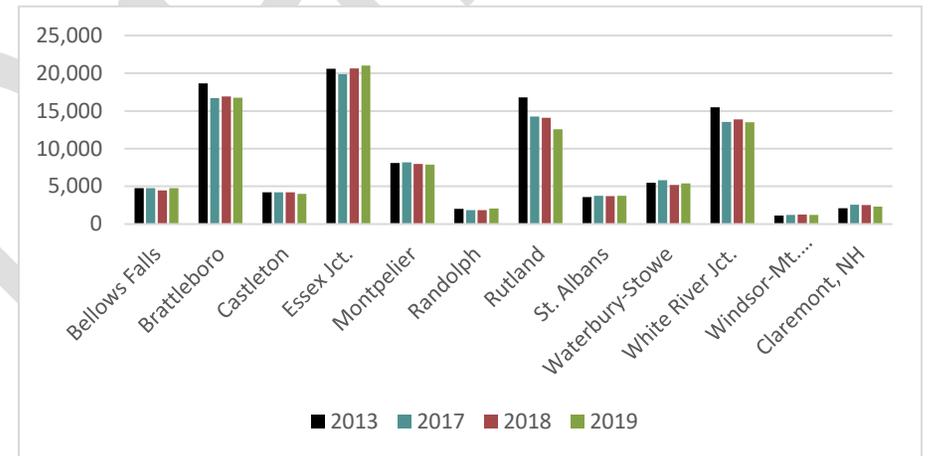
Construction impacts of rail projects in Connecticut and Massachusetts may have contributed to a decline in ridership due to service interruptions or delays. Construction activity on the New Haven-Springfield-East Northfield corridor was underway through 2019, including the addition of double-track along various segments of the 62-mile corridor south of Springfield.^{vi} In addition, upgrades in Vermont and New Hampshire, and a rerouting of service in Massachusetts have been completed since 2012. **These projects result in a cumulative reduction in travel time of 45-80 minutes and improved reliability for Vermont travelers.**

² All dates are Federal Fiscal Year unless otherwise noted.

Total ridership on the *Vermont* and *Ethan Allen Express* has grown to more than 151,000 in 2019 when including riders in Massachusetts, Connecticut, and New York (north of Albany).

Figure 4.4 shows ridership by station with the base of 2013 and then jumping to more recent years. **Rutland, White River Junction, and Brattleboro have seen decreases in ridership while Essex Junction has seen an increase.**

FIGURE 4.4 VERMONT AMTRAK RIDERSHIP BY STATION



Source: Amtrak

Vermont is committed to intercity passenger rail. This report continues to use a performance measure from the 2015 Rail Plan of five percent annual growth in ridership. In addition, the 2011 Vermont Comprehensive Energy Plan (CEP) set a goal of increasing Vermont-based passenger rail trip to 400,000 annually by 2030. The 2016 CEP maintains this goal as part of an overall strategy to, "Reduce total transportation energy use by 20 percent from 2015 levels by 2025."^{vii}

Multimodal Connections and Station ADA Status

The last mile (or ten) to a passenger's final destination is an essential part of using passenger rail. Passengers getting off a train need to be able to go to a well-maintained parking lot, a safe place to be picked up, or a convenient next mode. In particular, there is need to enhance bus connections. Nine of the twelve Amtrak stations in Vermont (including Claremont, New Hampshire) are located in proximity to fixed route bus service but schedules may not match in a useful, reliable manner. As of 2021, a microtransit system called MyRide provides flexible service to the Montpelier-Berlin (aka Montpelier Junction) station. There is no fixed route transit service near the Windsor-Mt. Ascutney and Claremont stations. Intercity bus service via Greyhound connects White River Junction to New York City with stops in Bellows Falls and Brattleboro.^{viii} Vermont Shires Connector provides bus service between Manchester Center and Bennington to the Albany International Airport, Albany's Greyhound Bus Terminal, Albany-Rensselaer Amtrak Station but does not connect to Amtrak service in Vermont.^{ix} ³ Service has been disrupted due to COVID-19 but expansion of the service north to Rutland, including a stop in Wallingford, is planned. The Connector also provides service along Rt. 7 from Colchester through Burlington, Middlebury, Brandon, Rutland, and Castleton to Albany.

Safe pedestrian accommodation at grade crossings in town centers and other busy pedestrian areas, sidewalks and crosswalks, and potential multiuse paths and/or "rails with trails" are treatments that can be considered to accommodate safe pedestrian access to/from rail stations.

Complying with the requirements of the Americans with Disabilities Act (ADA) ensures that all potential users can board a train and utilize station amenities

such as restrooms, parking lots and waiting areas. As shown in Table 4.1, most of the amenities at Vermont's stations are ADA accessible, and additional projects are in development to improve accessibility as well as overall function and condition. As of 2021, **VTrans is assessing the needs for improvements at Vermont stations and how to advance the priorities.**



New Randolph platform to the left of track. Source: Cambridge Systematics.

Passenger Rail Equipment

Both the *Vermont* and the *Ethan Allen Express* are operated using standard Amtrak Northeast Corridor intercity rolling stock, consisting of single level Amfleet passenger cars and P42 diesel (*Vermont*) or P32ACDM dual-mode (*Ethan Allen Express*) locomotives. The Amfleet equipment dates from the mid-1970's, and the locomotive fleet is in excess of 20-years in age, with both approaching an age where replacement is required. **Vermont is working with other Eastern states, Washington State, and Amtrak to procure new rolling stock that will be used with both the *Vermont* and the *Ethan Allen Express*.** Offerors have submitted proposals that are being evaluated by Amtrak and its State partners, with a decision expected in 2021.

³ Table 3.4 in Tech Memo 1 includes a full list of all multimodal connections available at or near Amtrak stations in Vermont.

TABLE 4.1 VERMONT AMTRAK STATION AMENITIES AND ADA PROJECT STATUS

Station	Amenity										ADA Project Status
	PLATFORM	WAITING AREA	WHEELCHAIR LIFT	RESTROOMS	PAYPHONE	WIFI	ATM	VENDING MACHINE	SAME DAY PARKING	OVERNIGHT PARKING	
Rutland	ADA	ADA	No	ADA	Yes	No	No	No	ADA	ADA	To be determined. City of Rutland responsible for Station Structure and Parking, State of Vermont responsible for Platform
Castleton	ADA	ADA	Yes	ADA	No	No	No	No	ADA	ADA	Projects completed FY2017-2020
St. Albans	ADA	Yes	No	Yes	No	No	No	Yes	ADA	ADA	Projects completed FY 2012-2014
Essex Junction	ADA	ADA	Yes	No	Yes	No	No	No	ADA	ADA	Project planned FY2021 (Structure, Platform, and Parking all under Amtrak responsibility) ^x
Waterbury-Stowe	ADA	ADA	Yes	ADA	Yes	No	No	No	ADA	ADA	Project completed FY2013-2014
Montpelier-Berlin	ADA	Yes	Yes	ADA	Yes	No	No	No	ADA	ADA	Project planned FY2022-2023 (Platform); Station and parking projects completed FY2017
Randolph	ADA	No	Yes	No	No	No	No	No	ADA	ADA	Project completed FY2013-2014
White River Junction	ADA	ADA	Yes	ADA	No	No	No	Yes	ADA	ADA	To be determined. State of Vermont responsible for Station, Platform, and Parking
Windsor-Mt. Ascutney	ADA	No	Yes	No	Yes	No	No	No	ADA	ADA	Project completed FY2019-2020
Claremont, NH	ADA	No	Yes	No	No	No	No	No	ADA	ADA	Project completed FY2019-2022
Bellows Falls	ADA	ADA	Yes	No	Yes	No	No	No	ADA	ADA	Project planned FY2022 (Structure)
Brattleboro	ADA	ADA	Yes	ADA	No	No	No	No	Yes	No	Project planned FY2022-2023 (Platform)

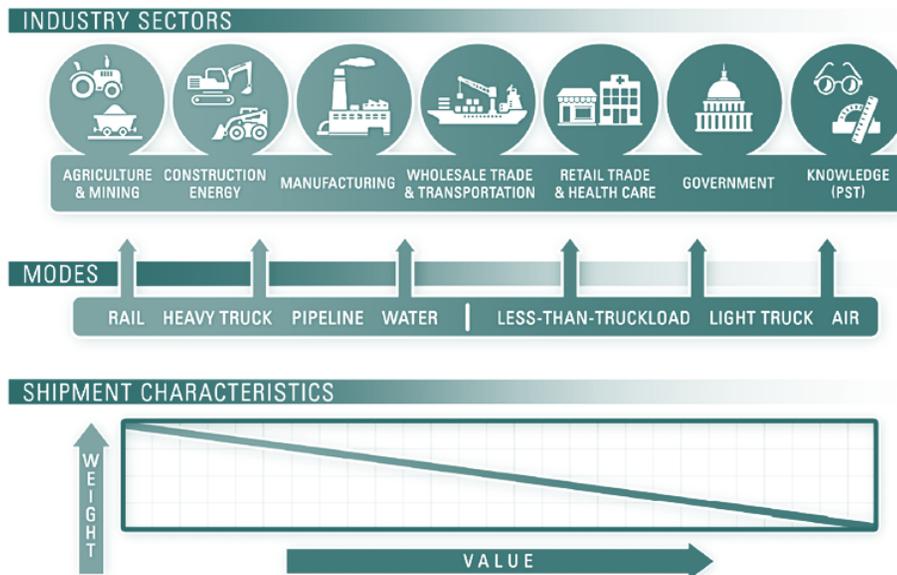
Source: Amtrak. ADA = Amenity is Americans with Disabilities Act accessible.

4.3 Freight Rail and Overall System Conditions

Freight rail offers an important option to businesses in Vermont, both providing competition to and supporting trucks to deliver goods.

Industries such as agriculture and mining, construction, energy, and manufacturing tend to rely more on rail and heavy trucks to move bulky, lower value goods. Intermodal rail service, which handles goods loaded in containers and truck trailers intact, can be used to transport virtually any commodity that can be moved in dry or refrigerated trailers. This relationship between modes and a number of economic sectors is shown in Figure 4.5.

FIGURE 4.5 COMMON FREIGHT MODES BY INDUSTRY SECTOR



Note: PST includes the professional, scientific, and technical services industry sectors.



Re-Route and Coordinate

Working with VRS, VTrans bought out the State’s fiscal responsibility for two rail bridges and just under a mile of track near Montpelier. This allowed the WACR to be re-routed to avoid two weight-limited bridges which would have cost the State over \$3 million to repair. This new routing will help support growing granite exports (see above photo) which are being used for construction projects throughout the United States.

The WACR right of way also hosts the Montpelier Recreation Path, a popular multi-use path which provides a safe, shared route for bicyclists and pedestrians in Montpelier.

Rail Lines/Operators

There are nearly 580 miles of active rail lines in Vermont, with just over 305 of those miles owned by the State. Most of these lines carry freight only. The New England Central (NECR) also carries the Vermonter. The Clarendon & Pittsford (CLP) also carries the *Ethan Allen Express*. The Vermont Railway (VTR) north of Rutland will host the extended *Ethan Allen Express*. In addition, the Green Mountain Railroad (GMRC) hosts seasonal tourist service. Table 4.2 provides an overview of these assets.

Railroads are classified by the amount of revenue they generate. There are seven Class I railroads in the U.S. which provide the greatest amount of service and over the largest territories, with many additional Class II “regional” and Class III “short line” railroads.^{xi}

TABLE 4.2 VERMONT ACTIVE FREIGHT RAIL LINES

Active Rail Line	Class	Ownership	Track Mileage
New England Central Railroad (NECR)	III	Private	190.9
Vermont Railway (VTR)	III	Public-State	139.8
Connecticut River Division (WACR)	III	Public-State	102.2
Green Mountain Railroad Corp (GMRC)	III	Public-State	50
St. Lawrence & Atlantic Railroad (SLR)	III	Private	30.7
Canadian Pacific (CP)	I	Private	24.4
Clarendon & Pittsford (CLP)	III	Private	17.9
Washington County Railroad (WACR)	III	Public-State	13.1
Pan Am Southern (PAS)	II	Private	6.3
Canadian National (CN)	I	Private	3.0
Total Active Mileage			578.3
Total Active Mileage Public-State Owned			305.1

These lines are mapped in Figure 4.6 and a brief description of each is provided on the following page. More details about each line are available in Tech Memo 1.



Class I Railroads

Annual Revenue in excess of \$504.8 million in 2019



Class II Railroads (a.k.a., “Regional” Railroads)

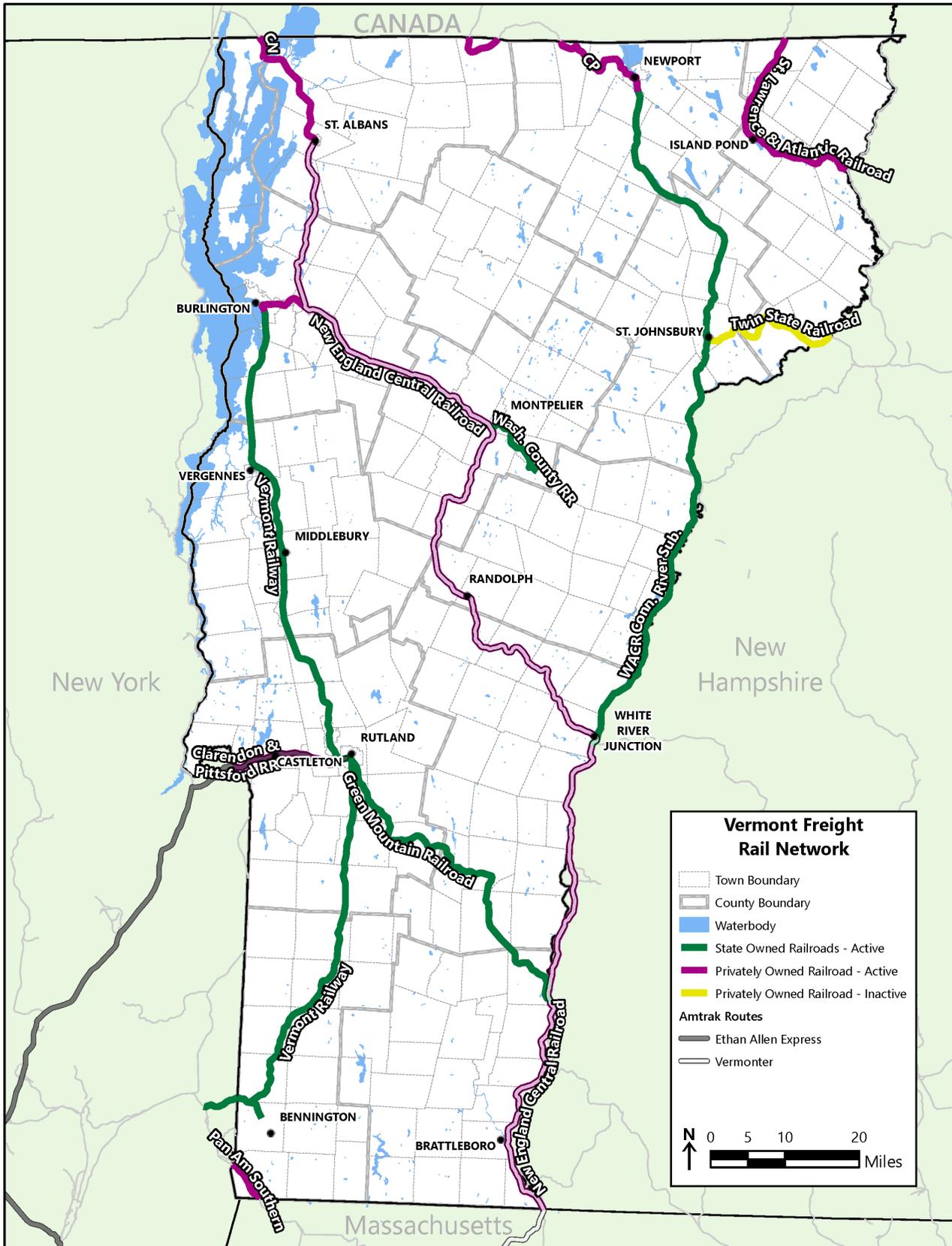
Annual Revenue between \$40.4 million and \$504.8 million in 2019



Class III Railroads (a.k.a., “Short Line” Railroads)

Annual Revenue less than \$40.4million in 2019

FIGURE 4.6 VERMONT FREIGHT RAIL NETWORK



Source: VHB, 2020.

- **Pan Am Southern (PAS)** – PAS began in 2009 as a joint venture between Pan Am Railways (PAR) and Norfolk Southern Railway Company. The full route is 286K capable, and seven miles are within Vermont near Pownal (see sidebar).
- **Canadian National (CN)** – CN, North America’s fifth largest railroad, operates an important 3 mile segment in Alburgh, VT linking the New England Central Railroad (see below) with CN’s Canadian rail network.
- **Vermont Rail Systems (VRS)** – Privately-owned, VRS’ operations in Vermont consist of five properties operating in a seamless fashion:
 - **Clarendon & Pittsford Railroad (CLP)** – CLP operates 18 miles of track between Rutland, Fairhaven, and Whitehall, New York. Owned by VRS, this line hosts Amtrak’s *Ethan Allen Express* service.
 - **Washington County Railroad (WACR)** – WACR runs through Montpelier, Berlin, and Barre between Montpelier Junction and the New England Central Railroad (see below).
 - **Connecticut River Subdivision of the WACR** - WACR also operates along the State-owned Connecticut River Division line from White River Jct., to Newport where it connects to CP.
 - **Green Mountain Railroad (GMRC)** – GMRC operates 50 miles of State-owned track between Rutland and Bellows Falls. GMRC connects to VTR and CLP in Rutland and with the NECR in Bellows Falls.
 - **Vermont Railway (VTR)** – Through a partnership dating back to 1964, VTR operates Vermont’s State-owned Western Corridor between Burlington, North Bennington, and Hoosick Junction, NY where it connects with PAS. At North Bennington, a spur goes to Bennington. VTR hosts Amtrak’s *Ethan Allen Express* at Rutland.
- **Canadian Pacific (CP)** – CP is the sixth largest Class I railroad by revenue. CP’s operations in Vermont consist of former CP trackage acquired from the Central Maine & Quebec Railroad in 2020. The 24 mile segment serving Vermont provides access to Brookport, Quebec and CP’s main line

Pan Am Railways Sale

The prospective sale of Pan Am Railways to Class I railroad CSX that was announced in November, 2020 will result in a consolidation of New England rail network ownership. This acquisition would cement CSX’ position as the largest railroad serving New England, bringing opportunity as well as risk to the region’s smaller carriers and rail customers. CSX would own the two primary routes linking New England with the rest of the US. It is in Vermont’s interest to ensure that this transaction maintain or improve marketable freight service by Vermont’s short line railways, and not negatively impact current and potential future intercity passenger rail services in the state.



Source: VHB

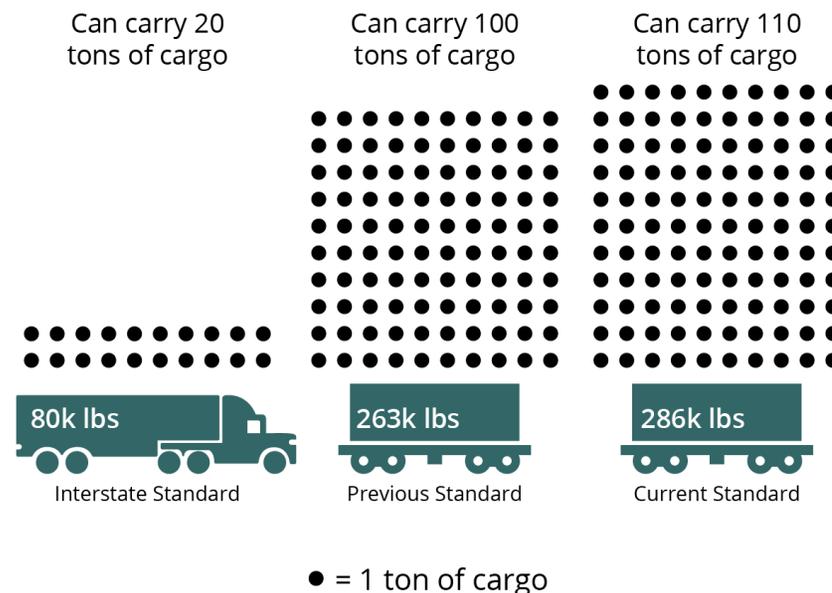
- between Montreal and Searsport, Maine. The line enters Vermont to serve Richford, re-enters Quebec, crosses back into Vermont near Troy, and thence terminates at Newport, where it connects with the Connecticut River Subdivision of the WACR.
- **Genesee and Wyoming (GW)** – A subsidiary of Brookfield Infrastructure and the world’s largest short line holding company, GW owns or leases 116 railroad properties located in North America, Europe, and Australia, of which 113 are based in North America. GW operates two railroads that are active in Vermont:
 - **New England Central Railroad Company (NECR)** – NECR operates throughout New England including 228 miles in Vermont that links Alburgh (connection to CN) and White River Junction to points south in Massachusetts and Connecticut. This line hosts Amtrak’s *Vermont* service between St. Albans and East Northfield, MA.
 - **St. Lawrence & Atlantic (SLR)** – SLR operates approximately 31 miles of track in northeast Vermont from Norton to North Stratford, NH connecting to CN in Richmond, QC and PAR in Auburn, ME.

Rail Network Conditions

Freight rail provides a number of advantages over trucks which are the other main freight mode in Vermont. First, **a single rail car can carry approximately four times the amount of weight carried by a truck** (see Figure 4.7). Cars weighing a total of 286,000 pounds are the national standard with some rail lines able to carry cars weighing up to 315,000 pounds. Cars carrying 263,000 pounds was the prior national standard until the early 2000s and many railroads in Vermont are limited to this weight. Second, **rail is on average four times more fuel-efficient than trucks, moving a ton of freight more than 470 miles on a gallon of fuel**—the distance from Burlington to Baltimore, MD.^{xii} Greenhouse gas (GHG) emissions are directly related to fuel

consumption, so moving goods by rail instead of truck lowers GHG emissions by up to 75 percent, on average.^{xiii}

FIGURE 4.7 CARGO WEIGHT CARRIED BY TRUCK AND RAIL



Source: FHI

The ability of Vermont companies to use rail to ship their goods depends on a number of factors including supply chain considerations, access to rail either on property or through a nearby facility which can move goods between rail and truck (transload), and the condition of the rail network itself. Six factors that impact the ability of the rail network to move freight are described briefly below. Additional information on these topics can be found in Tech Memo 1.

Weight Restrictions

The weight limits for Vermont’s rail network vary between 263,000 and 286,000 pounds (Table 4.3). This limit is based on both bridge and rail conditions. It should be noted that weight restrictions on a line located outside Vermont can limit weights in Vermont. For example, although the NECR in Vermont can carry 286,000 pound cars, the line is in reality limited to 263,000 pounds through Vermont due to weight limits in Massachusetts and on the CN line that it connects to in Alburgh.

Bridge Weight Capacity

A rail line’s weight limit is often due to bridges being unable to support heavier cars. All of Vermont’s bridges can handle 263,000 pound rail cars. However, of the 217 bridges on State-owned lines, 45 (21 percent) cannot carry 286,000 pound rail cars. The State is responsible for maintaining 27 of these structures as shown in Figure 4.8.

Rail Weight (115 Pound Rail)

In addition to limits imposed by bridges, track conditions—principally rail weight and tie conditions—can limit rail car weight. While trackage with light weight rail (typically under 105 pounds/yard) can accommodate 286k cars, it does so at increased operating and maintenance costs, as well as higher derailment risk, irrespective of whether the bridges could handle the heavier rolling stock or not. Over the past five years, this target has been met largely through work on the VTR. Approximately 34 miles of track between Proctor and South Burlington have been upgraded to 115 pounds since 2015, an average of more than six miles per year.^{xiv} However, sections of VTR track south of Rutland with less than 90 pound rail still pose problems for both freight and possible future passenger service from Albany to Rutland via Bennington. In addition, any work undertaken to improve bridges on the GMRC should also include rail work to allow for 286,000 pound cars as this

corridor provides an essential east-west alternative to the PAS route through southwest Vermont.

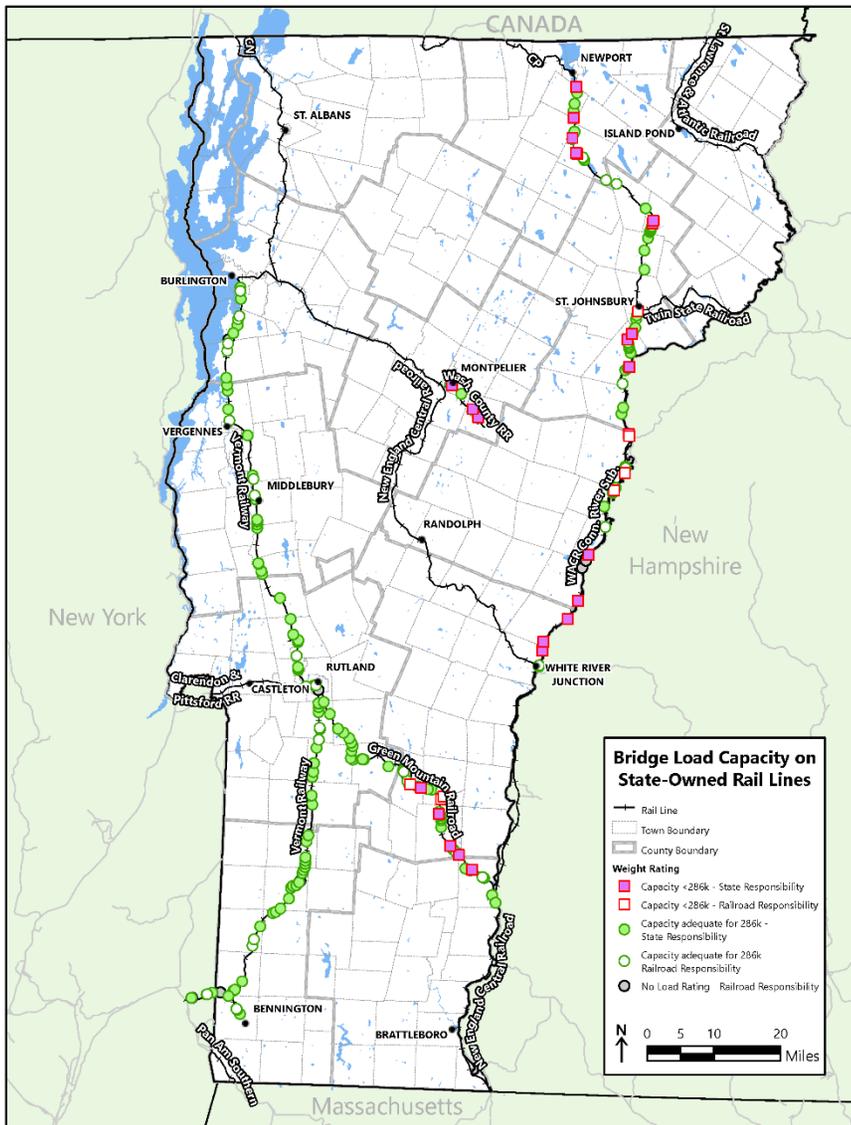
TABLE 4.3 VERMONT FREIGHT RAILROAD MAXIMUM CAR WEIGHT

Railroad	Maximum Railcar Weight (Pounds) in Vermont
New England Central Mainline	286,000
New England Central Burlington Branch	286,000
Canadian National	263,000
Clarendon & Pittsford	286,000
Green Mountain Railroad	263,000
Vermont Railway	286,000 (north of Rutland); 263,000 (south of Rutland)*
Washington County Railroad (M&B)	263,000
Washington County Railroad – Connecticut River Div.	263,000
St. Lawrence & Atlantic	286,000
Canadian Pacific	286,000
Pan Am Southern	286,000

Source: Rail company websites and interviews with VRS and Genesee and Wyoming, 2020.

*Note: VTR south of Rutland will be 286,000 pound capable pending completion of 2018 BUILD Grant related work

FIGURE 4.8 STATE-OWNED RAIL BRIDGE WEIGHT RESTRICTIONS



Source: VTrans; Analysis by VHB, 2020. Note that as of 2021, bridges on the VTR between Hoosick Junction, NY and Rutland, VT are being upgraded to allow 286,000 pound cars.

Vertical Clearances

The ability to move two containers stacked one on top of the other, known as “double-stack”, greatly improves the capacity of a train. The Association of American Railroads (AAR) has established a standard of 22 foot six inches for unrestricted rail operations, though most rail rolling stock requires less clearance.

There are numerous obstacles to unrestricted double-stack service, both within Vermont and in neighboring states and Canada. Table 4.4 shows vertical clearance restrictions in Vermont.

Given that the NECR is the only rail line that today handles double stack intermodal cars, increasing the clearances on this line is a logical first step. Currently, CN must reshuffle containers bound for Worcester, Massachusetts in Montreal to accommodate clearance limitations on the NECR and Providence & Worcester that prevent the operation of double-stacked domestic containers. Saving this step would allow for the NECR route to be more fully integrated into CN’s doublestack network, thereby offering the potential of a competitive intermodal option between southern New England and major Canadian and US trade centers.

Train Speed (FRA Track Class)

The Federal Railroad Administration (FRA) has established minimum track safety standards requirements and maintenance levels for train operators at given operating speeds. The lower the track class, the lower the allowable operating speed (see Table 4.5).

Most of Vermont’s rail lines are FRA Track Class 2 or 3, with the NECR south of White River Junction the only Class 4 segment in the State (see

Figure 4.9). There are also segments that are FRA Class 1 including the NECR Winooski Branch which connects Burlington to Essex Junction.

TABLE 4.4 VERMONT VERTICAL CLEARANCE RESTRICTIONS

Railroad	Obstructions to Unrestricted Double Stack Operations
NECR	Lowest clearance is 19'6" (US 5 in Hartland and US 7 in Georgia, VT). 14 total restrictions in Vermont
CLP	Lowest clearance is 19'2" in Rutland Center
VTR	17'8" clearances in Proctor, VT (projects in design phase)
GMRC	Lowest clearance is 19'2" in Proctorsville
WACR (Conn River)	Lowest clearance is 18'10" in Fairlee
PAS	None in Vermont. 23 total between Mechanicville, NY and Ayer, MA including the Hoosick River Bridge just west of the Pownal, VT border (bridge is in New York).
SLA	None
CN	None
CP	One clearance restriction

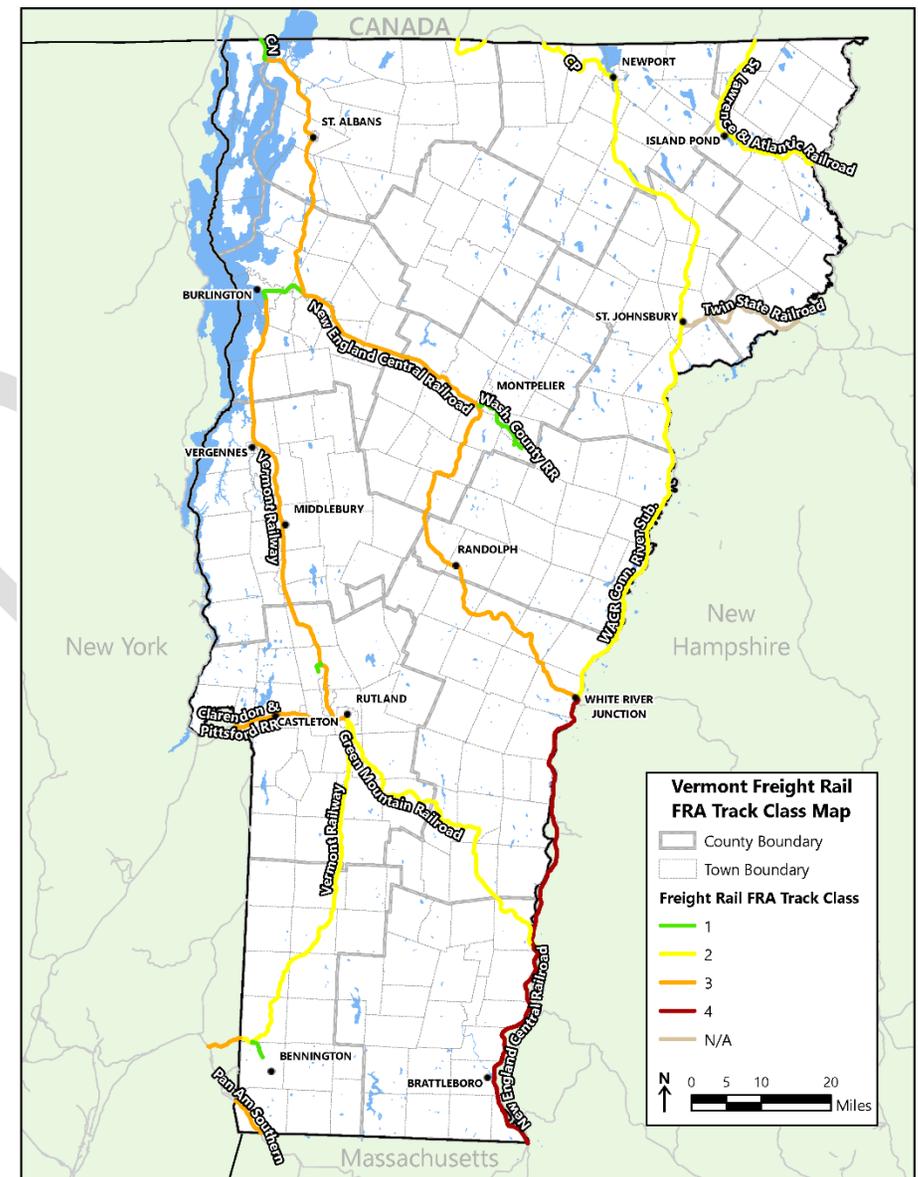
Source: Interviews with rail operators, 2020.

TABLE 4.5 FRA TRACK CLASS MAXIMUM SPEEDS

Track Class	Maximum Allowable Operating Speed (mph)	
	FREIGHT TRAINS	PASSENGER TRAINS
Excepted Track	10	Not Allowed
Class 1	10	15
Class 2	25	30
Class 3	40	60
Class 4	60	80
Class 5	80	90

Source: <https://www.govinfo.gov/content/pkg/CFR-2011-title49-vol4/pdf/CFR-2011-title49-vol4-part213.pdf>

FIGURE 4.9 FRA TRACK CLASS



Source: VTrans, Interviews with railroads. Analysis by VHB, 2020.

The State has set a performance target that all track carrying passenger service be, at minimum, FRA Class 4. To fully meet this, FRA Class 4 is needed on the remainder of the NECR north of White River Junction to St. Albans and eventually Montreal, as well as the Clarendon & Pittsford (CLP) and VTR north of Rutland to Burlington. This need would expand if additional passenger service beyond the extension of the *Ethan Allen Express* and *Vermont* is developed.

Although Track Class 4 allows for operating passenger trains at speeds of up to 79 miles per hour (MPH), actually achieving such speeds requires meeting additional conditions including, at minimum, appropriate track geometry and a signaling system. Other conditions will also affect maximum speeds, including civil works, visual sight lines, and mitigating right of way incursion risks.

Eliminate Permanent Slow Orders Along Passenger Routes

Slow orders (either temporary or permanent) are local speed restrictions that limit a train speeds on specific sections of track. Reasons for the restriction can vary. For example, some bridges may require trains to cross them at a lower speed than the surrounding track in order to reduce infrastructure degradation, or specific segments of track could have slow orders due to embankment erosion or recurring rock falls.

Vermont has a performance target to remove three such restrictions per year, with a priority on passenger routes. Over the last five years, this measure has been met through substantial work on the VTR (some of which was funded through federal grants), as well as preparing the GMRC to handle detours during the Middlebury tunnel construction project. Additional efforts are needed.^{xv} One area of particular concern is the VTR between Manchester and Rutland where track weights below 90 pounds limit speeds to 10 MPH.

Continuously Welded Rail Along All Passenger Routes

Another performance target is for all passenger rail routes in Vermont to be equipped with continuously welded rail (CWR). CWR entails the creation of continuous lengths of rail that may be several miles long. Advantages over conventional jointed rail include longer rail life, maintenance savings, reduced wear on equipment, and reduced noise.

The entire existing *Vermont* route has CWR, though there are segments on the NECR mainline that may need to be replaced to maintain a state of good repair. For the *Ethan Allen Express*, five of the CLP's 15 miles in Vermont needs to be upgraded to CWR. Sections of the VTR that will be used for the extension of the *Ethan Allen Express* to Burlington have been upgraded to CWR. For the *Vermont* extension to Montreal, approximately three miles of CN-owned track from Alburgh to the US/Canada border would need to be upgraded to CWR to meet this requirement.

Positive Train Control

As of 2021, none of Vermont's rail network is equipped with Positive Train Control (PTC), nor is it required under current federal regulation on the basis of freight traffic density, hazardous materials (HAZMAT) risk, and passenger train traffic. Thus far, PTC installations in the US have been overlays of existing lineside signaling and traffic control systems, which typically exceed \$1 million per mile where such systems are not extant. The implementation of lineside signaling along Vermont's passenger train routes would be costly, as the only locations where such a system currently exists is on PAS and the NECR between White River Junction and Brattleboro. However, initiatives are underway (as of 2021) to develop a "lightweight" version of PTC that will provide most or all of the safety and operational benefits associated with the technology, including the potential for passenger train speeds in excess of 60 mph, but with greatly simplified line-side hardware. As of 2021, Amtrak and

VRS are engaged in a pilot of this technology, which would form a building block for a comprehensive low-cost PTC solution.^{xvi}

Multimodal Connections

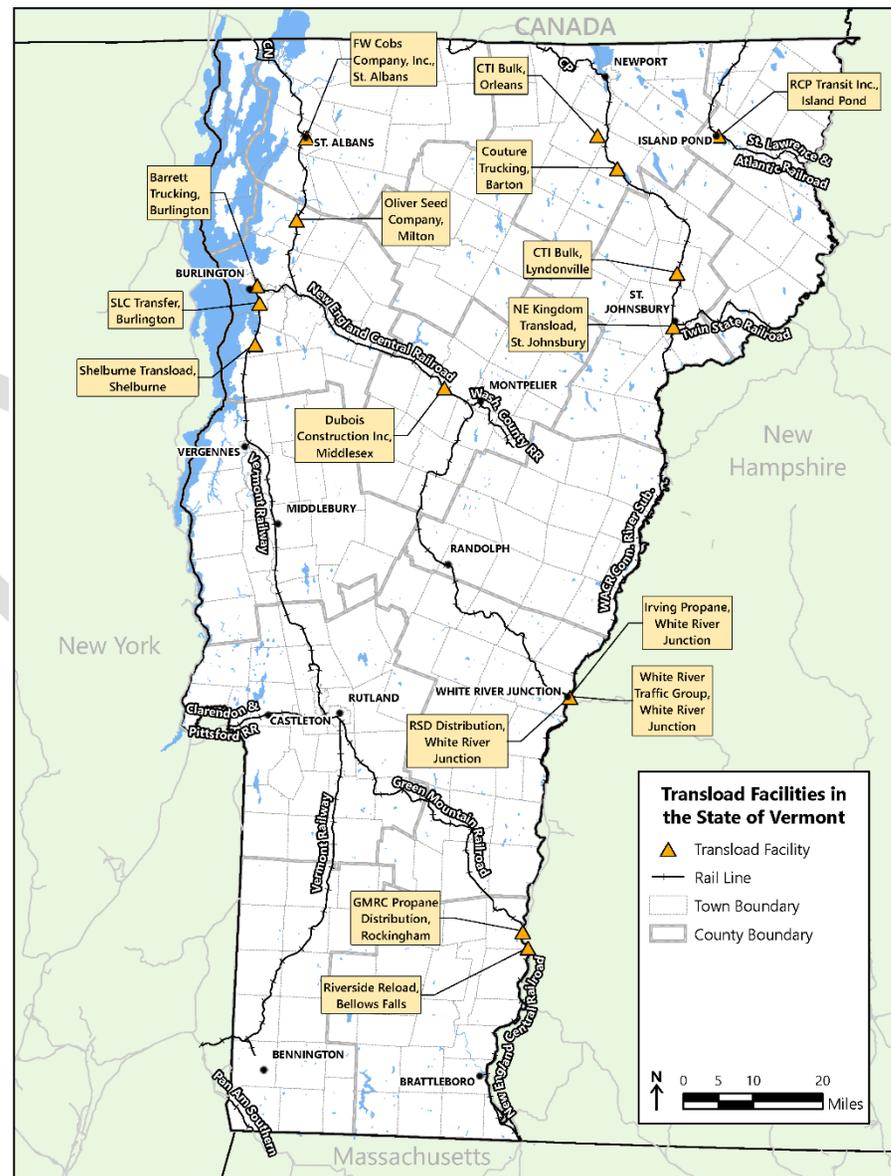
The ability to transfer freight between rail and other modes (chiefly truck) is an important part of the freight system. Trucks are often needed to move goods the “last mile” to and from freight facilities such as warehouses, stores, and manufacturing facilities. For rail-truck transfers, there are two common methods. First, **intermodal terminals** allow for the transfer between rail and truck of intact containers and trailers. These goods are transferred between modes without moving the contents from one vehicle to another, thereby increasing speed, reducing cost, and minimizing lading damage and loss. While there are no intermodal terminals located in Vermont, numerous facilities exist nearby in Massachusetts (Ayer, Worcester, West Springfield) and New York (Mechanicville), as well as Canada (Montreal).

Second, **transload facilities** provide locations for the transfer of non-containerized shipments between modes that can include rail, truck, water, and pipeline. This allows for a wide range of goods to be transferred, particularly bulk and break-bulk commodities where the risk of product loss and damage is modest. Such commodities include stone and building materials, lumber, and bulk food products. All of Vermont’s 16 transload facilities are operated by private customers. These facilities are shown in Figure 4.10.



Transload operation to move salt between rail and train. Source: VRS

FIGURE 4.10 VERMONT TRANSLOAD FACILITIES



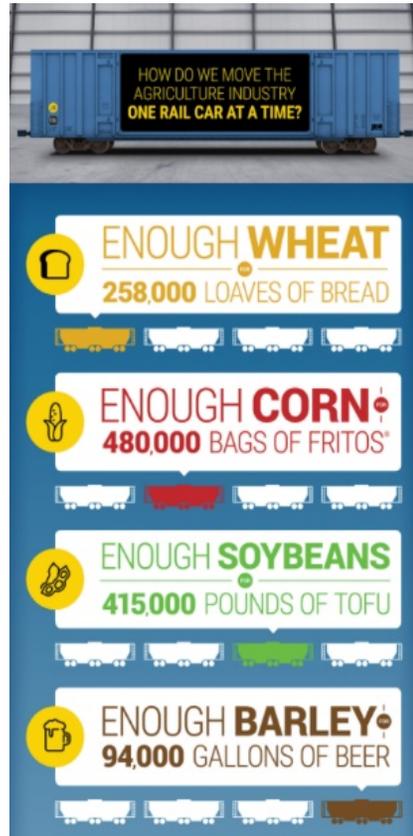
Source: http://www.vrs.us.com/vrs_connect/SLCtransfer.html; Interviews with railroads

Commodity Flow Overview

The rail system in Vermont carried 6.9 million tons in 2018, approximately 15 percent of the total tons shipped to, from, within, or through the State.

Truck accounts for most of the remainder (84 percent). This represents a 4 percent increase in total tons carried since 2011 and an 11 percent increase in the number of carloads, as shown in Figure 4.11.

Of the total rail tons, approximately 1.6 million tons (24 percent) arrived in Vermont from other states or North American countries an increase from 14 percent in 2011. 797,000 tons (12 percent) travelled from Vermont to other states or North American countries, and 435,000 tons (6 percent) traveled within Vermont. Through rail traffic accounted for 4.0 million tons or 58 percent of overall rail traffic, a decrease from 69 percent in 2011. Figure 4.12 shows the difference in freight by direction in 2011 (left) and 2018 (right).

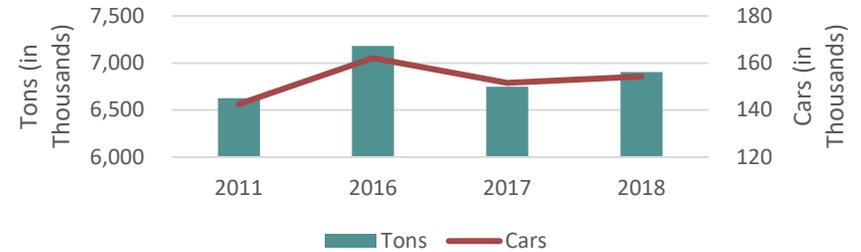


Source: AAR

Freight rail is an important part of the supply chain for Vermont businesses that extract, produce, and/or distribute construction materials, energy products, and food products. The top inbound rail freight commodities are petroleum and coal products, nonmetallic minerals, and food products, which together represent 80 percent of inbound rail freight tonnage. Nonmetallic minerals is the top

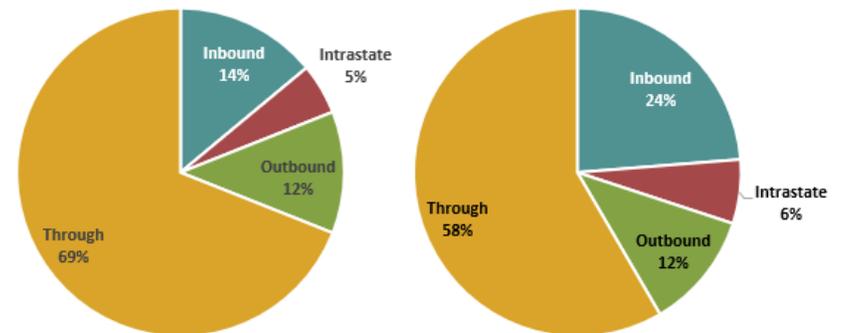
outbound rail freight commodity, accounting for 90 percent of outbound rail freight tonnage.

FIGURE 4.11 TONS AND CARLOADS, INBOUND, OUTBOUND, WITHIN, AND THROUGH VERMONT, BY YEAR



Source: STB Confidential Waybil Sample; Analysis by Cambridge Systematics, 2020.

FIGURE 4.12 VERMONT RAIL TONS MOVED BY DIRECTION IN 2011 (LEFT) AND 2018 (RIGHT)



Source: STB Confidential Waybil Sample; Analysis by Cambridge Systematics, 2020.

The majority of Vermont’s rail traffic was through traffic (58 percent or 4.0 million tons in 2018). **The PAS line that traverses the southwest corner of**

the State carries the majority of Vermont’s freight-rail through traffic (56 percent of all through traffic or 2.3 million tons). The remaining through traffic mostly traveled along the NECR from Canada in the northwest to interchanges with Massachusetts in the southeast corner of Vermont (1.1 million tons) or along the SLR in the northeast corner of the State (592,000 tons).

Outbound and inbound traffic is concentrated between Florence Junction and Rutland on VTR. Seventy-five percent of all outbound traffic travels on this segment, and 54 percent of all inbound traffic. **Intrastate traffic is concentrated on the NECR between its interchange with CN near the Canadian border and Burlington**—69 percent of intrastate traffic by tonnage uses these segments. The VTR segments between Rutland and Bellows Falls and Burlington and Rutland carry 25 percent and 29 percent of intrastate traffic, respectively.

Vermont’s top rail trading partners, in order, are New York, Canada, Maine, and the South Atlantic region. Trade with those regions accounted for 79 percent (1.9 million tons) of total inbound and outbound rail tonnage in 2018. New York accounted for the most trade, 34 percent (833,000 tons) or total inbound and outbound rail tonnage in 2018, and the vast majority (97 percent) of these flows was traffic arriving to Vermont from New York (inbound) and are mainly comprised of nonmetallic minerals such as rock salt, and to a lesser extent petroleum products and transportation equipment. Figure 4.14 on the following page shows these flows to and from Vermont.

According to the FHWA’s Freight Analysis Framework (FAF) 4.3, the volume of freight moved by rail in Vermont is expected to increase substantially between 2018 and 2045, driven in large part by increased volumes of construction materials (concrete, stone, lumber, etc.), and nondurable goods (paper, paper products, apparel, etc.). This information is shown in Figure 4.13.

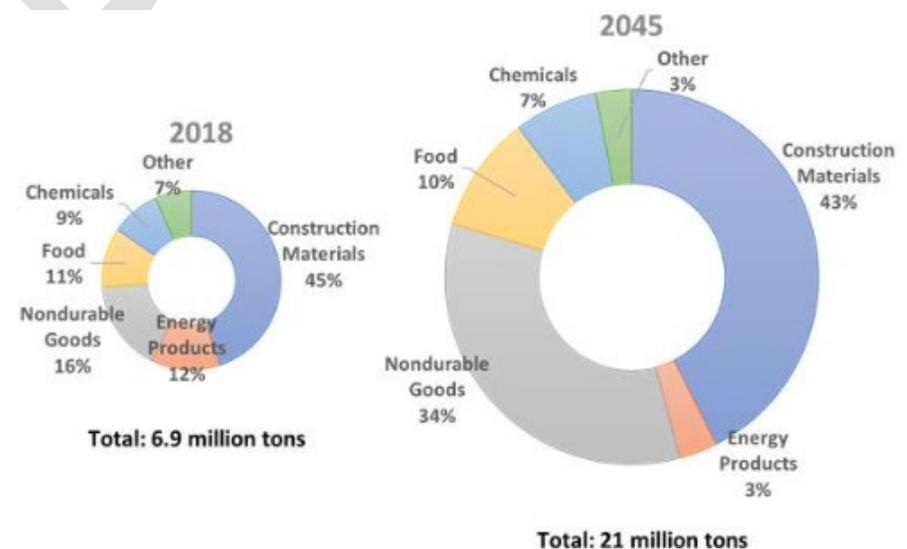
By 2045, New York and Maine are projected to account for 71 percent of traffic on a tonnage basis. This an increase in concentration from 2018, during which the two states accounted for only 46 percent of the total traffic by tons. New

York will continue to be the top trading partner in 2045 and Maine will come in a close third to Canada. Shipments to the South Atlantic region are expected to grow by 125 percent to 540,000 tons representing seven percent of the inbound and outbound trade.

This data is bolstered by **interviews with rail operators who indicate that business is steady and they see opportunities to continue to grow traffic with Vermont-based customers.** In particular they raised commodities such as granite tailings, wood pellets, and propane. These stakeholders also note that decreases in volume from COVID-19 are not anticipated to last and anticipate a return to pre-COVID-19 levels relatively quickly.^{xvii}

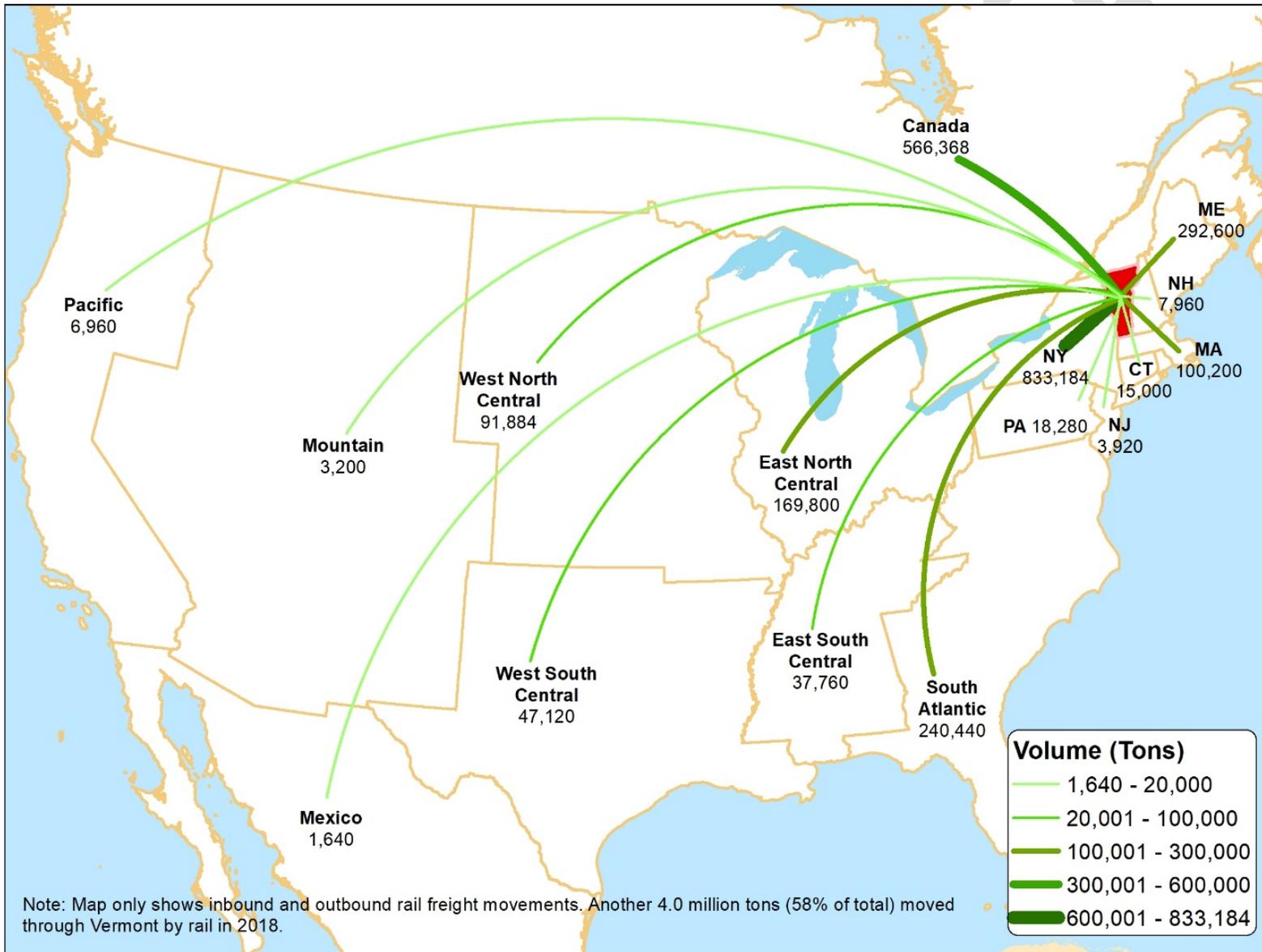
An extensive discussion of existing and future commodity flows are found in Tech Memo 3.

FIGURE 4.13 DISTRIBUTION OF RAIL COMMODITIES BY WEIGHT (2018 AND 2045)



Source: STB Confidential Waybill Sample; FAF4; Analysis by Cambridge Systematics, 2020.

FIGURE 4.14 VERMONT RAIL TRADING PARTNERS BY WEIGHT (2018)



Source: STB Confidential Waybill Sample; Analysis by Cambridge Systematics, 2020.

Freight Volume Associated with Vermont Industry

All of these freight system conditions impact the ability to move goods and into and out of the State. **With a target of 3.0 million tons moved into or out of the State from the 2015 Rail Plan, Vermont is just below this total at approximately 2.8 million tons.**^{xviii} That total is similar to 2017 totals (2.8 million tons) and has risen from 2.2 million tons in 2012.^{xix} **Commodity flow projections and stakeholder input both indicate that this volume is likely to continue to rise.**

Recruiting Rail-Using Businesses

A rail diversity analysis detailed in Tech Memo 2 noted that **Vermont's population of rail customers has grown and concentration of rail traffic among those customers has improved modestly since the early 2010s.** While user diversity has increased somewhat, there is room for additional improvement. Adding new outbound customers in particular would help the State diversify and meet the freight volume performance measure (discussed above) while also protecting against the probable erosion of the existing customer base. Note that attracting and retaining businesses, similar to the commodity flow discussion above, is heavily tied to and reliant on the physical condition of Vermont's rail network (see sidebar).

4.4 Rail Safety and Security

Rail safety and security is a high priority for both rail carriers and public agencies due to potential impacts on the general public and the efficiency of rail operations. **Rail safety in the State is led by VTrans' Rail Program unit and the Vermont Department of Public Safety's Vermont Emergency Management Office acts as the State's lead agency for emergency response.** This agency, with the assistance of VTrans, addresses security and emergency response issues related to rail within the State. Federal and Vermont agencies,

Northeast Materials

Northeast Materials in Barre employs approximately 15 people and ships rock/stone products from the Rock of Ages quarry. Since 2012, the company has used the WACR M&B to ship large pieces of granite to Army Corps of Engineers breakwater projects on the Great Lakes. The company works with VRS when bidding on these projects and without the WACR would not be able to compete for this business, as moving the granite by truck is not cost-competitive.

Growth opportunities for the company include additional marine projects along the East Coast as well as the potential to ship aggregate (used in concrete and asphalt) to large metropolitan regions in the northeast where traditional sources of this material are getting low. Improving the WACR to allow for 286,000 pound cars will improve their ability to successfully bid on future projects.



Source: northeastmg.com

along with the State’s rail operators, continue to make progress with regard to rail safety and security. **As railroads are engaged in interstate commerce, their regulation is principally conducted at a federal level.** Thus, they are generally exempt from local regulations for activities directly related to their transportation function, such as train operations and maintenance activities that occur within the rail right-of-way,

Reportable rail incidents including all injuries and deaths which occur as part of a collision with a train at a grade crossing, train accidents and collisions, and trespassing incidents over the last ten years (2010-2019) are summarized in Table 4.6. Incidents which involve only a vehicle but occur near a crossing (eg, hitting infrastructure at the crossing) are not included.

Total incidents in Vermont have remained relatively low but have seen a small increase over the 10-year period while train incidents and highway-rail incidents have remained fairly steady. The spike in train incident injuries in 2015 is largely attributable to an October incident when a *Vermonter* train traveling southbound in Northfield derailed after striking rocks on the track due to a rock slide, injuring four passengers and three crew members.^{xx} In total, incidents in Vermont represent between 0.2 and 0.3 percent of all incidents in the U.S. with a slight spike in 2015 due to the incident noted above.

Comparing the total number of incidents between 2010 and 2019 to the total miles of track in Vermont, New Hampshire, Massachusetts, New York, and nationally, Vermont’s rate of 0.46 incidents per mile of track is 2nd lowest to New Hampshire (0.11), with both Massachusetts (1.98) and New York (4.03) substantially higher. Nationally, the total incidents per mile of track over this period was 0.83.^{xxi}

Operation Lifesaver is a key actor in trying to prevent these incidents. The program coordinates a nationwide network of volunteers to educate people

about rail safety. Through partnerships with federal transportation agencies, national transportation organizations, railroads, and safety engineering and rail supply, Operation Lifesaver provides free presentations to a variety of school, business, and civic organizations. In addition, Vermont provides funding for specialized grade crossing collision investigation courses which are design to help officers more effectively investigate incidents.^{xxii}

TABLE 4.6 FRA REPORTABLE RAILROAD INCIDENTS 2010 – 2019 IN VERMONT

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Incidents	20	19	21	26	29	34	32	32	28	30
Deaths	1	0	1	2	1	5	1	1	0	2
Injuries	15	17	18	21	26	40	28	24	22	22
Train Incidents	3	1	1	1	2	3	0	3	3	4
Deaths	0	0	0	0	0	0	0	0	0	0
Injuries	0	0	0	0	0	13	0	0	0	0
Highway-Rail Incidents	4	3	2	4	2	1	4	6	4	6
Deaths	1	0	1	0	0	0	0	1	0	2
Injuries	2	2	0	2	2	0	1	1	1	2
Other Incidents	13	15	18	21	25	30	28	23	21	20
Deaths	0	0	0	2	1	5	1	0	0	0
Injuries	13	15	18	19	24	27	27	23	21	20

Source: FRA Office of Safety Analysis, 10-Year Accident/Incident Overview. Retrieved June 18, 2020.

At-Grade Crossing Protection

Rail grade crossing incidents have the most visibility to the public and can slow movement of goods and people on both the rail and highway networks. Between 2015 and 2019, there have been 21 incidents at highway-rail grade crossings resulting in three deaths and five injuries.

Various types of protection are currently used to control the interaction and awareness between rail and non-rail traffic at Vermont's more than 400 public at-grade rail crossings.

Vermont established a long-term goal in the 2015 Rail Plan of protecting all public highway-rail grade crossings on passenger rail routes with flashing lights and gates. It is important to note that there are also many private at-grade crossings where safety concerns may arise. Identifying and addressing safety issues at private crossings can be complicated by the need to identify and develop consensus between the various responsible parties, which include private property owners, the railroads, and in some cases, VTrans.

The VTrans Section 130 Railroad-Highway Crossing Program was recently reviewed by the Federal Highway Administration (FHWA) Vermont Division Office to ensure compliance with applicable Federal requirements. As a result of the program review, **VTrans has developed an Action Plan to address the recommendations and assigned a team to develop and enact a clear VTrans policy for Railroad-Highway Crossing Projects.** The policy will identify a clear and documented Section 130 Prioritization Process, provide guidance for Non-130 Federal-Aid Projects containing Railroad-Highway crossings, provide clear guidance for developing the appropriate scope of work for both surface treatment and safety devices, and a clear process for when and how to use a Diagnostic Field Review. The new policy is expected to be in place during the summer of 2021.

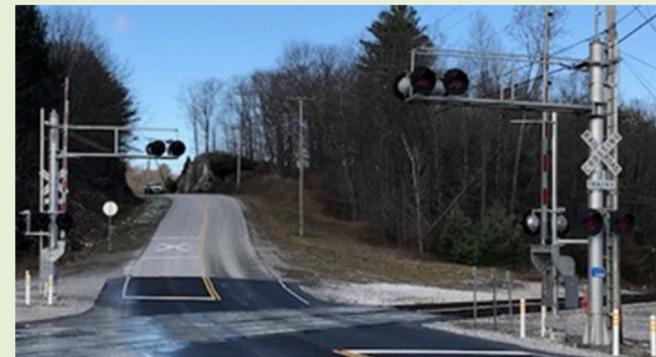
Quiet Zones

Quiet zones are designated stretches of track where the sounding of train horns while approaching public crossings is not necessary. This greatly reduces the aural impact of both freight and passenger rail activities on nearby residents, especially on active rail lines or lines that see substantial use during the night when noise can be particularly disruptive. Crossings in Quiet Zones often require additional safety improvements such as gates with channelization or medians, four-quadrant gates, one-way streets, and crossing closures.^{xxiii}

At-Grade Rail Crossing Safety

The picture below showcases an innovative grade crossing solution completed in 2020 on Kendall Hill Road in Pittsford. This crossing is at the bottom of a hill and the road carries a higher-than-average percent of trucks, and the decline can require hard braking for trucks.

This project included the installation of a warning sign at the top of the hill linked to the crossing. The sign reads "Train when flashing" and two lights that activate when a train approaches the crossing. Trucks can see the sign prior to the actual crossing, allowing them additional time to begin braking, reducing the risk of them encroaching into the crossing.



Resiliency/Climate Change

Rail resiliency can take many forms. First, Vermont's rail network is part of a larger regional and national system. By ensuring routes in Vermont are at national standards for size and weight and are maintained and improved to reduce the potential impacts of climate change (such as more frequent and severe storms), the rail network provides alternatives for both the highway and regional rail system in the event that emergency conditions impact regular routes. The closure of the Hoosac Tunnel in the spring of 2020 (see sidebar on following page) as well as impacts from prior storms such as Tropical Storm Irene in August 2011 make this need clear. Additional resiliency issues are more unique to Vermont (see sidebar on right) and pose a challenge for rail infrastructure that is not hardened to prepare for changing conditions.

Resiliency planning is now part of the State's LRTP through Objective 1.5: "Improve the resilience of the transportation system."^{xxiv} The Vermont Transportation Resilience Planning Tool (TRPT) is one outcome from this focus on resiliency.^{xxv} This tool allows Vermont to quantify the flood vulnerability and risk to State and town highways and structures as well as considerations of how critical the road segment is to transportation based on relative travel time impact. However, rail infrastructure is not similarly rated.

Figure 4.15 provides a high-level analysis of where rail lines are within flood risk areas based on three data sources.^{xxvi} **Of the 578 miles of track in Vermont, approximately 109 miles of State-owned line and 71 miles of privately owned rail lines (180 miles total or 30%) are at risk of inundation.** This includes much of the NECR, the VTR south of Middlebury, and sections of the GMRC.



Source: Google Maps

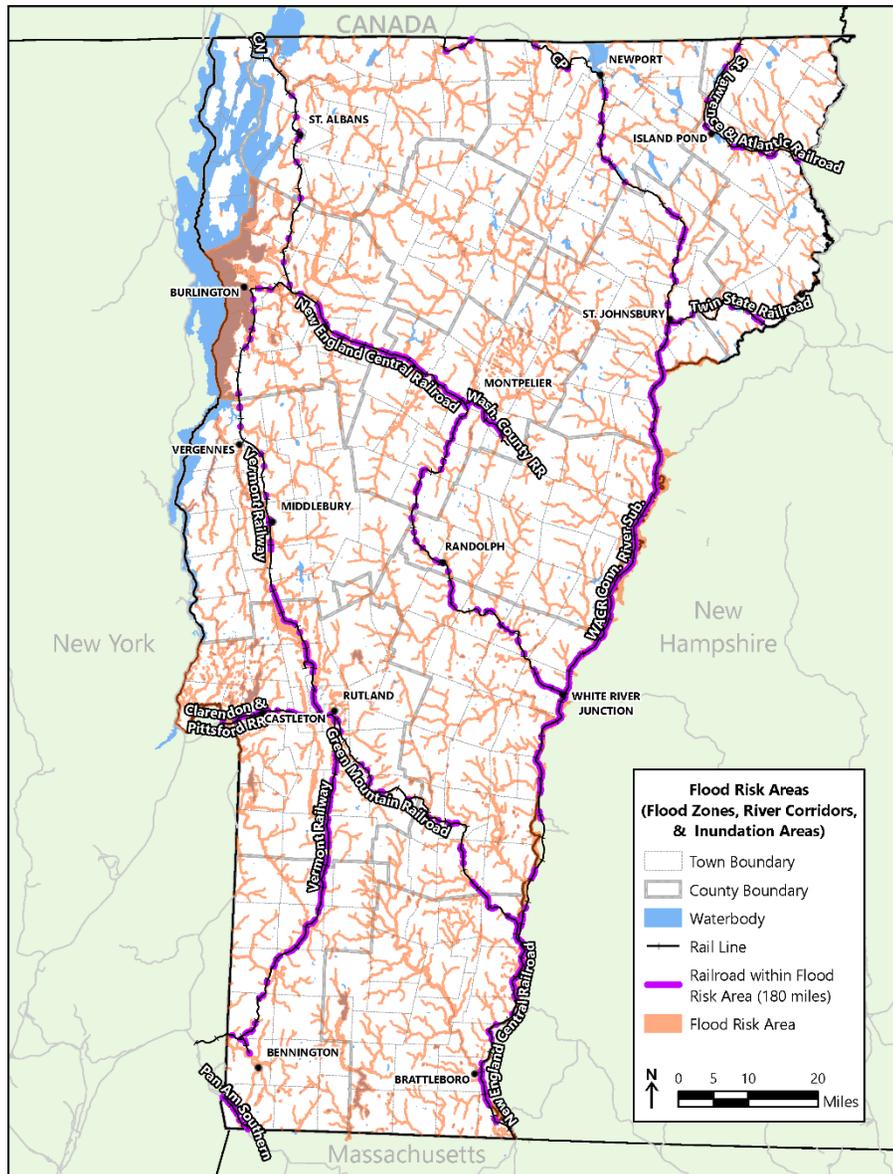
Rail Resiliency in Vermont

Improving rail resiliency includes hardening infrastructure to better adapt to changing conditions. In the below photo, beaver dams outside of local road right of way are blocking a culvert under the GMRC in Rockingham near the Bartonville Covered Bridge (above), causing flooding during heavy rain or snow melt. This flooding could impact rail infrastructure which carries propane tank cars, a concern for residents and the environment



Source: Susan Hammond

FIGURE 4.15 RAIL FLOOD RISK VULNERABILITY



Source: VTrans.⁵

Hoosac Tunnel Collapse & Detour

The 4.75-mile Hoosac Tunnel near North Adams, MA is part of the PAS Patriot Corridor between Mechanicville, NY and Ayer, MA. The PAS carried approximately 2.3 million tons of rail-freight through Vermont in 2018 (56% of all through traffic) to the benefit of the New England region by the availability of competitive rail service, lowering freight transportation costs, and reducing the volume of trucks on the region's highway network.

The tunnel suffered a partial collapse on February 12, 2020, stopping traffic on the PAS. The value of a resilient rail network was quickly demonstrated with the establishment of a detour route using the VTR from Hoosick Junction to Rutland, GMRC to Bellows Falls, and thence NECR back to PAS at Millers Falls, MA. This detour route helped keep freight moving until the tunnel re-opened in early April, 2020.

However, a 263,000 pound weight limit on the GMRC limited shipments that could utilize this routing, resulting in more circuitous rail diversions as well as the loss of some rail shipments to truck.



Source: News10.com

Hazardous Material Movement

Hazardous materials (HAZMAT) range from mild environmental hazards—large milk spills into water are potentially hazardous—to more potentially harmful substances including petrochemical products and ignitable, toxic, or corrosive materials. Vermonters rely on access to these materials to heat our homes, make our water safe to drink, and fertilize crops, but we also want them transported safely. **Trains are a safe way to transport such substances, with more than 99.99% delivered safely.**^{xxvii}

However, an incident such as the 2007 derailment of 18 cars carrying gasoline in Middlebury can have lasting impacts.^{xxviii} Storage of rail cars containing fuel are naturally of concern particularly when they are parked near residential areas or environmentally sensitive areas such as water bodies.

The winter of 2018/2019 was severe and trains transporting fuel to Vermont could not get through to keep up with Vermont's heating oil needs. Schools and other facilities had to shut down. Fuel distributors now store fuel in railcars for the winter to avoid a repeat. (Ike Bendavid. WCAX3. January 7, 2019).

While some parallel concerns fall into local or State jurisdiction, **railroads operating within their right of way are governed by federal rules, limiting the ability of State and local authorities to require changes.**^{xxix}

Petroleum or coal products accounted for approximately 12 percent of the total rail tonnage moving in the State in 2018. Although this total is projected to decrease slightly through 2045, railcars carrying these substances will continue to be a significant part of the traffic mix.

The operating railroad is the first entity involved if there is a HAZMAT spill. They engage with other entities such as Vermont Emergency Management

(VEM), Vermont Department of Environmental Conservation's Hazardous Waste Management Program, VTrans, local fire departments, and others. Continued communication among these groups can ensure safety precautions, protocols, and incident response plans remain up-to-date and effective.

VRS purchased and pre-positioned substantial quantities of fire fighting foam at locations throughout the state: White River Junction, Burlington, St. Johnsbury and Rutland. The fire fighting foam is made available to local fire departments and Vermont Emergency Management at no cost to the State or local community, and allows for faster and more effective fire fighting response in the event of an incident of any kind.

Railroad companies in Vermont hold trainings for first responders and others. There are also trainings and information available from national organizations such as Transportation Community Awareness and Emergency Response (TRANSCAER). State agencies can help further publicize training and share municipal best practices within the State, such as how Hartford integrated Tier II data into its 911 system to better support local first responders. Occasional public HAZMAT training opportunities are published on the [Vermont Emergency Management](#) (VEM), [Transportation Community Awareness and Emergency Response \(TRANSCAER\)](#), and [Vermont Hazardous Materials Response Team](#) websites.

Vermont has a dedicated HAZMAT response team which deploys at the request of local jurisdictions and others such as railroads. Vermont is also transitioning from county-based Local Emergency Planning Committees (LEPC) to a single Statewide LEPC which will provide consistent focus, enhanced compliance with federal statutes, and improved engagement with managers and operators of HAZMAT storage sites and commercial users.

Additional information on Vermont’s safety and security programs, including HAZMAT and safety inspections, is found in Tech Memo 1 and Tech Memo 3.

Construction Activities

Staging and temporary storage of rail-related construction material to support construction projects is also a concern when there are real or perceived risks to health and safety, particularly in residential areas. While railroads have no requirement to respond to community concerns, they may do so as part of a long-term positive position. This could include enhanced communication to the local public and/or alternative storage or staging plans.

4.5 Economic Development and Land Use

Land use and development span both freight and passenger rail topics. Passenger rail can contribute to healthier communities by acting as a hub for mixed-use environments that promote walking, biking, and transit, as well as contribute to economic vitality by providing destinations for visitors to the area. It can also help meet the State’s land use goal of maintaining historical settlement patterns with compact centers surrounded by rural countryside by providing additional transportation options, thereby limiting growth in vehicle miles traveled (VMT).^{xxx}

Improving bicycle/pedestrian and transit connections (including scheduling of connecting transit services) can help boost ridership.

Potential locations to examine for enhancing connectivity include a connection from the new Vergennes/Ferrisburgh station to Vergennes along Route 22A and in Castleton between the Amtrak Station and the Marble Valley Regional Transit District Fair Haven Route bus stop which are approximately 0.3 miles apart. These efforts, combined with opportunities to explore transit-oriented development (TOD) can help ensure that downtowns in small communities continue to thrive.

Freight-generating land uses such as agriculture, natural resources and mining, construction, warehousing, and manufacturing can bring many benefits to a region, including: employment associated with freight activity; business and income tax benefits to local, regional, and state economies; additional economic output; and lower costs for goods and services. However, freight-generating industries can also produce undesirable impacts, such as noise, vibration, odor, light pollution, and air quality issues—though some impacts can be minimized through communication, technology, and responsive management. It helps in the long run to work toward a thoughtful balance between economic activity and undesirable impacts.

Throughout the State, there is a general acknowledgment by the RPCs that future industrial uses should be located near related developed areas with easy access to existing highways and railroads. One need is to ensure the continued availability of properties suitable for rail-oriented development. **Once a rail-accessible property has been developed for other uses it becomes very difficult to restore its valuable potential for multimodal industry.**

An initial step would be an updated inventory of properties that are or could be served by rail while at the same time working with the railroads to identify and maintain sidings that do or could serve freight-generators. The Agency of Commerce and Community Development (ACCD) maintains a Commercial/Industrial site locator tool with a sampling of properties that could be part of publicizing priority parcels.^{xxx}^{xi} Some RPCs have developed such inventories in the past (Rutland in 2005,^{xxx}^{xii} Southern Windsor County RPC in 2007^{xxx}^{xiii}) but they are out of date. VTrans and RPCs have started exploring a results-oriented update (See) as a optional Transportation Planning Initiative-funded task for the future. Additional information related to land use and economic development needs can be found in Tech Memos 1, 2, and 3.

5.0 NEEDS AND ISSUES

Needs and issues were identified through stakeholder input, analysis of existing conditions and projected future trends such as changes in commodity types (separate from the passenger rail modeling discussed in Section 7.1), and an assessment of the State’s progress toward meeting rail performance targets.

5.1 Performance Measures

Performance measures and associated performance targets are a way to set quantitative goals and measure success in reaching them. They are a valuable way to organize the analysis of existing conditions and identify gaps and needs. They can also be used to report performance to rail stakeholders and the public in a concrete and easily-understood manner.

This plan carries forward the 12 performance measures established in the 2015 Rail Plan. These measures span three categories as shown in **Error! Reference source not found.** System effectiveness measures use of the rail system by passengers and freight. System condition measures infrastructure conditions. System initiative measures track longer-term progress on system-wide goals. These measures are in addition to the required national PRIIA Amtrak measures discussed in Section 4.2.

Progress towards achieving these targets provides another way to identify the needs and issues facing Vermont’s rail system. Vermont is meeting most of the performance targets. Vermont is close to meeting other targets, for example, although the volume of freight moved into and out of Vermont does not meet the target, they are close and projected to continue the positive trajectory seen over the last decade.

Additional information on these topics can be found in Tech Memo 3.

TABLE 5.1 PERFORMANCE MEASURE STATUS, AS OF JANUARY 2021

Category	Performance Measure	Target	Status
System Effectiveness	Freight rail volume originating and terminating in Vermont	3 million tons	Not being met
	Recruit new rail-using businesses	2 businesses per year	Being met
	Passenger trips in Vermont	5% increase	Not being met
	FRA PRIIA performance and service quality indicators	Above national average in half or more reporting categories	Partially being met
System Condition	Bridges meeting 263,000 pound standard	All State-owned bridges	Being met
	Bridges meeting 286,000 pound standard	Improve 3 or more annually	Being met
	Rehabilitate and upgrade rail crossings	Improve 3 or more annually	Being met
	115 pound rail	5 miles annually	Being met
System Initiatives	Eliminate permanent slow orders along passenger routes	3 per year	Being met
	Continuously welded rail along all passenger routes	Continuously welded rail along all current and future routes	Not being met
	Vertical clearances	Remove all obstructions to allow unrestricted double stack operations	Not being met
	Minimum FRA Track Class 4 for all passenger routes	Class 4 operating speeds along all current and planned routes	Not being met

Amtrak/PRIIA Section 207 Performance

While ridership is the most commonly used measure of passenger rail performance, PRIIA Section 207 requires that Amtrak report additional performance metrics for train routes so that Amtrak, elected officials, and other policy makers may work together to improve the national passenger rail network.^{xxxiv}

Table 5.2 shows the summarized results for the two services in Vermont. The latest information, including current and past Section 207 reports, is available from the FRA Rail Service Metrics and Performance website.^{xxxv}

Neither service met all PRIIA-defined goals over between Q4 FY2019 and Q3 FY2020, with continuous financial improvement being a concern for the Ethan Allen Express and delay a concern for the Vermonter. Both routes received mixed customer service indicator scores, with on-board food service scoring lowest of the categories monitored.

Amtrak train delays can be attributed to a number of factors including the host railroad and Amtrak itself with causes ranging from conflicting train operations to maintenance work, large-scale construction projects, passenger-loading delays, and mechanical problems. On-time performance (OTP) and delay also affect the performance of other metrics. For example, trains that do not run on time are more likely to see reduced ridership, have lower customer satisfaction scores, and incur higher operating expenses.

Amtrak defines OTP as the total number of trains arriving on-time at a station divided by the total number of trains operated on that route. A train is considered on-time if it arrives at the final destination within an allowed number of minutes, or tolerance, of its scheduled arrival time. Additional details on PRIIA measures can be found in Tech Memo 3.

TABLE 5.2 VERMONT AND ETHAN ALLEN EXPRESS PRIIA SECTION 207 PERFORMANCE

Category	Metric	Met PRIIA Goal (Vermont)?	Met PRIIA Goal (Ethan Allen Express)?
Financial	Percentage of operating costs recovered by passenger related revenue (last 8 quarters)	Yes	No
	Passengers per train mile (last 8 quarters)	Yes	No
On-Time Performance (OTP)	Change in effective speed from FFY2008 baseline (MPH)	Yes	Yes
	End point on time performance	Yes	Yes
	All stations OTP	No (Q4 FY 2018-Q3 FY 2019)	Yes (Q4 FY 2018-Q3 FY 2019)
Train Delays	Host Responsible Delays – minutes per 10,000 train miles (by each host railroad)	No (includes MADOT, Metro-North RR, and NECR)	Yes for Amtrak, CP, and VTR; No for Metro-North RR
	Amtrak Responsible Delays – minutes per 10,000 train miles for off-NEC corridors	No	Yes
	Amtrak Responsible Delays – minutes per 10,000 train miles for the NEC	Yes	Not applicable
Customer Service Indicators	Overall Service	No	Yes
	Amtrak personnel	Yes	Yes
	Information given	No	No
	On-board comfort	Yes	Yes
	On-board cleanliness	No	No
	On-board food services	No	No

Source: <https://railroads.dot.gov/passenger-rail/amtrak/rail-service-metrics-and-performance-reports>

5.2 Key Needs and Issues

Key takeaways that inform needs and issues are summarized below. There is additional information in Tech Memo 3.



VTrans, in partnership with the State's railroads, has made significant gains in securing the long-term vitality of Vermont's rail network through continued investments. Most notably, this includes improvements along the entire western corridor, from the ongoing bridge program between Hoosick Jct. (New York), and Rutland, to the substantial upgrades in track and structures north to Burlington, including the recent construction of a new tunnel through Middlebury.



Investments have increased modal options for shippers and improved resilience for New England's rail network. This was evident during the closure of the Hoosac Tunnel in Massachusetts and associated detours in the spring of 2020. **It also demonstrated the need to complete the upgrade of the State's main line trackage to accommodate 286,000 pound railcars,** when certain detour traffic could not be handled on the east-west GMRC between Rutland and Bellows Falls.



The New England railroad system continues to be dynamic as shown by the acquisition of the CMQ by CP in early 2020 and the prospective sale of Pan Am Railways to CSX that was announced in November 2020. **Maintaining and improving access to regional short-haul markets and competitive Class I connections is vital.** This access supports Vermont businesses, the Northeastern US, and Canada.



Amtrak ridership in Vermont has been relatively steady at around 95,000 riders annually. Low fuel costs and delays due to construction in Massachusetts and Connecticut may have negatively impacted ridership over the past five years. The increase in speed and reliability following this work should help. **Shared, concerted effort is needed to increase Vermont's ridership numbers.**



COVID-19 led to suspension of Amtrak service in Vermont on March 26, 2020. The potential impacts of this on future ridership are extremely difficult to predict and have led to the development of multiple scenarios within the rail passenger forecasting update for this Plan. **Careful planning and marketing will be needed as service resumes.**



Vermont's overall population has been basically steady over the past decade. However, there have been internal shifts with growth in the Burlington metro area and a drop in overall population in other counties. Anecdotal evidence suggests some population gain in smaller towns throughout Vermont as urban residents from major metropolitan areas relocate due to COVID-19. **The broader effects of the pandemic need to be studied and responded to in a range of ways.**



COVID-19 also slowed freight rail volumes during 2020 but most rail stakeholders indicate that volume has almost returned to pre-COVID-19 levels, limiting the long-term impact on freight rail.



From 2011 through 2018, overall freight rail tonnage associated with Vermont has increased, a trend that is expected to continue. Much of that growth was associated with deliveries to customers in Vermont. Major commodities include clay, concrete, glass and stone and non-metallic minerals. **Growth in tonnage shipped is positive but calls for planning on how to accommodate additional demand and recruit new rail customers.**



There has been some healthy increase in diversity of industries using freight rail in Vermont since the early-2010's. The number of customers actively using rail to handle inbound and/or outbound shipments has increased modestly since 2014 to around 60, though traffic remains concentrated. **Protecting and marketing existing rail spurs and appropriately zoned land with rail access is necessary to provide options for new or expanding rail-serviced businesses in Vermont.**



Projected rising fuel costs and concern about environmental impacts of fossil fuels will continue to drive a need for cleaner, lower-emission

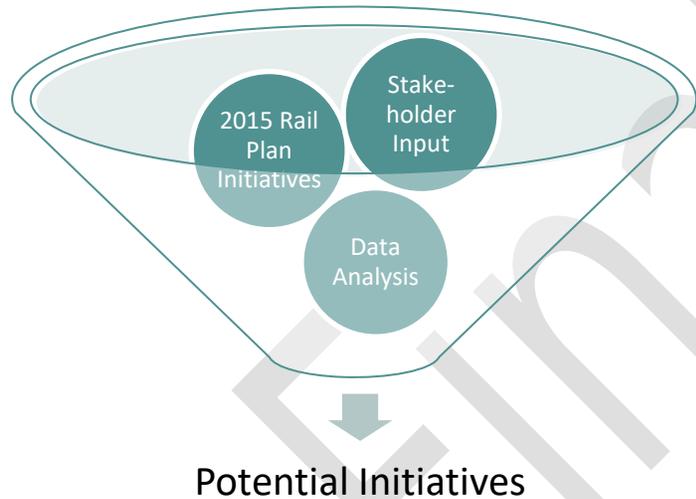
transportation modes. **Rail can continue to play a positive role in meeting Vermont’s fuel efficiency and GHG reduction goals.**

6.0 POTENTIAL INITIATIVES

To address needs and issues, a set of potential initiatives was developed. **Potential initiatives are the range of actions that would support and enhance intercity passenger rail and freight rail in Vermont. These initiatives could be advanced by any of a variety of agencies, municipalities, or other stakeholders in addition to VTrans.**

Initiatives were drawn from three sources (Figure 6.1) including projects in the 2015 Rail Plan that were still valid, stakeholder input, and data and analysis conducted as part of this Rail Plan update.

FIGURE 6.1 SOURCES FOR RAIL PLAN INITIATIVES



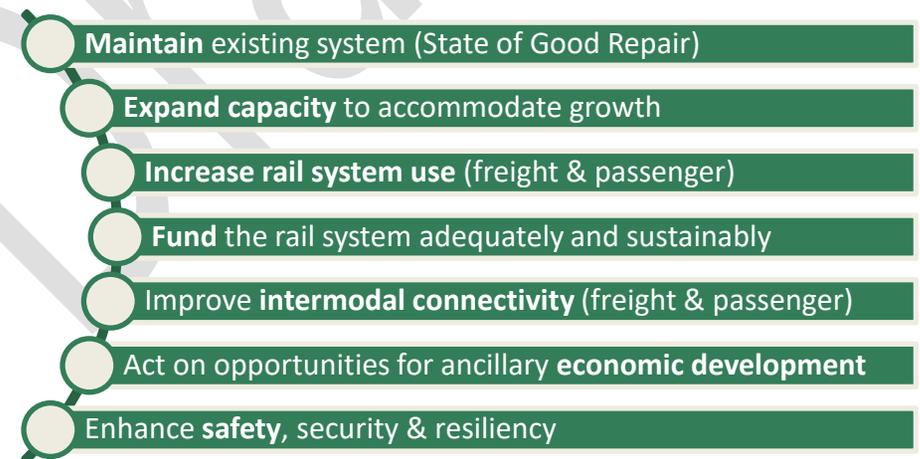
Section 7 describes how these potential initiatives were analyzed to identify a shorter set of initiatives for implementation by VTrans.

Some initiatives may be most effective when considered and developed as part of overall network efforts rather than considered only individually.

This potential impact will be considered when identifying initiatives to move forward for implementation.

In total, there are 22 location-specific initiatives (shaded in green) and 18 broader policy/program initiatives, shown in Table 6.1. This table is sorted by Rail Plan goal area (shortened to **bolded text** in the below graphic).

FIGURE 6.2 VERMONT RAIL PLAN GOALS



For purposes of this table, the “Expand Capacity” and “Increase Use” goals are combined as both ultimately are intended to grow the volumes of freight and passengers on the network. It is also important to note that although a primary goal area is listed in the table, many of the potential initiatives would address multiple goals. For example, extending the *Vermont* to Montreal (ID #100) has a primary goal area of Increase Use/Expand Capacity but also improves intermodal connectivity by linking Vermont residents to transportation options in Montreal (amongst other goals).

TABLE 6.1 POTENTIAL INITIATIVES

Initiative Description	Primary Goal Area	Freight or Passenger	Notes	Performance Measure Addressed	ID #
Educate shippers about rail and intermodal service options and contracting approaches	Economic Development	Freight	Work with economic development agencies to encourage intermodal rail freight use by private businesses where viable.	Recruit rail using businesses/Freight Volume	5
Preserve and fully use industrial land parcels with access to rail sidings as well as the rail infrastructure that provides the access.	Economic Development	Freight	Work with RPCs, railroads, agencies, economic development groups, municipalities, etc. to update inventory of these properties and help publicize in a strategic manner. Maintain viability of industrial zoned land near existing or potential sidings, spurs, etc.	Recruit rail using businesses/Freight Volume	6
Develop quick-response capability to leverage economic development opportunities	Economic Development	Freight	Collaborate with State and local economic development agencies to develop tools to help identify, promote, and calculate public/private benefits of developing rail-served sites.	Recruit rail using businesses/Freight Volume	7
Maintain and modernize freight rail yards such as NECR and CP Yards	Economic Development	Freight	Improve sorting of cars for various destinations and support functions such as car/locomotive maintenance, storage and inspection.	Other (yards and sidings)	20
Burlington Railyard Enterprise Project - multimodal transportation infrastructure improvements. See: https://www.ccrpcvt.org/our-work/transportation/current-projects/scoping/railyard-enterprise-project/	Economic Development	Both	Burlington City Council voted to pursue funding after completion of scoping study in 2020. Three potential designs have been identified to move forward to preliminary engineering pending securement of grant funding.	Other (Improvements to railyards)	116
Track and respond to COVID-19-related changes regarding impacts on the passenger and freight rail system, both direct and from demographic changes	Funding	Both	Work with Departments of Health & Education (school enrollment), RPCs, and others to understand demographic and transportation change. Increase advertising and bike/ped station access where population is increasing; engage more with e-commerce shippers to understand supply chain changes due to COVID-19 and how rail may help serve changing needs.	Other (COVID-19 impacts)	12
Seek grants and innovative funding approaches for freight and passenger rail	Funding	Both	Continue to position State to pursue federal grant opportunities and collaborate with ACCD and other economic development agencies on opportunities.	Other (funding)	18
Upgrade all rail lines to 286K weight-bearing capability	Increase Use/Expand Capacity	Freight	286,000 pound is the national standard for freight rail cars. Increasing all lines to this standard will improve regional and national connections and enhance freight business opportunities in the State.	286,000 pound bridges	2
Further enhance marketing of Vermont passenger rail	Increase Use/Expand Capacity	Passenger	Work more closely with ACCD, economic development and tourist groups, chambers, to promote passenger rail opportunities and connections to local tourist attractions.	Passenger ridership	4
Extension from Burlington to Essex Junction to connect <i>Ethan Allen Express</i> with <i>Vermont</i> .	Increase Use/Expand Capacity	Both	See results of modeling. This is a complicated initiative that would need further exploration. Also see #126 improving freight movement in the corridor.	Passenger ridership	103
Work to reduce causes of delay to Ethan Allen Express and Vermont service within and beyond Vermont's borders.	Increase Use/Expand Capacity	Passenger	Most of the delays that affect on-time performance of the Ethan Allen Express and Vermont occur outside Vermont. Working with other states and railroads to ensure delays within and beyond Vermont's borders are addressed can improve service reliability and attract more riders.	Passenger ridership On-time performance	21

Initiative Description	Primary Goal Area	Freight or Passenger	Notes	Performance Measure Addressed	ID #
Bring the <i>Vermont</i> up to 79 MPH	Increase Use/Expand Capacity	Both	See results of modeling. Would require signaling system and track work west of White River Junction, as well as installation of signaling system between Brattleboro and East Northfield, MA.	Passenger ridership On-time performance	105
Bring the Western Corridor up to 79 MPH	Increase Use/Expand Capacity	Both	See results of modeling. Would require signaling system and track improvements between Whitehall, NY and Burlington.	Passenger ridership On-time performance	106
Upgrade NECR Winooski Branch Bridges and Track to 286k standard (Burlington to Essex Junction)	Increase Use/Expand Capacity	Both	This is Class I track, rated at 10 MPH for freight. This initiative would serve freight and support extending Ethan Allen service from Burlington to Essex Junction (#103). Some work was completed to support Middlebury Tunnel detour (rail, ties, bridge timber replacement).	Bridges capable of 286,000 pounds and passenger track Class 4	126
Upgrade GMRC Bridges and Track to 286k standard (Rutland to Bellows Falls)	Increase Use/Expand Capacity	Freight	8 bridges with a load rating <286k, 17.9 miles of track is 90 lb. rail or lower. Preliminary engineering and/or right-of-way costs for the rehabilitation of three bridges on this line are included in the Governor's proposed FY22 budget.	Bridges capable of 286,000 pounds	112
Upgrade WACR Montpelier & Barre Sub. Bridges and Track up to 286k standard (Montpelier to Barre)	Increase Use/Expand Capacity	Freight	3 bridges not capable of handling 286k, 12.7 miles of 90 lb. rail or lower. Preliminary engineering costs for the rehabilitation of one bridge on this line are included in the Governor's proposed FY22 budget.	Bridges capable of 286,000 pounds	113
Upgrade WACR Connecticut River Line Bridges and Track up to 286k standard (White River Junction to Newport)	Increase Use/Expand Capacity	Freight	21 bridges load rating not sufficient for 286k, rail weight between 90 and 115 pounds. Preliminary engineering costs for the rehabilitation of five bridges, and construction costs for the rehabilitation of three bridges on this line are included in the Governor's proposed FY22 budget.	Bridges capable of 286,000 pounds	115
Achieve full NECR Double Stack Clearance (Alburgh to MA border)	Increase Use/Expand Capacity	Freight	Lowest clearance is 19'6" (US 5 in Hartland and US 7 in Georgia, VT). 14 total restrictions in Vermont to double-stack access. This is the only line in the state carrying double stack containers, but it cannot accommodate double stacked high cube containers.	Vertical clearance	120
Achieve full GMRC/CLP Double Stack Clearance (NY border to Bellows Falls)	Increase Use/Expand Capacity	Freight	19'2" clearance restriction in Proctorsville (GMRC) and Rutland Center (CLP).	Vertical clearance	121
<i>Vermont</i> Extension to Montreal – one round trip/day	Increase Use/Expand Capacity	Passenger	See results of modeling.	Passenger ridership	100
<i>Vermont</i> Extension to Montreal – two round trips/day	Increase Use/Expand Capacity	Passenger	See results of modeling.	Passenger ridership	102
<i>Vermont</i> connection at Springfield, MA to trains to Boston	Increase Use/Expand Capacity	Passenger	See results of modeling. Would provide connection for <i>Vermont</i> at Springfield to train service MassDOT is exploring in the "East-West Passenger Rail Study." See: https://www.mass.gov/east-west-passenger-rail-study .	Passenger ridership	109
Add passenger service on the Albany-Bennington-Burlington freight route to supplement <i>Ethan Allen Express</i> service in Western Corridor	Increase Use/Expand Capacity	Passenger	See results of modeling. Bus service was put in place to assess existing demand. Initiative could benefit from the improvements associated with Initiative #110.	Passenger ridership	104
Add a second daily service to the <i>Ethan Allen Express</i> New York City to Burlington.	Increase Use/Expand Capacity	Passenger	See results of modeling.	Passenger ridership	107
Extend one Valley Flyer service from Greenfield, MA to White River Junction	Increase Use/Expand Capacity	Passenger	See results of modeling. This low-volume service may be required to meet Federal Transit Administration (FTA) regulations. Under current FRA regulations, installation of PTC is not required. PTC likely would be part of a broader upgrade in the future.	Passenger ridership	108
Add whistle stop in Brandon and Shelburne areas once <i>Ethan Allen Express</i> is extended to Burlington	Increase Use/Expand Capacity	Passenger	Brandon is approximately 15 miles from both Rutland and Middlebury, Shelburne is approximately 15 miles from Vergennes and 7 miles from	Passenger ridership	123

Initiative Description	Primary Goal Area	Freight or Passenger	Notes	Performance Measure Addressed	ID #
			Burlington. Would need to assess balance of added access with added travel time.		
Facilitate development of freight transload locations in or near Vermont	Intermodal Connectivity	Freight	As demand warrants, work with customers and railroads to identify opportunities to expand or develop new transload facilities. An intermodal site could be explored where there are high volumes and Class 1 access.	Recruit rail using businesses/Freight Volume	8
Maintain and improve freight network connections for Vermont businesses to regional short-haul markets and competitive Class I railroad (mix of physical and policy matters)	Intermodal Connectivity	Freight	Advocate on behalf of Vermont businesses for enhanced operating agreements between shortline and Class I railroads to improve efficiency of interchanges. Make physical improvements to support effective interchanges, for example for the State-owned Bennington Rail Yard to be able to support interaction with long Class 1 train sets.	Recruit rail using businesses/Freight Volume	9
Improve multi-modal connections including bicycle, pedestrian, and transit to Amtrak stations. Improve wayfinding	Intermodal Connectivity	Passenger	Work with transit & tourist services to match scheduling, increase comfort and reliability of transfers. Work with municipalities to develop station area plans, improve wayfinding, and enhance bicycle and pedestrian accommodations (crosswalks, grade crossings, paths/trails, bicycle lanes, bicycle parking). Improve sharing of Amtrak guidance for bringing bicycles on trains.	Passenger ridership	14
Explore transit-oriented development (TOD)	Intermodal Connectivity	Passenger	Work with municipalities to explore and support TOD opportunities near Amtrak stations, including zoning, utility and other infrastructure, multimodal connections (see ID#14), and other needs.	Passenger ridership	15
Passenger Rail Station Improvements Statewide	Intermodal Connectivity	Passenger	See list of ADA improvements in Table 4.1. Rutland & White River Junction are VTrans/City of Rutland responsibility. Montpelier (2022), Bellows Falls (2022), Brattleboro (2022-23), Essex Junction (2021) have projects planned by Amtrak.	Other (asset management and station conditions)	111
Maintain State-owned freight trackage at FRA Track Class 2 or better and State-owned passenger rail trackage at Class 4 or better where viable based on geography	Maintenance	Both	Long-term goal for the State to upgrade where necessary and then maintain rail at levels suitable for competitive and cost-effective use. Class 2 is 25 MPH for freight, 30 MPH for passenger. Class 4 is 60 MPH for freight, 80 MPH for passenger.	FRA Class 4 for passenger rail lines On-time performance	3
Workforce development and training	Maintenance	Freight	Partner on job training with Dept. of Labor, educational facilities, and businesses to ensure that critical rail-related jobs can be filled.	Other (workforce)	11
VTR track upgrade between Manchester and Rutland to continuous welded rail (CWR) and 115 lb. capacity.	Maintenance	Freight	Higher track weight to allow for higher train speeds (passenger and freight) as well as maintain State of Good Repair. This improvement could also support Initiative #104.	Rail weight	110
Add quiet zone near South Summit St. crossing in Essex Junction	Maintenance	Passenger	Quiet Zone analysis required: https://railroads.dot.gov/elibrary/how-create-quiet-zone Quiet zones could be explored if supported by analysis as part of Initiative #103 or #126	Rehabilitate and upgrade rail crossings	124
Maintain, publicize, and enhance appropriate communication regarding rail movement and storage of hazardous materials (hazmat) while respecting rail exemptions from local control	Safety	Freight	Publicize voluntary efforts by railroads, such as the local first responder classes offered by VRS. Share the big picture, for example that storage of fuel in Vermont responds to bad winters when there were shortages. Maintain appropriate communication among State agencies, municipal staff and first responders, and railroads.	Other (rail as a good neighbor)	10

Initiative Description	Primary Goal Area	Freight or Passenger	Notes	Performance Measure Addressed	ID #
			Explore opportunities as part of shift underway to Statewide Emergency Planning Committee.		
Increase resilience of rail system to make critical infrastructure more resilient now and to prepare for increasing storm severity	Safety	Both	180 miles of rail (109 State-owned) in flood risk areas (see Figure 4.15. Work with railroads to identify priorities and funding to increase resilience.	Other (resiliency)	13
Publicize existing voluntary efforts of railroads and encourage “freight as a good neighbor” (NCHRP Syntheses 320) while respecting rail’s exemptions from local control	Safety	Freight	Highlight and support coordination on rail maintenance, operations, and construction activities. This could include -Proactively share information such as FAQs that will be on the VRS website in early 2021 -Collaborate more on getting information visible to varied audiences such as outreach campaigns ahead of <i>Ethan Allen</i> extension to Burlington. -Continue to explore positive ways for railroads and other Vermonters to resolve issues in a way that strengthens Vermont’s economy and communities.	Other (rail as a good neighbor)	19
Phased deployment of Gates/flashers at existing and planned Amtrak public road grade crossings	Safety	Both	Long-term goal of State. Phased deployment at 80 public road crossings including <i>Ethan Allen</i> (to Burlington) and <i>Vermont</i> (to Montreal) routes. Cost of upgrades and maintenance could increase subsidy required of State for Amtrak service.	Rehabilitate and upgrade rail crossings	122
Improve multi-modal crossings, such as WACR line at Montpelier Main Street and bike path area	Safety	Freight	2020 VTrans Bicycle & Ped. grant, See 2019 Scoping study: https://www.montpelier-vt.org/DocumentCenter/View/7105	Rehabilitate and upgrade rail crossings	125

7.0 INITIATIVE PRIORITIZATION

Moving from the list of potential initiatives discussed in Section 6 to a set of initiatives recommended for implementation by VTrans involved a number of steps. Those steps are discussed in this section. The result is a set of recommended initiatives that VTrans will pursue in the coming years, shown in Section 8.

Above and before these initiatives, Vermont Agency of Transportation Secretary Flynn has regularly said that the State is committed to restoring Amtrak service on existing routes as a top priority. This restoration to pre-COVID-19 levels is the minimum service level for passenger rail in Vermont.

7.1 Technical Analysis of Initiatives

VTrans is in the process of developing a new multimodal performance-based and data-driven Project Selection and Prioritization Process (VPSP2). The four goals of VPSP2 are to:

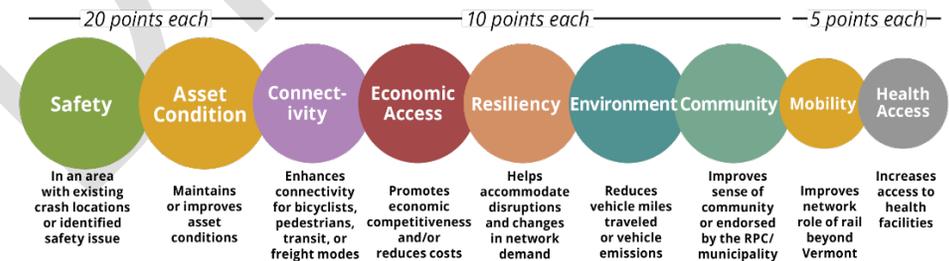
- Develop a fair, consistent, reliable, and standardized project selection and prioritization framework.
- Ensure alignment with Statewide vision, goals, and objectives and national performance measures.
- Communicate “transportation” value and provide “best value” to taxpayers.
- Move toward holistic corridor management and planning.

VPSP2 is being launched for highway projects in 2021 and is anticipated to be expanded to cover rail, aviation, transit and other modes in coming years.^{xxxvi}

A technical analysis based on the VPSP2 draft qualifications approach was applied to the list of potential initiatives shown in Table 6.1.⁶ This analysis approach was shared and discussed with the RPCs and their input was critical in modifying criteria, weighting, and initiative scoring.

This analysis considers the initiative’s potential impact across VPSP2 goal categories (Figure 7.1).

FIGURE 7.1 SCREENING CRITERIA DESCRIPTION



Source: FHI

In addition to points across these categories, the cost, feasibility of completion, and other qualitative factors including stakeholder input and VTrans’ strategic priorities were also considered. Each initiative was analyzed independently, then interdependencies between initiatives was considered. For example, Initiative #103 in Table 6.1 would extend the *Ethan Allen Express* to Essex Junction via the NECR Winooski Branch. This is separate but dependent on Initiative #126 which would complete bridge and track infrastructure work on

⁶ The criteria and weighting used to screen initiatives in this Rail Plan may not align with final VPSP2 criteria developed for the Rail Program which are under development.

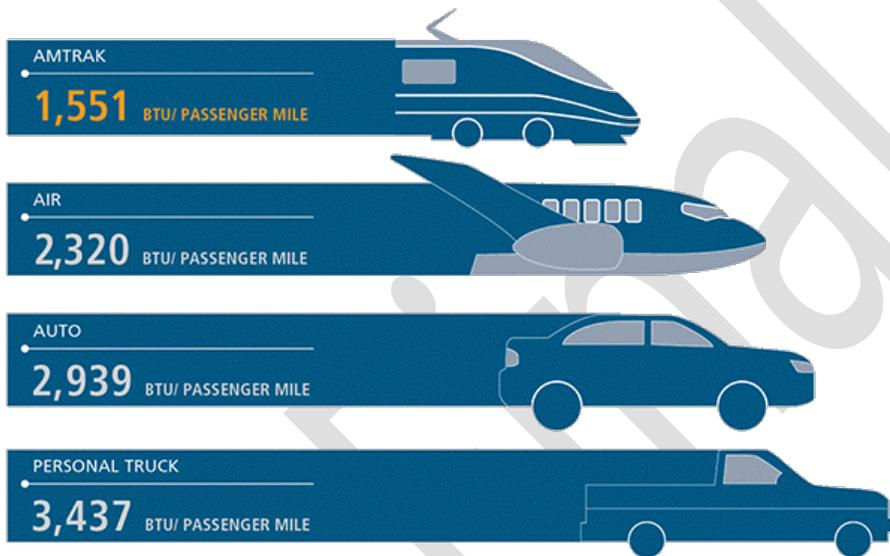
that segment. Adding passenger service without additional infrastructure work would severely limit the operating speed and make the passenger service uncompetitive with alternatives.

Details on the technical analysis approach and resulting scores is available in Tech Memo 5.

7.2 Future Service Modeling

Given ridership trends in Vermont over the last five years, additional passenger service is likely necessary to meet the associated performance measures (see Table 5.1). In addition, increasing passenger ridership will help the State meet its GHG reduction goals as rail is a more efficient mode of transportation (Figure 7.2).

FIGURE 7.2 PASSENGER MODE ENERGY EFFICIENCY



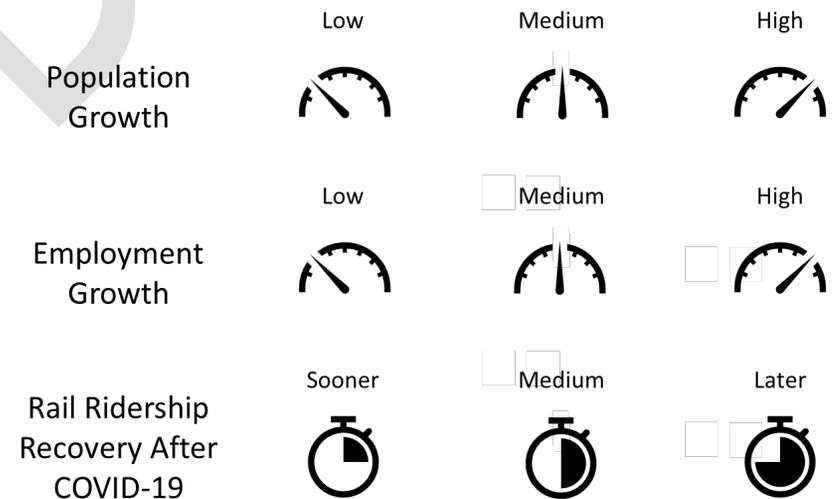
Source: Amtrak.

To understand the potential for additional ridership in the future, this Rail Plan modelled ridership through 2040 for ten scenarios. These scenarios include a

“No build” base case for the *Vermont* based on existing service, a “No build” for the *Ethan Allen Express* including the extension to Burlington, and eight additional scenarios that align with the potential initiatives.

Ridership for the service alternatives was modeled against a backdrop of three key external factors that will affect ridership over the coming years: population growth, employment growth, and the length of time required for shared-use intercity travel to return to pre-COVID-19 ridership levels, shown in Figure 7.3. Since the forecast is over a 20-year horizon, the impacts of COVID-19 are expected to occur at the beginning of the period, and thus should not affect ridership in the final forecast year. Combining all three sets of uncertainties together resulted in 27 potential growth rates from which Low, Medium, and High growth rates were developed.

FIGURE 7.3 EXTERNAL VARIABLES APPLIED TO FORECASTS



Source: Cambridge Systematics.

By 2040, “no-build” volumes were projected to range between 117,000 and 191,000 passengers, depending on growth scenario. The various initiatives could add between 4,900 riders (low growth for the *Ethan Allen Express*

extension to Essex Junction) to over 400,000 riders (high growth for twice daily *Vermont* service to Montreal).

Key notes and takeaways from the passenger scenario analysis are as follows:

- All forecasts assume recent service reliability (OTP) is maintained, and that demand is not capacity constrained, which is not necessarily true. With this assumption, the forecasts can be used to evaluate how well existing and planned services can accommodate future demand. OTP has a major impact on ridership, and improvements could produce significant additional gains.
- The forecast uses a lower overall compound annual growth rate (CAGR) than was used in the 2015 Rail Plan, reflecting ridership trends in Vermont since 2015 as well as national Amtrak ridership which had a CAGR of around 0.57 percent between FY2012 and 2019.
- The forecasts assume transportation fuel costs, which have a significant impact on the demand for passenger rail service, to remain at levels similar to those seen since 2015. The 2015 Rail Plan reflects a period when fuel costs were 25-75 percent higher than they have been since then.
- Extension of the *Vermont* to Montreal—either once or twice daily—would have the largest potential positive impact on ridership of any of the scenarios. While extending the *Ethan Allen Express* to Essex Junction (including new stops in Middlebury and Vergennes – see Figure 7.4) would have a relatively modest impact on ridership, a direct connection between the two services at Essex Junction increases the number of markets that would be served and offers the potential for greater travel flexibility and increased ridership that would result therefrom.
- Extension of a Knowledge Corridor train to White River Junction provides up to 50,000 additional riders annually by 2040. A potential alternative that may be considered is extending service to Brattleboro only.

More detailed exploration of service options may be worth examining through a Service Development Plan (SDP) for Vermont’s and northeastern New York’s passenger rail system. This SDP would entail a comprehensive approach to developing an integrated passenger rail network serving the region. It would include examining passenger demand of north- and south- connectivity at Essex Junction, and the specific impacts of particular schedules and frequencies, such as daytime versus overnight services, which may have additional impacts on future ridership.

The various scenarios modeled and their associated results are summarized in Table 7.1. Additional information about the scenarios and the modeling approach are provided in Tech Memo 4.

FIGURE 7.4 RELOCATED VERGENNES DEPOT



Vergennes is a new stop that will be served by the expanded *Ethan Allen Express*. The station is the restored and moved historic building. Source:

<https://accd.vermont.gov/sites/accdnew/files/documents/HP/VTrans%20Vergennes%20Depot%20Review%20Information.pdf>

TABLE 7.1 PASSENGER RAIL MODELING - SUMMARY RESULTS

Rail Scenarios	Description	FY2019 Ridership	2040 Ridership			
			Medium Growth (2040 Ridership)	% Change (Medium Growth – 2019 Base)	# Change (Medium Growth – 2019 Base)	
Vermont Corridor	<i>Vermont</i> – No Build	One train per day between Washington & St. Albans	78,673	89,400	14%	10,727
	<i>Vermont</i> day train extension to Montreal	One train per day to Montreal	78,673	196,000	149%	117,327
	Twice-daily <i>Vermont</i> service terminating in Montreal	Two trains per day to Montreal	78,673	382,600	386%	303,927
	Extension of one Valley Flyer train to White River Jct.	One Knowledge Corridor train extended from Greenfield, MA	0	33,100	N/A	N/A
	Connection to Boston at Springfield, MA from <i>Vermont</i> serving Montreal	One per day between Vermont & potential Springfield-Boston service	78,673	212,600	170%	133,927
	79 mph service on <i>Vermont</i> (includes Montreal extension)	Increase speed where feasible	78,673	228,600	191%	149,927
Ethan Allen Express / Western Corridor	<i>Ethan Allen Express</i> – No Build (includes Burlington extension)	One train per day between NYC & Burlington	16,561	37,300	125%	20,739
	Additional route Albany - Burlington via Bennington	One train per day serving new route in addition to existing <i>Ethan Allen Express</i>	16,561	67,400	307%	50,839
	79 mph service on <i>Ethan Allen Express</i> (includes Burlington extension)	Increase speed where feasible	16,561	39,100	136%	22,539
	<i>Ethan Allen Express</i> extension to Essex Junction.	Includes <i>Ethan Allen</i> & <i>Vermont</i> to Montreal (net increase)	95,234	238,500 (5,200)	150%	N/A

Note: Additional details on passenger ridership modeling/forecasting are available in Tech Memo 4.

8.0 RECOMMENDATIONS AND NEXT STEPS FOR VTRANS

The table of potential initiatives in Chapter 6 has a range of productive actions that could be undertaken by any of a range of entities—and indeed many will best be advanced through teamwork. **VTrans intends to lead action on 22 recommendations for projects or policies in the coming years.**

These 22 recommendations are divided into three tiers of priority. The recommendations are sorted by goal area within the tier—there is no additional prioritization of initiatives within each tier. The recommendations address specific locations, policies, and programs. Some recommendations include more than one initiative from the table in Chapter 6.

While these are VTrans top priorities, **VTrans is supportive of other initiatives from Chapter 6 advancing as well**, provided favorable conditions and funding. The recommendations are summarized below.

First Priority Set

- Track and respond to COVID-related changes regarding impacts on the passenger and freight rail system, including marketing Amtrak, particularly as service is restarted.
- Extend *Vermont* to Montreal.
- Upgrade all State-owned freight rail lines to efficiently be able to handle the industry-standard freight railcar weight of 286,000 lbs. (286k).
- Passenger rail station Improvements.
- Phased deployment of gates/flashers at existing and planned Amtrak public road grade crossings.

Second Priority Set

- Seek grants & innovative funding approaches for freight and passenger rail.

- GMRC Bridges and Track Upgrades.
- WACR Connecticut River Bridges and Track Upgrades.
- WACR Montpelier & Barre Sub. Bridges and Track Upgrades.
- Maintain and improve connectivity to regional and Class I railroads, to ensure market competitive and efficient freight service for Vermont businesses (mix of physical and policy matters).
- Improve transit, bicycle, and pedestrian connections to Amtrak trains. Improve wayfinding.
- Work to reduce causes of delay to Ethan Allen Express and Vermonter service within and beyond Vermont's borders.
- Maintain State-owned freight trackage at FRA Track Class 2 or better and state-owned passenger rail trackage at Class 4 or better where viable based on geography.
- Publicize existing voluntary efforts of railroads and encourage "freight as a good neighbor" (NCHRP Syntheses 320) while respecting rail's exemptions from local control.
- Burlington Rail Yard Enterprise project.

Third Priority Set

- Preserve and fully use industrial land parcels with access to rail sidings as well as the rail infrastructure that provides the access.
- Improve track on Western Corridor between Rutland and Manchester.
- Add passenger service on the Albany-Bennington-Burlington to supplement *Ethan Allen Express* service.
- *Ethan Allen* Amtrak service extension to link with *Vermont*: Burlington to Essex Junction/NECR track improvements.
- Publicize intermodal options to shippers, including how to use carload and intermodal freight rail. Facilitate development of additional freight transload locations in or near Vermont.
- Maintain and modernize freight rail yards such as NECR and CP Yards.
- Increase resilience of rail system to make critical infrastructure more resilient now and to prepare for increasing storm severity.

TABLE 8.1 RECOMMENDED INITIATIVES

RECOMMENDATION	DESCRIPTION <i>(SEE TABLE 6.1 FOR MORE DETAIL)</i>	GOAL AREA	PASSENGER, FREIGHT, OR BOTH	ADDITIONAL CONSIDERATIONS	INITIATIVE ID#(S)	TIMING
First Priority Set by Goal Area						
Track and respond to COVID-related changes regarding impacts on the passenger and freight rail system, including marketing Amtrak	We need to figure out how to rebound as we recover from the pandemic.	Funding	Passenger		12, 4	Short-term
Extend <i>Vermonter</i> to Montreal	This is a key, well-underway priority. It could start as one trip per day (ID 100) and then be expanded to two trips per day (ID 102).	Increase Use/ Expand Capacity	Passenger	This is a top priority for the State.	100, 102	Short-term
Upgrade all State-owned freight rail lines to be able to carry the industry-standard rail carweight of 286,000 lbs. (286k)	The policy is to attain this system-wide.	Increase Use/ Expand Capacity	Freight	Important to keep working toward this to maximize freight efficiency and expand use.	2	Short to Long-term
Passenger Rail Station Improvements	VTrans is assessing improvements needed at stations and sources of additional funding to complete them. This will result in a more-detailed plan. Also see ID 14: Multi-modal access to Amtrak stations.	Intermodal Connectivity	Passenger	VTrans will continue to evaluate all funding opportunities.	111	Short-term
Phased deployment of gates/flashers at existing and planned Amtrak public road grade crossings	Safety at rail crossings is being addressed in multiple programs including the underway 2020/2021 Section 130 analysis.	Safety	Both		122	Long-term
Second Priority Set by Goal Area						
Burlington Rail Yard Enterprise project	This is primarily a road project. \$100,000 is in the Governor's proposed FY22 budget for preliminary engineering.	Economic Development	Both		116	Long-term
Seek grants and innovative funding approaches for freight and passenger rail	There are more needs than funds currently available.	Funding	Both		18	Short-term
GMRC Bridges and Track Upgrades	Governor's proposed FY22 budget includes some work on this line.	Increase Use/ Expand Capacity	Freight	Critical east-west connection in/through Vermont.	112	Short to Long-term

RECOMMENDATION	DESCRIPTION <i>(SEE TABLE 6.1 FOR MORE DETAIL)</i>	GOAL AREA	PASSENGER, FREIGHT, OR BOTH	ADDITIONAL CONSIDERATIONS	INITIATIVE ID#(S)	TIMING
WACR Connecticut River Bridges and Track Upgrades	Governor’s proposed FY22 budget includes some work on this line.	Increase Use/ Expand Capacity	Freight	With the possible sale of PAR to CSX, this could become a very large freight through route.	115	Short to Long-term
Upgrade WACR Montpelier & Barre Sub. Bridges and Track up to 286k standard (Montpelier to Barre)	Rehabilitation of several bridges on this line are included in the Governor’s proposed FY22 budget. Preliminary engineering for one additional bridge on this line is also included in the proposed FY 22 budget.	Increase Use/ Expand Capacity	Freight		113	Short to Long-Term
Maintain and improve connectivity to regional and Class I railroads, to ensure market competitive and efficient freight service for Vermont businesses (mix of physical and policy matters).	Participate in efforts with the railroad companies, other State agencies, and businesses that enhance operating agreements between shortline and Class I railroads. Make physical improvements to support effective interchanges, for example for the State-owned Bennington Rail Yard to interact with long Class 1 train sets.	Intermodal Connectivity	Freight	This initiative will help address complex network issues with results that support Vermont businesses. Vermont has an existing investment program that promotes the economic development of rail adjacent properties for expanding rail use.	9	On-going
Improve transit, bicycle, and pedestrian connections to Amtrak trains. Improve wayfinding	Start by supporting imminent <i>Ethan Allen Express</i> service to Burlington. Encourage transit-train coordination for comfortable, reliable transfers. Encourage improvements to crosswalks, bicycle lanes, bicycle parking, and information sharing including how to take bicycles on Amtrak.	Intermodal Connectivity	Passenger	Coordinate with ID 111: Amtrak station upgrades.	14	On-going
Work to reduce causes of delay to <i>Ethan Allen Express</i> and <i>Vermonteer</i> service within and beyond Vermont’s borders.	Most of the delays that affect on-time performance of the <i>Ethan Allen Express</i> and <i>Vermonteer</i> occur outside Vermont. Working with other states and railroads to ensure delays within and beyond Vermont’s borders are addressed can	Increase Use/ Expand Capacity	Passenger		21	Long-term

RECOMMENDATION	DESCRIPTION <i>(SEE TABLE 6.1 FOR MORE DETAIL)</i>	GOAL AREA	PASSENGER, FREIGHT, OR BOTH	ADDITIONAL CONSIDERATIONS	INITIATIVE ID#(S)	TIMING
	improve service reliability and attract more riders.					
Maintain State-owned freight trackage at FRA Track Class 2 or better and state-owned passenger rail trackage at Class 4 or better where viable based on geography		Maintenance	Both		3	Long-term
Publicize existing voluntary efforts of railroads and encourage "freight as a good neighbor" (NCHRP Syntheses 320) while respecting rail's exemptions from local control	Help railroads publicize community-related postings or information, trainings. Focus period will be start of Burlington extension. Coordinate with Operation Lifesaver.	Safety	Freight		19, 10	On-going
Third Priority Set by Goal Area						
Preserve and fully use industrial land parcels with access to rail sidings as well as the rail infrastructure that provides the access	Work with RPCs, railroads, agencies, economic development groups, municipalities, etc. to update inventory of these properties and publicize in a strategic manner. Maintain viability of industrial zoned land near existing or potential sidings, spurs, etc.	Economic Development	Freight	Exploring a Transportation Planning Initiative (TPI) task for FY22 with RPCs.	6	On-going
VTR track upgrade between Manchester and Rutland to continuous welded rail (CWR) and 115 lb. capacity.	Higher track weight to allow for higher train speeds (passenger and freight) as well as maintain State of Good Repair. This improvement could also support #104.	Maintenance	Both	Work to upgrade bridges in on the Bennington & Rutland and Hoosick subdivisions is underway via BUILD grant funding.	110	Long-term
Add passenger service on the Albany-Bennington-Burlington to supplement <i>Ethan Allen Express</i> service.	This is envisioned as supplementing the existing <i>Ethan Allen Express</i> service, which is routed via Whitehall, NY, with additional service routed via Bennington. Previous studies (endnote) have evaluated other alternatives, and coordination between Vermont and New York State will be necessary to advance any service alternative in this corridor. This initiative could benefit from the improvements proposed in #110.	Increase Use/Expand Capacity	Passenger	Monitoring ridership on Shires bus connection to better understand demand.	104	Long-term

RECOMMENDATION	DESCRIPTION <i>(SEE TABLE 6.1 FOR MORE DETAIL)</i>	GOAL AREA	PASSENGER, FREIGHT, OR BOTH	ADDITIONAL CONSIDERATIONS	INITIATIVE ID#(S)	TIMING
Ethan Allen Amtrak service extension to meet Vermonter: Burlington to Essex Jnct./NECR track improvements	Need to first do track improvements in #126: NECR Winooski Track and Bridge Updates (Burlington - Essex Junction).	Increase Use/Expand Capacity	Both	Non-State asset. Work with NECR to upgrade rail and any necessary bridges to allow for 286k and FRA Track Class II/III. Currently Class I.	103, 126	Long-term
Publicize intermodal options to potential shippers, including how to contract for them. Facilitate development of additional freight transload locations in or near Vermont	Publicize, educate, and encourage use. Where viable, explore new transload facilities of appropriate scale based on service needs. Educate shippers about rail and intermodal service options and contracting approaches.	Intermodal Connectivity	Freight	Beyond transload facilities, an intermodal terminal in Vermont would require higher volumes than are currently present in Vermont.	8, 5	Short-term
Maintain and modernize freight rail yards	Support, though this would be done by the railroad companies (eg. NECR and CP).	Maintenance	Freight		20	Long-term
Increase resilience of rail system to make critical infrastructure more resilient now and to prepare for increasing storm severity	Maintain culverts, monitor erosion areas, consider physical improvements and agreements to be as ready as reasonable.	Safety	Both		13	On-going

Note: For the “Timing” Column: Short-term initiatives can be accomplished within the next five years. Long-term initiatives will start beyond five but within the next 20 years. Short to long-term initiatives should start within the next five years but continue beyond that timeframe. On-going initiatives require action throughout the next 20 years and possibly beyond.



Gathering input from the public and stakeholders at one of two Vermont Rail Plan Virtual Town Hall Meetings.

8.1 Freight Rail Initiative Effects

The freight rail initiatives aim to increase the efficiency of the Vermont freight rail system through targeted infrastructure and facility upgrades. These initiatives are expected to bring key infrastructure components up to a state of good repair, allowing for increased system reliability for shippers and customers. These initiatives also carry benefits such as increased safety, significantly improved air quality through the promotion of a shift from truck to rail transport, as well as strong economic development potential. The specific effects attributable to each initiative can be found in Tech Memo 5.

8.2 Passenger Rail Initiative Effects

The passenger rail initiatives aim to improve and expand the Vermont passenger rail system through service expansions, station enhancements, and safety upgrades. These initiatives are expected to provide additional reliable and environmentally-friendly interstate/intrastate travel options. These initiatives also carry benefits such as increased safety, and increased capacity for freight railroads. The specific effects attributable to each initiative can be found in Tech Memo 5.

8.3 Costs and Schedule

The capital costs associated with the recommended initiatives are estimated to be **\$263 million**. Approximately \$114 million would fund the capital costs of the recommended passenger initiatives, and \$149 million would fund the capital costs of the recommended freight initiatives, as Table 8.2 shows. **It is important to note that details and operating needs are still being estimated. It is essential to manage expectations in any such discussions to remain realistic.** More information is available in Tech Memo 5.

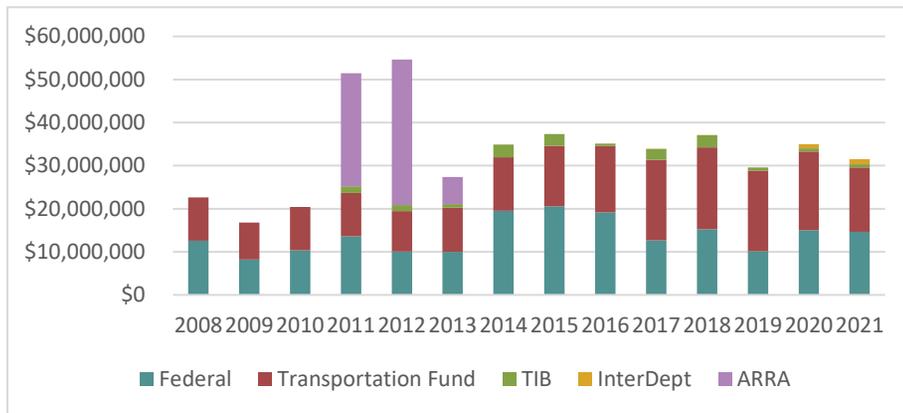
TABLE 8.2 RECOMMENDED FREIGHT AND PASSENGER CAPITAL PROGRAM BY PERIOD AND FUNDING SHARES

PERIOD	PASSEN- GER PROGRAM	FREIGHT PROGRAM	TOTAL CAPITAL PROGRAM	STATE FUNDING SHARE	FEDERAL SHARE
Short-Term (next 5 years)	\$15 million	\$29 million	\$44 million	\$9 million	\$35 million
Long-Term (years 6-20)	\$99 million	\$120 million	\$219 million	\$44 million	\$175 million
Total	\$114 million	\$149 million	\$263 million	\$53 million	\$210 million

8.4 Vermont Rail Funding

Vermont's rail program receives funding from a number of sources including Federal programs such as Section 130 funding for at-grade crossing projects, Federal grant and loan programs (BUILD, CRISI, Rail Rehabilitation and Improvement Financing, etc.) and a number of State and local funding options such as private activity bonds and transportation infrastructure bonds (TIB). Additional details are available in Tech Memo 1.

Vermont's Transportation Program includes approximately \$31 million for rail in State Fiscal Year (SFY) 2021 with funding split approximately 50/50 between State and federal sources.^{xxxvii} Figure 8.1 shows the history of funding for the rail capital program since 2008 with sources of funding. Rail funding over the last decade has averaged between \$30 million and \$40 million annually, with higher funding in 2011 and 2012 due to American Recovery and Reinvestment Act (ARRA) funds.



Source: <https://vtrans.vermont.gov/about/capital-programs>

Because there is no consistent, dedicated federal funding source for rail transportation in the United States, and most funding for Vermont’s capital needs would have to come from federal sources, **it is difficult to predict the money that would be available to fund the capital needs identified in this Plan.** Fortunately, Vermont has been successful in securing federal funding for rail in the past. However, the availability and level of funds are inconsistent, and it is not certain that VTrans will be as successful moving forward. **Based on historic trends, \$354 million is the estimated value of State and Federal funds for rail in Vermont over the next 20 years.**

8.5 Future Studies and Plans

In addition to the recommendations above, there are a number of useful studies that would enhance the development of future initiatives and continue to measure and improve system performance. These studies include:

⁷ Two Rivers Ottauquechee RPC completed a study in 2019. See: <https://www.trorc.org/programs/emergency/vt-commodity-flow-study/>

- Create a service development plan (SDP) for Vermont’s and northeastern New York’s passenger rail system –This includes examining specific impacts of frequencies, schedules, and on-time performance along routes serving the region, connectivity at Essex Junction between the *Ethan Allen* and the *Vermont*, as well as other services at Albany-Rensselaer, NY, Schenectady, NY and Springfield, MA.
- Continue to include rail in future Commodity Flow Studies (CFS). The State periodically funds CFS data collection and analysis efforts looking at HAZMAT shipments on the State transportation system.⁷
- Expand the Vermont Transportation Resiliency Planning Tool (TRPT)^{xxxix} to explore rail resiliency issues using a similar methodology.
- FHWA is in the process of updating commodity flow information from the FAF4. Once FAF5 forecasts are released, a study should be done to compare the FAF4 and FAF5 data and/or update commodity flow analysis.
- VTrans is conducting an assessment of station needs for potential inclusion in future grant applications. More information will be posted with the Rail Plan online material to provide for public comment when it is available.

8.6 Implementation Program

Table 8.3 indicates the estimated costs, funding sources, timing, and the agencies and/or other organizations that will lead or support the implementation of each priority initiative. **The estimates are preliminary.** Policy and program level initiatives do not have the capital costs of location-specific projects but they take concentrated staff effort, often in an ongoing manner to make progress on them.

TABLE 8.3 IMPLEMENTATION TABLE

INITIATIVE ID#(S)	INITIATIVE NAME	PASSENGER, FREIGHT, OR BOTH	TIMING	CAPITAL COST ESTIMATE	ADDITIONAL OPERATING AND MAINTENANCE COST ESTIMATE	PERSONNEL ESTIMATE FOR POLICY OR PROGRAM INITIATIVES	LEAD AGENCIES/ ORGANIZATIONS
First Priority Set by Goal Area							
12, 4	Track and respond to COVID-related changes as they impact the passenger and freight rail system, including marketing Amtrak as service is re-started.	Passenger	Short-term			Ballpark of 2 additional hours/week for six months (for analysis, outreach)	VTrans, Amtrak, Freight Railroads
100, 102	Extend <i>Vermont</i> er to Montreal (track improvement & station)	Passenger	Short-term	\$0 (this will be explored in 2022)	Unknown (to be explored in the future)		VTrans, Amtrak
2, 112	Upgrade all State-owned freight rail lines to efficiently accommodate industry-standard 286,000 lbs. (286k) railcars	Freight	Short to Long-term	\$22 million	\$0		VTrans
111	Passenger Rail Station Improvements	Passenger	Short-term	\$5 million (estimate may be refined pending further study)	TBD pending further study		Amtrak, Station Owners, VTrans
122	Phased deployment of gates/flashers on public at-grade crossings on routes with existing or planned Amtrak service	Both	Short to Long-term	\$40 million	Unknown		VTrans, local agencies responsible for roads/crossings
Second Priority Set by Goal Area							
116	Burlington Rail Yard Enterprise project	Both	Long-term	Up to \$22.6 million	Unknown		City of Burlington, CCRPC, VTrans, FHWA
18	Seek grants and innovative funding approaches for freight and passenger rail	Both	Short-term			3 hours/week on average--variable	VTrans, Freight Railroads

INITIATIVE ID#(S)	INITIATIVE NAME	PASSENGER, FREIGHT, OR BOTH	TIMING	CAPITAL COST ESTIMATE	ADDITIONAL OPERATING AND MAINTENANCE COST ESTIMATE	PERSONNEL ESTIMATE FOR POLICY OR PROGRAM INITIATIVES	LEAD AGENCIES/ ORGANIZATIONS
						(including to prepare applications), ongoing	
112	GMRC Bridges and Track Upgrades	Freight	Short to Long-term	\$30 million	\$0		VTrans
115	WACR Connecticut River Bridges and Track Upgrades	Freight	Short to Long-term	\$87.5 million	\$0		WACR, VTrans
113	Upgrade WACR Montpelier & Barre Sub. Bridges and Track up to 286k standard (Montpelier to Barre)	Freight	Long-term	\$9.1 million	\$0		WACR, VTrans
9	Maintain and improve connectivity to regional and Class I railroads, to ensure market competitive and efficient freight service for Vermont businesses (mix of physical and policy matters).	Freight	On-going			2 hours/week, ongoing (meetings, outreach)	VTrans, Freight Railroads, RPCs, local land use agencies
14	Improve transit, bicycle, and pedestrian connections to Amtrak trains. Improve wayfinding.	Passenger	On-going				VTrans, Amtrak, RPCs, local jurisdictions
21	Work to reduce causes of delay to <i>Ethan Allen Express</i> and <i>Vermont</i> service within and beyond Vermont's borders.	Passenger	Long-term			2 hours/week, ongoing (analysis, meetings)	VTrans, Amtrak, FRA, other states

INITIATIVE ID#(S)	INITIATIVE NAME	PASSENGER, FREIGHT, OR BOTH	TIMING	CAPITAL COST ESTIMATE	ADDITIONAL OPERATING AND MAINTENANCE COST ESTIMATE	PERSONNEL ESTIMATE FOR POLICY OR PROGRAM INITIATIVES	LEAD AGENCIES/ ORGANIZATIONS
3	Maintain State-owned freight trackage at FRA Track Class 2 or better and state-owned passenger rail trackage at Class 4 or better where viable based on geography	Both	Long-term			2 hours/week, ongoing (coordination)	VTrans, host railroads
19, 10	Publicize existing voluntary efforts of railroads and encourage "freight as a good neighbor" (NCHRP Syntheses 320) while respecting rail's exemptions from local control	Freight	On-going			2 hours/week (coordination, communication)	VTrans, Freight railroads, major shippers
Third Priority Set by Goal Area							
6	Preserve and fully use industrial land parcels with access to rail sidings as well as the rail infrastructure that provides the access	Economic Development	On-going			4 hours/week for six months (work with RPCs, ACCD, others)	RPCs, local jurisdictions, VTrans
104, 110	Improve track on Western Corridor between NY/Bennington to Rutland for freight. Potentially add passenger service Albany-Bennington-Burlington route to supplement <i>Ethan Allen Express</i> service.	Increase Use/Expand Capacity	Long-term	\$55 million	Unknown		VTrans
103, 126	<i>Ethan Allen</i> Amtrak service extension to link with <i>Vermont</i> : Burlington to Essex Jct./NECR track improvements	Increase Use/Expand Capacity	Long-term	\$14 million	Unknown		VTrans, NECR
8, 5	Publicize carload and intermodal rail options to potential shippers, including how to contract for	Intermodal Connectivity	Short-term			3 hours/week (outreach,	VTrans, Freight railroads, Economic

INITIATIVE ID#(S)	INITIATIVE NAME	PASSENGER, FREIGHT, OR BOTH	TIMING	CAPITAL COST ESTIMATE	ADDITIONAL OPERATING AND MAINTENANCE COST ESTIMATE	PERSONNEL ESTIMATE FOR POLICY OR PROGRAM INITIATIVES	LEAD AGENCIES/ ORGANIZATIONS
	them. Facilitate development of additional freight transload locations in or near Vermont					meetings), ongoing	Development Agencies (EDAs)
20	Maintain and modernize freight rail yards	Maintenance	Long-term			2 hours/week (meetings, coordination), ongoing	VTrans, Freight Railroads, Shippers
13	Increase resilience of rail system to make critical infrastructure more resilient now and to prepare for increasing storm severity	Safety	On-going			2 hours/week (analysis, coordination), ongoing	VTrans, Freight Railroads, ANR

Final

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