



# VERMONT FREIGHT & RAIL PLAN

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## PRIORITIZATION & INVESTMENT PROGRAM MEMO

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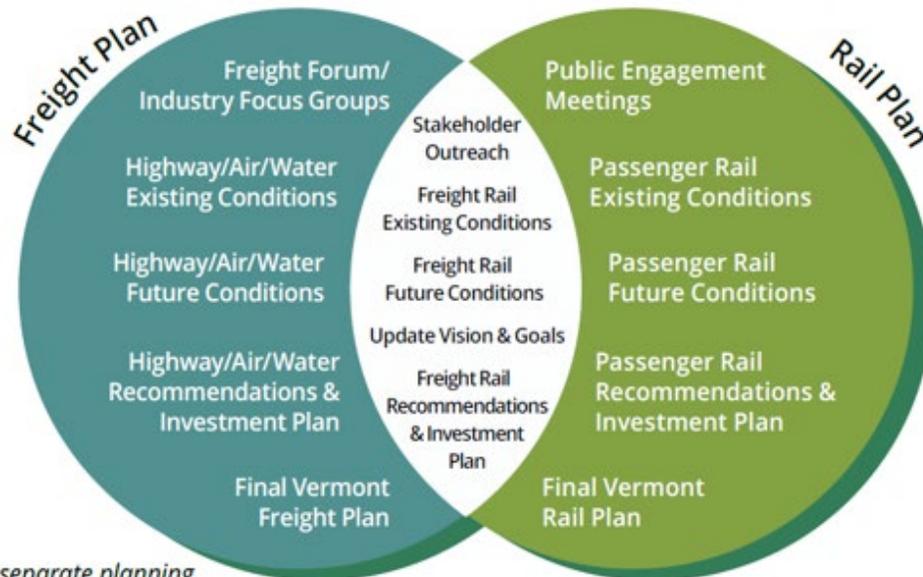
AADTT	Annual Average Daily Truck Traffic
AAR	Association of American Railroads
AOT (VTrans)	Vermont Agency of Transportation
AV/CV	Automated Vehicle/Connected Vehicle
BTS	Bureau of Transportation Statistics
BUILD	U.S. Department of Transportation's Better Utilizing Investments to Leverage Development (grant program)
CAV	Cargo Air Vehicle
CCRPC	Chittenden County Regional Planning Commission
CLP	Clarendon & Pittsford Railroad
CMAQ	Congestion Mitigation and Air Quality
CN	Canadian National
COFC	Container-on-Flat-Car
COMP	Composite Pavement Condition
COVID-19	Coronavirus Disease 2019
CP	Canadian Pacific
CRFC	Critical Rural Freight Corridors
CRISI	Consolidated Rail Infrastructure and Safety Improvements
CUFC	Critical Urban Freight Corridors
DHS	(U.S.) Department of Homeland Security
DMV	Department of Motor Vehicles
DOD	(U.S.) Department of Defense
EJ	Environmental Justice
ELD	Electronic Logging Device
EPCRA	Emergency Planning and Community Right-to-Know Act
FAST	Fixing America's Surface Transportation Act
FFY	Federal Fiscal Year
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GMRC	Green Mountain Railroad
HFT	High Frequency Train
HOS	Hours of Service
HSIP	Highway Safety Improvement Program
HTF	Highway Trust Fund
IRS	Internal Revenue Service
ITS	Intelligent Transportation Systems
LRTP	Long Range Transportation Plan
MAP-21	Moving Ahead for Progress in the 21 <sup>st</sup> Century
MNRR	Metro-North Railroad
MPH	Miles per hour
MPO	Metropolitan Planning Organization
MSDSs	Material Safety Data Sheets

NAICS	North American Industry Classification System
NECR	New England Central Railroad
NHFN	National Highway Freight Network
NHS	National Highway System
NPMRDS	National Performance Measure Research Data Set
NS	Norfolk Southern
OS/OW	Oversize/Overweight
PAR	Pan Am Railways
PAS	Pan Am Southern
PCB	Polychlorinated biphenyls
PRIIA	Passenger Rail Investment and Improvement Act
PTC	Positive Train Control
ROW	Right of way
RPC	Regional Planning Commission
RRIF	Rail Rehabilitation and Improvement Financing
RSIA	Rail Safety Improvement Act
SAE	Society of Automotive Engineers
SFY	State Fiscal Year
SIB	State Infrastructure Bank
SLR	St. Lawrence & Atlantic
SRP	State Rail Plan
STRACNET	Strategic Rail Corridor Network
TIB	Transportation Infrastructure Bonds
TIFIA	Transportation Infrastructure Finance and Innovation Act
TIGER	Transportation Investment Generating Economic Recovery
TIP	Transportation Improvement Program
TMC	Traffic Message Channel
TOFC	Trailer-on-Flat-Car
TTTR	Truck Travel Time Reliability
VMS	Variable Message Signs
VMT	Vehicles Miles Travelled
VRS	Vermont Rail System
VTR	Vermont Railway
WACR	Washington County Railroad
WIM	Weigh in motion

# 1.0 INTRODUCTION

In April 2020, the Vermont Agency of Transportation (AOT or VTTrans) contracted with Cambridge Systematics to update its 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.

**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.

The State Rail Plan provides a framework for maintaining and enhancing the state rail system. It is important to note that the State Rail Plan focuses on rail freight and intercity passenger service provided by Amtrak. Commuter rail is a form of public transit that is addressed as part of public transit plans.<sup>1</sup>

The State Freight Plan provides a framework for maintaining and enhancing all modes of freight movement in Vermont—rail, highway, air, and water.

This Technical Memo is the fifth in the set that will provide the background material and information necessary to complete the final State Rail Plan and State Freight Plan. The technical memos cover data analysis, forecasting, and the processes used in various steps of developing the rail and freight plans. The technical memos are available for review on VTTrans’ webpages for the State Rail Plan and Freight Plan.

<sup>1</sup> <https://vtrans.vermont.gov/planning/PTPP>

**This technical memorandum was produced while the effort to develop the Vermont Rail Plan was underway. In case of discrepancies between the contents of this technical memo and the Vermont Rail Plan document, the Vermont Rail Plan document prevails.**

In addition, extensive public outreach will inform development of both plans and will meet Federal Railroad Administration (FRA) requirements for the Vermont Rail Plan.

The remainder of this Technical Memo contains the following Sections:

- Section 2 – Initiative Prioritization Process
- Section 3 – Vermont Rail Service Investment Program
- Appendix A – Prioritization Worksheet
- Appendix B – Capital Cost Estimates for the Priority Initiatives

## 2.0 INITIATIVE PRIORITIZATION PROCESS

Moving from the list of potential initiatives discussed in Chapter 6 of the Rail Plan and in Tech Memo 3 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 3 of this memorandum and Chapter 8 of the Rail Plan.

**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.**

### 2.1 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.<sup>i</sup>

A technical analysis based on the VPSP2 draft qualifications approach was applied to the list of potential initiatives shown in Chapter 6 of the Rail Plan.<sup>2</sup> This analysis approach was shared and discussed with the RPCs and their input was critical in modifying criteria and initiative scoring. This analysis considers the initiative’s potential impact across VPSP2 goal categories (Figure 2.1).

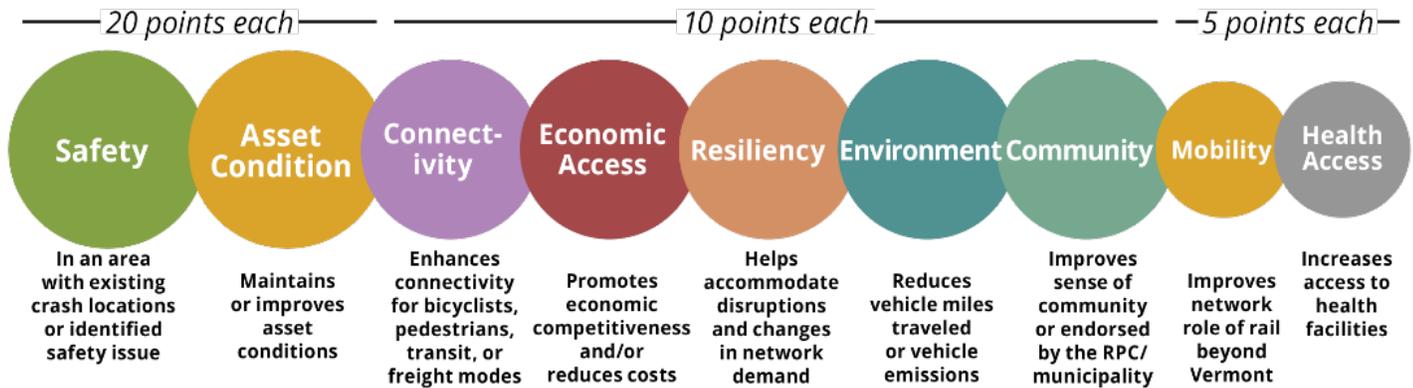
The approach to developing the evaluation of potential initiatives included three steps:

- 1. Separate the potential initiatives into “location-specific” initiatives and “program and policy” initiatives.** Location-specific initiatives include projects or other initiatives on a specific rail line, terminal, yard, spur, or other location in the State of Vermont. Program and policy initiatives are applicable statewide, or are otherwise not linked to a specific location.
- 2. Develop screening criteria and assign possible and maximum point values to each.** Within each goal area shown in Figure 2.1, a list of yes/no questions was developed, and possible points were assigned to each question. If the initiative was found to fully meet the criterion, the full possible points value were awarded. Evaluators were free to award half or part of the points in each criteria category. Zero points were awarded to initiatives that had little to no contribution to the criterion. The sum of scores for all of the criteria within each

<sup>2</sup> 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.

category could exceed the maximum number of points available in the category, however, initiatives were only awarded up to the maximum number of points available in the category.

**FIGURE 2.1 SCREENING CRITERIA DESCRIPTIONS**



Source: FHI

For example, within the Asset Condition category, there are four screening criteria:

- Does this initiative maintain or improve assets? (up to **10** points possible);
- Does this initiative upgrade or maintain rail or rail bridge capacity to 286K? (up to **15** points possible);
- Does this initiative upgrade or maintain State of Good Repair on non-rail or non-bridge assets (e.g., stations, access roads, maintenance facilities, etc.)? (up to **10** points possible); and
- Does this initiative modernize and enhance the rail system through ITS, signal upgrades, communications systems? (up to **5** points possible)

An initiative may score well across all criteria, however, the maximum number of points an initiative can carry from the Asset Condition category is **20**.

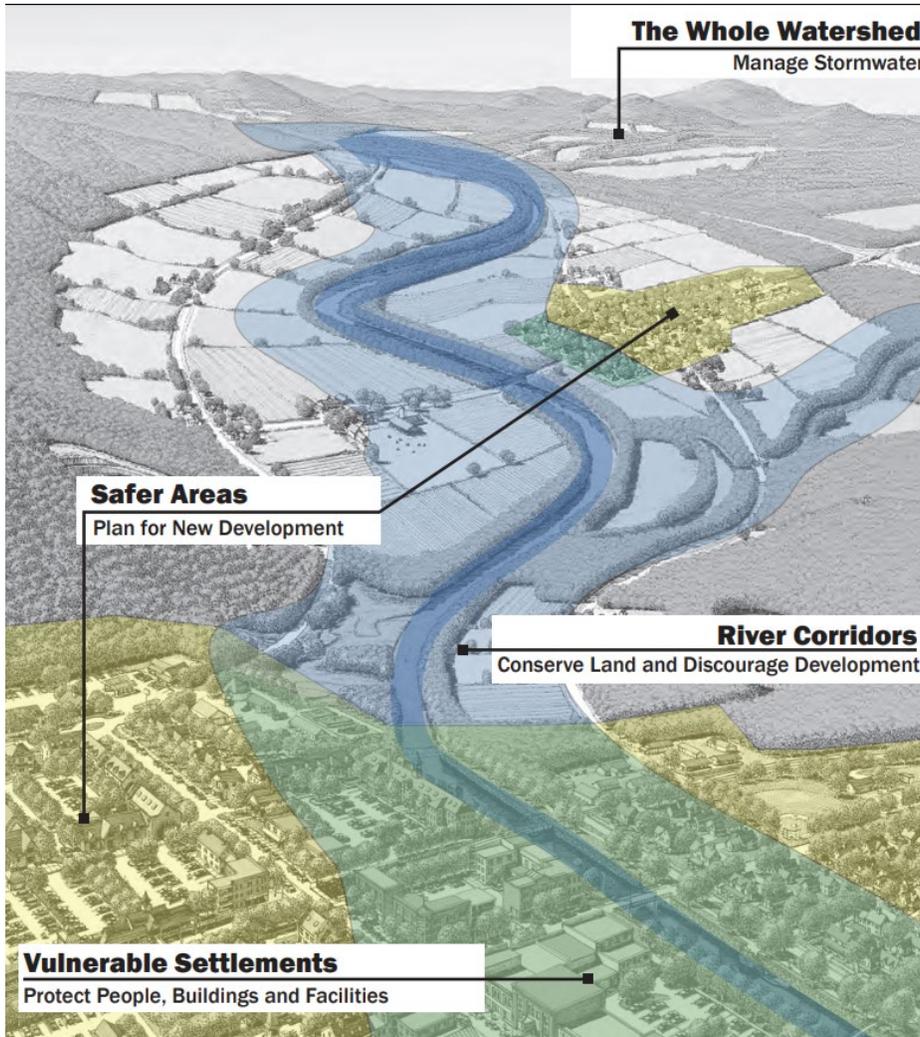
**3. Evaluate the potential initiatives by applying scores for each of the screening criteria.** The initiatives were assigned scores for each of the selection criteria, with input from VTrans, consultant team staff, and RPC staff. Reasoning that might not be obvious was documented and many items draw on mapping in the technical memoranda. The full screening workbook, with scores for each initiative, is provided as an appendix to this memorandum.

The following evaluation criteria and scoring approaches necessitate further explanation:

- In the **Resiliency** category, initiatives are eligible to receive points if they are in a 100-year flood plain, the Vermont Agency of Natural Resources (ANR) River Corridors where river courses may be shifting, or dam inundation areas. Points are awarded if the initiative would **logically address vulnerabilities or “harden” rail infrastructure that is vulnerable to flooding and potential damage during storm events**. Thus, initiatives receive points for improving the resiliency of the rail network in Vermont. This approach is an attempt to be consistent with the methodological approach in the Vermont AOT’s Transportation Resiliency Planning Tool (TRPT), as that initiative’s

methodology is developing.<sup>3</sup> This approach may be replaced or revised by an expanded TRPT in the future.

**FIGURE 2.2 ENHANCING FLOOD RESILIENCE**



Source: <https://accd.vermont.gov/community-development/flood/community-resilience>

- In the Economic Competitiveness category, one of the screening criteria asks, “Does the initiative enhance competition and/or reduce transportation costs for Vermont businesses?” **Enhancing competition** in this case could include **providing an alternative to an existing route or service, introducing a competing service provider, and/or reducing transportation costs for Vermont businesses through other means.**
- In the **Safety** category, **full credit (20 points) is given to initiatives that clearly improve safety at locations where crashes have occurred** during the 2015-2019 analysis timeframe. **Partial credit is given to initiatives that have partial or indirect safety benefits.** For example, initiatives

<sup>3</sup> <https://vtrans.vermont.gov/planning/transportation-resilience>

that lead to improvements in the level of service for freight and passenger rail services could induce mode shift from truck to freight rail or automobile to passenger rail. Therefore, some track, bridge, and other freight improvements could yield safety benefits by taking trucks off of the road. Safety evaluation could be revised pending the outcomes of the Section 130 analysis that is presently underway.

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

## 3.0 VERMONT RAIL SERVICE INVESTMENT PROGRAM

The Vermont rail service and investment program is intended to advance VTrans' vision of a safe, reliable and multimodal transportation system that grows the economy, is affordable to use and operate, and serves vulnerable populations. **Rail is an integral component of Vermont's multimodal transportation system, and provides energy-efficient travel choices and options, supports livability, contributes to the national rail system, and furthers the State's economic development and prosperity.**

### 3.1 Priority Passenger and Freight Rail Initiatives

The passenger rail initiatives proposed will connect people and places, providing needed travel options in-state and within the wider northeast region. Residents and visitors will be able board and disembark trains in cities/towns such as Middlebury and Burlington, walk and bike to their destinations, or use local transit. Connections to other major towns and destinations in New York, Massachusetts, Canada, and beyond will become increasingly available as the state's rail system and services are fully built-out.

The freight project initiatives will ensure that Vermont businesses, as well as those in neighboring states, will be able to fully participate in the national economy by having access to cost-competitive shipping options, and export markets accessed by the national and continental rail system. The service and investment program also supports the specific rail vision, goals, and objectives set forth in the Rail Plan.

**Potential initiatives were identified through ongoing planning efforts by VTrans, consultation with a variety of stakeholders, as well as discussions with the Vermont Rail Advisory Council.**

The table of potential initiatives in Tech Memo 3 and Chapter 6 of the Rail Plan 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. **The range of potential initiatives are supported by this Rail Plan.**

Based upon the outcomes of the Initiatives Prioritization process described in Section 2, **VTrans intends to lead action on 23 recommendations for projects or policies in the coming years, with "short-term" occurring during the years 2021-2026, and "long-term" occurring from 2027 through 2040.** 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.

The recommendations are summarized below and in Table 3.1. Three additions since the draft Plan was released in February are highlighted in the summary 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**

- Burlington Rail Yard Enterprise project.
- Seek grants and 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.

### **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;
- Improve track on NECR between Burlington and Essex Junction;
- *Ethan Allen Express* Amtrak service extension to link with *Vermonter* at Essex Junction.
- 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 3.1 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
<b>First Priority Set by Goal Area</b>						
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
<b>Second Priority Set by Goal Area</b>						
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		Funding	Both		18	Short-term

RECOMMENDATION	DESCRIPTION <i>(SEE TABLE 6.1 FOR MORE DETAIL)</i>	GOAL AREA	PASSENGER, FREIGHT, OR BOTH	ADDITIONAL CONSIDERATIONS	INITIATIVE ID#(S)	TIMING
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
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)	Preliminary engineering for Bridge 304 is included in the Governor's proposed FY22 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>Vermont</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>Vermont</i> 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.	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
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
<b>Third Priority Set by Goal Area</b>						
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 for freight use.	Higher track weight to allow for higher train speeds (passenger and freight) as well as maintain State of Good Repair.	Maintenance	Freight	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.	Need to first do track improvements in #110. 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 <sup>ii</sup> have evaluated other alternatives, and coordination between Vermont and New York State will be necessary to advance any service alternative in this corridor.	Increase Use/Expand Capacity	Passenger	Monitoring ridership on Shires bus connection to better understand demand. Track work proposed to support freight operations in this corridor (#110) would be implemented before this initiative.	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
Burlington to Essex Jct./NECR track improvements,	NECR Winooski Track and Bridge Updates (Burlington - Essex Junction).	Increase Use/ Expand Capacity	Freight	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.	126	Long-term
<i>Ethan Allen Express</i> Amtrak service extension to meet Vermonter	Need to first do track improvements in #126.	Increase Use/ Expand Capacity	Passenger		103	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.

## 3.2 Vermont Rail Funding and Financing

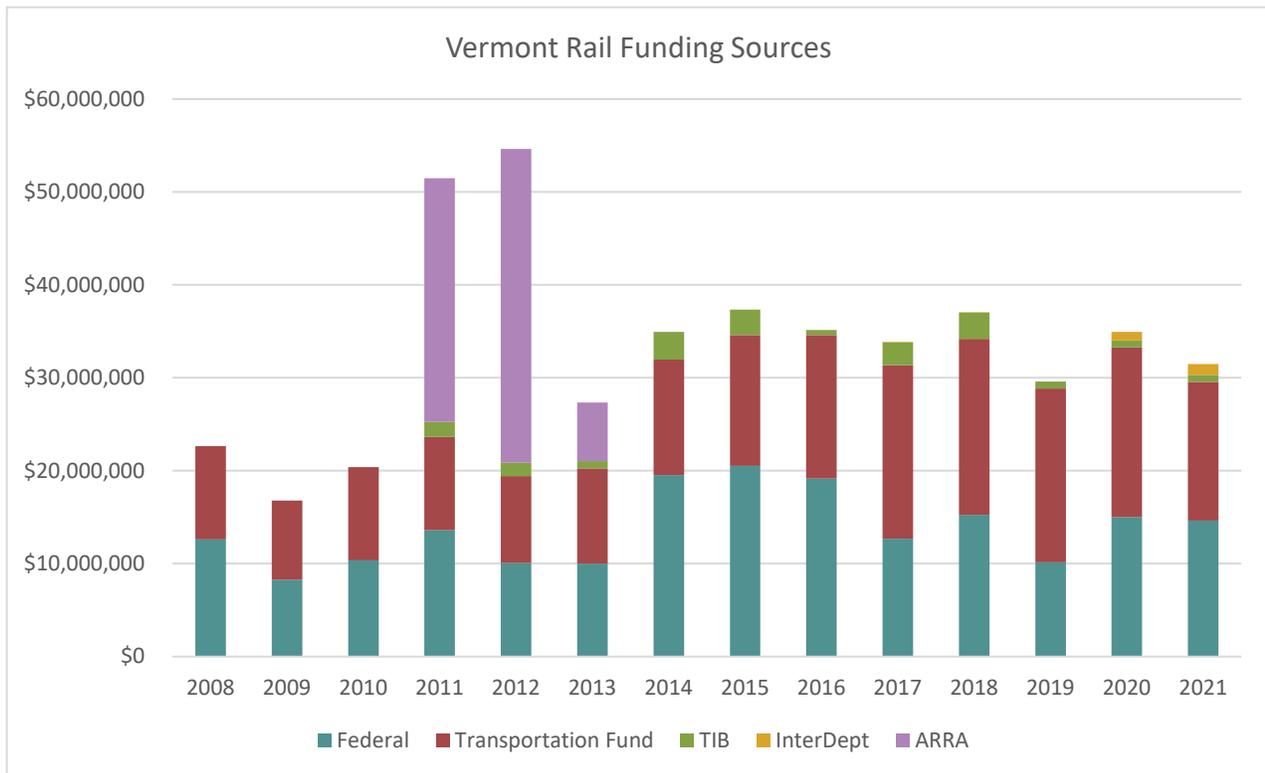
As discussed in detail in Tech Memo 1, **Vermont's rail program receives funding from a number of sources** including Federal programs such as Section 130 funding for at-grade crossing projects, Federal grant and loan programs (Better Utilizing Investments to Leverage Development, Consolidated Rail Infrastructure and Safety Improvements, 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).

Vermont's Transportation Program includes **approximately \$31 million for rail in SFY2021** with funding split approximately 50/50 between state and federal sources.<sup>iii</sup> Figure 7.2 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.

A variety of federal funding sources have supported rail in Vermont, including grants, such as the TIGER Discretionary Grant programs and the High Speed Intercity Passenger Rail (HSIPR) program. Upgrades to crossings are supported by the FHWA Section 130 Crossing Improvement Program. Vermont additionally received funds from the Federal Emergency Management Administration (FEMA) following the destruction from Tropical Storm Irene.

The annual **State funding available to cover capital needs is approximately \$4 million**, a figure that has remained relatively stable for most of the past decade. While appropriations for rail activities by the Vermont legislature are much higher than \$4 million per year, most VTrans funding for rail covers ongoing operating expenses, such as supporting Amtrak service and VTrans rail program staff, and is not available for capital expenditures.

**FIGURE 3.1 VERMONT RAIL FUNDING SOURCES (SFY2008-2021)**



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

### Future Funding

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 in securing federal funding moving forward.

Estimated funds budgeted for Vermont’s Rail Program (including capital and operating costs) over the next three years include: \$36.8 million in Fiscal Year (FY) 2022; \$35.5 million in FY 2023; and \$32.9 million in FY 2024. **The actual funding that may be available in these and other future years could be affected by Vermont’s success in securing future Federal grants and a range of other factors affecting Federal and State funding. Even the annual State funding is determined year-by-year and is in no way guaranteed.**

**Based on historic trends**, over a 20 year period, the \$4 million in annual State funding for rail capital needs would total to around \$80 million. Since 2008, federal funding levels have averaged about \$13.7 million per year. If funding for rail in Vermont were to be consistent with previous levels since 2008, then **available funding over the next 20 years is estimated to be approximately \$354 million** (\$13.7 million federal x 20 years + \$4 million state x 20 years). **This compares to approximately \$268 million in first-, second-, and third-priority capital needs**

that have been identified in this Plan. **It is important to note that details and operating needs are still being estimated.**

While the **projected available resources are likely to cover the cost of Vermont’s priority rail investments** over the next 20 years, there are unmeasured costs and additional needs, including initiatives listed in Chapter 6 of the Rail Plan, that will have to **compete for remaining resources.** Vermont may be able to advance some long-term initiatives earlier on, promote additional initiatives from the full list, and/or develop new initiatives to respond to changing conditions and needs over time. **It is essential to manage expectations in any such discussions to remain realistic.**

Table 3.2 shows the estimated program of capital costs for the priority freight and passenger rail initiatives, and estimated State and Federal shares based upon an assumed 80% Federal, 20% State split. The short-term period covers the next five years, and the long-term period covers years 6-20.

**TABLE 3.2 RECOMMENDED FREIGHT AND PASSENGER CAPITAL PROGRAM BY PERIOD AND FUNDING SHARES**

PERIOD	PASSENGER PROGRAM	FREIGHT PROGRAM	TOTAL PROGRAM	STATE FUNDING SHARE	FEDERAL FUNDING SHARE
Short-Term (next 5 years)	\$15 million	\$29 million	\$44 million	\$9 million	\$35 million
Long-Term (years 6-20)	\$30 million	\$193 million	\$224 million	\$45 million	\$179 million
<b>Total</b>	<b>\$45 million</b>	<b>\$223 million</b>	<b>\$268 million</b>	<b>\$54 million</b>	<b>\$214 million</b>

### 3.3 Summary of Proposed Investments

Table 3.3 displays a initiatives-level summary of investments proposed in this Plan, including estimated costs, potential funding sources, and expected transportation, economic, environmental, and other effects of the initiatives on the State’s transportation system.

**TABLE 3.3 SUMMARY OF RECOMMENDED CAPITAL INITIATIVES BY COSTS, LIKELY FUNDING SOURCE, PROGRAM EFFECTS, AND TIMING**

RECOMMENDED INITIATIVE	ESTIMATED CAPITAL COST	INCREMENTAL ANNUAL OPERATING EXPENSE	FUNDING SOURCE(S)	PROGRAM EFFECTS	INITIATIVE ID#(S); PRIORITY LEVEL	TIMING
<b>Passenger Rail Capital Initiatives</b>						
Extend <i>Vermont</i> to Montreal	\$0 (this will be explored in 2022)	Unknown (to be explored in the future)	State rail program	<p><b>The State’s Transportation System:</b> Enables Vermont rail passengers to travel to/from Montreal, reduces automobile travel between Montreal and points in U.S.</p> <p><b>Public:</b> New transportation options, increases intercity passenger rail ridership by more than 100,000 riders per year by 2040.</p> <p><b>Rail Capacity and Congestion:</b> NA</p> <p><b>Transportation System Capacity, Congestion, Safety, and Resiliency:</b> Improves safety because rail is safer than single occupancy vehicles, adds capacity by reducing vehicle trips to/from Montreal.</p> <p><b>Environmental, Economic, Livability and Employment Conditions:</b> Reduces auto emissions and promotes healthy environment by diverting drivers from cars, promotes employment by enabling cross border tourism.</p> <p><b>Distribution of Benefits to Regions:</b> Benefits will be distributed across <i>Vermont</i> route, but also across <i>Ethan Allen Express</i> route if <i>Ethan Allen Express</i> is extended to interchange at Essex Junction.</p>	100, 102; First	Short-term
Passenger Rail Station Improvements	\$5 million (estimate may be refined pending further study)	Unknown	State rail program, Federal grants	<p><b>The State’s Transportation System:</b> Bring stations to a state of good repair, improve accessibility of stations, or provide new passenger amenities.</p> <p><b>Public:</b> Returns stations to a state of good repair, improves public experience of intercity passenger rail travel.</p> <p><b>Rail Capacity and Congestion:</b> N/A</p>	111; First	Short-term

RECOMMENDED INITIATIVE	ESTIMATED CAPITAL COST	INCREMENTAL ANNUAL OPERATING EXPENSE	FUNDING SOURCE(S)	PROGRAM EFFECTS	INITIATIVE ID#(S); PRIORITY LEVEL	TIMING
				<p><b>Transportation System Capacity, Congestion, Safety, and Resiliency:</b> Provides options to auto travel, thereby freeing roadway capacity, improving safety because rail is a safer mode of transportation than single occupancy vehicle transportation.</p> <p><b>Environmental, Economic, Livability and Employment Conditions:</b> Reduces auto emissions and promotes healthy environment by diverting drivers from cars.</p> <p><b>Distribution of Benefits to Regions:</b> Unknown.</p>		
<p>Phased Deployment of gates/flashers at public at-grade crossings on routes hosting existing or planned Amtrak service</p>	<p>\$40 million</p>	<p>Unknown</p>	<p>State rail program, Section 130, Federal grants</p>	<p><b>The State’s Transportation System:</b> Reduces the risk of crashes at grade crossings.</p> <p><b>Public:</b> Improves public safety and reduces public costs of incidents at crossings</p> <p><b>Private:</b> Improves efficiency of freight operations</p> <p><b>Rail Capacity and Congestion:</b> Reduces unreliability and congestion from crashes</p> <p><b>Transportation System Capacity, Congestion, Safety, and Resiliency:</b> Improves public safety by reducing the risk of crashes.</p> <p><b>Environmental, Economic, Livability and Employment Conditions:</b> Improved safety (including for people biking and walking), promotes equity and livability.</p> <p><b>Distribution of Benefits to Regions:</b> Unknown.</p>	<p>122; First</p>	<p>Short-term</p>
<p>Add passenger service on the Albany-Bennington-Burlington to supplement <i>Ethan Allen Express</i> service.</p>	<p>Unknown, beyond the estimated cost of Initiative 110, which is a prerequisite</p>	<p>Unknown</p>	<p>State rail program, Federal grants</p>	<p><b>The State’s Transportation System:</b> Provides people traveling to/from western Vermont with a new transportation option between Albany, NY and Burlington.</p> <p><b>Public:</b> New transportation options, increases intercity passenger rail ridership by 30,000 riders per year by 2040, supports economy and tourism, also diverts freight from highways</p>	<p>104; Third</p>	<p>Long-term</p>

RECOMMENDED INITIATIVE	ESTIMATED CAPITAL COST	INCREMENTAL ANNUAL OPERATING EXPENSE	FUNDING SOURCE(S)	PROGRAM EFFECTS	INITIATIVE ID#(S); PRIORITY LEVEL	TIMING
				<p><b>Private:</b> Improves efficiency of freight operations</p> <p><b>Rail Capacity and Congestion:</b> Increases capacity of rail line between Rutland and New York border.</p> <p><b>Transportation System Capacity, Congestion, Safety, and Resiliency:</b> Increases total capacity of intercity passenger transportation system, improves safety because rail is safer than single occupancy vehicles. Promotes safety because rail is safer than single occupant automobile travel.</p> <p><b>Environmental, Economic, Livability and Employment Conditions:</b> Reduces auto emissions and promotes healthy environment by diverting drivers from cars, promotes employment by increasing mobility and supports access to Vermont tourist attractions.</p> <p><b>Distribution of Benefits to Regions:</b> Benefits will accrue to Western Vermont</p>		
<p><i>Ethan Allen</i> Amtrak service extension to link with Vermonter</p>	<p>Unknown, beyond the estimated cost of Initiative 126, which is a prerequisite investment</p>	<p>Unknown</p>	<p>State rail program, Federal grants, NECR</p>	<p><b>The State's Transportation System:</b> Will provide passenger with the ability to interchange between the expanded Ethan Allen Express service and the Vermonter service. Will also improve efficiency of Ethan Allen Express operations.</p> <p><b>Public:</b> Improved connectivity of passenger rail network, also diverts freight from highways.</p> <p><b>Private:</b> Ability to operate 286,000 pound railcars, more efficient freight operations.</p> <p><b>Rail Capacity and Congestion:</b> Increases capacity of rail line between Burlington and Essex Junction, enabling line to accommodate 286,000 pound cars.</p> <p><b>Transportation System Capacity, Congestion, Safety, and Resiliency:</b> Increases connectivity of transportation system, improves safety because rail is safer than single occupancy vehicles.</p> <p><b>Environmental, Economic, Livability and Employment Conditions:</b> Reduces auto emissions</p>	<p>103; Third</p>	<p>Long-term</p>

RECOMMENDED INITIATIVE	ESTIMATED CAPITAL COST	INCREMENTAL ANNUAL OPERATING EXPENSE	FUNDING SOURCE(S)	PROGRAM EFFECTS	INITIATIVE ID#(S); PRIORITY LEVEL	TIMING
				and promotes healthy environment by diverting drivers from cars, promotes employment by increasing mobility. <b>Distribution of Benefits to Regions:</b> Will benefit passengers on either the Ethan Allen Express or the Vermonter interchanging through Burlington.		
<b>Freight Rail Initiatives</b>						
Upgrade all State-owned freight rail lines to be able to carry the industry-standard 286,000 lbs (286k) railcars	\$131.1 million (the sum of #112, 113, 115)	\$0	State rail program, Federal grants	<p><b>The State’s Transportation System:</b> Brings bridge substructures and track to a state of good repair and accommodate 286,000 pound railcars.</p> <p><b>Public:</b> Brings Vermont-owned bridges to a state of good repair, diverts freight from highways.</p> <p><b>Private:</b> Partially enables 286,000 pound operations, removes slow orders.</p> <p><b>Rail Capacity and Congestion:</b> Partially enables 286,000 pound operations.</p> <p><b>Transportation System Capacity, Congestion, Safety, and Resiliency:</b> Improves safety by diverting freight from highway to rail, which is a safer mode of transportation, frees roadway capacity. Increases resiliency by enabling bridges to better withstand flooding.</p> <p><b>Environmental, Economic, Livability and Employment Conditions:</b> Reduces greenhouse gas emissions by diverting freight from truck to rail, reduces the cost of rail transportation.</p> <p><b>Distribution of Benefits to Regions:</b> Benefits rail users statewide.</p>	2; First	Short to Long-term
Burlington Rail Yard Enterprise project	Up to \$22.6 million	Unknown	State rail program, Federal grants,	<p><b>The State’s Transportation System:</b> Constructs roadways through the Burlington rail yard, potentially causing some portions of the yard to be moved.</p> <p><b>Public:</b> Improves connectivity and livability,</p>	116; Second	Long-term

RECOMMENDED INITIATIVE	ESTIMATED CAPITAL COST	INCREMENTAL ANNUAL OPERATING EXPENSE	FUNDING SOURCE(S)	PROGRAM EFFECTS	INITIATIVE ID#(S); PRIORITY LEVEL	TIMING
			local funding	<p>promotes economic development</p> <p><b>Rail Capacity and Congestion:</b> NA</p> <p><b>Transportation System Capacity, Congestion, Safety, and Resiliency:</b> May reduce roadway congestion in Burlington.</p> <p><b>Environmental, Economic, Livability and Employment Conditions:</b> Promotes livability and economic development in Burlington.</p> <p><b>Distribution of Benefits to Regions:</b> Burlington.</p>		
GMRC Bridges and Track Upgrades	\$30 million	\$0	State rail program, Federal grants	<p><b>The State’s Transportation System:</b> Brings bridges and track on the GMRC to a state of good repair and able to accommodate 286,000 pound railcars.</p> <p><b>Public:</b> Brings Vermont-owned bridges to a state of good repair, diverts freight from highways</p> <p><b>Private:</b> Partially enables 286,000 pound operations, removes slow orders</p> <p><b>Rail Capacity and Congestion:</b> Partially enables rail line to accommodate higher capacity railcars.</p> <p><b>Transportation System Capacity, Congestion, Safety, and Resiliency:</b> Improves safety by diverting freight from highway to rail, which is a safer mode of transportation, frees roadway capacity.</p> <p><b>Environmental, Economic, Livability and Employment Conditions:</b> Reduces greenhouse gas emissions by diverting freight from truck to rail, reduces the cost of rail transportation.</p> <p><b>Distribution of Benefits to Regions:</b> Benefits GMRC corridor, corridors that interchange with the GMRC.</p>	112; Second	Short-to-Long Term
WACR Connecticut River	\$87.5 million	\$0	State rail program,	<p><b>The State’s Transportation System:</b> Brings bridges, tracks, ties, ballast, turnouts to a state of good repair and current standards.</p> <p><b>Public:</b> Brings Vermont-owned rail line to a state of</p>	115; Second	Short to Long-term

RECOMMENDED INITIATIVE	ESTIMATED CAPITAL COST	INCREMENTAL ANNUAL OPERATING EXPENSE	FUNDING SOURCE(S)	PROGRAM EFFECTS	INITIATIVE ID#(S); PRIORITY LEVEL	TIMING
Bridges and Track Upgrades			Federal grants	<p>good repair, diverts freight from highways.</p> <p><b>Private:</b> Partially enables 286,000 pound operations, removes slow orders, reduces future maintenance.</p> <p><b>Rail Capacity and Congestion:</b> Partially enables 286,000 pound operations. <b>Transportation System Capacity, Congestion, Safety, and Resiliency:</b> Improves safety by diverting freight from highway to rail, which is a safer mode of transportation, frees roadway capacity.</p> <p><b>Environmental, Economic, Livability and Employment Conditions:</b> Reduces greenhouse gas emissions by diverting freight from truck to rail, reduces the cost of rail transportation and enhances competitive class I railroad access.</p> <p><b>Distribution of Benefits to Regions:</b> Benefits the WACR Conn. River corridor, corridors that interchange with the WACR Conn. River.</p>		
WACR Montpelier and Barre Sub. Bridges and Track Upgrades	\$9.1 million	\$0	State rail program, Federal grants	<p><b>The State’s Transportation System:</b> Brings bridges on the WACR M&amp;B Sub to a state of good repair and able to accommodate 286,000 pound railcars.</p> <p><b>Public:</b> Brings Vermont-owned bridges to a state of good repair, diverts freight from highways</p> <p><b>Private:</b> Partially enables 286,000 pound operations, removes slow orders.</p> <p><b>Rail Capacity and Congestion:</b> Partially enables rail line to accommodate higher capacity railcars.</p> <p><b>Transportation System Capacity, Congestion, Safety, and Resiliency:</b> Improves safety by diverting freight from highway to rail, which is a safer mode of transportation, frees roadway capacity.</p> <p><b>Environmental, Economic, Livability and Employment Conditions:</b> Reduces greenhouse gas</p>	113; Second	Short-to-Long Term

RECOMMENDED INITIATIVE	ESTIMATED CAPITAL COST	INCREMENTAL ANNUAL OPERATING EXPENSE	FUNDING SOURCE(S)	PROGRAM EFFECTS	INITIATIVE ID#(S); PRIORITY LEVEL	TIMING
				emissions by diverting freight from truck to rail, reduces the cost of rail transportation. <b>Distribution of Benefits to Regions:</b> Benefits WACR M&B corridor, corridors that interchange with the WACR M&B corridor.		
<p>Improve track on Western Corridor between Rutland and Bennington.</p> <p>This work could also support Initiative 104, adding passenger service on the Albany-Bennington-Burlington to supplement <i>Ethan Allen Express</i> service.</p>	\$55 million	Unknown	State rail program, Federal grants	<p><b>The State's Transportation System:</b> Brings bridges on the VTR to a state of good repair and able to accommodate 286,000 pound railcars. Investment could support future passenger service in this corridor (Initiative 104).</p> <p><b>Public:</b> Brings Vermont-owned bridges to a state of good repair, diverts freight from highways.</p> <p><b>Private:</b> Enables 286,000 pound operations, removes slow orders.</p> <p><b>Rail Capacity and Congestion:</b> Enables rail line to accommodate higher capacity railcars.</p> <p><b>Transportation System Capacity, Congestion, Safety, and Resiliency:</b> Improves safety by diverting freight from highway to rail, which is a safer mode of transportation, frees roadway capacity.</p> <p><b>Environmental, Economic, Livability and Employment Conditions:</b> Reduces greenhouse gas emissions by diverting freight from truck to rail, reduces the cost of rail transportation.</p> <p><b>Distribution of Benefits to Regions:</b> Benefits VTR corridor, corridors that interchange with the VTR</p>	110; Third	Long-term
NECR track improvements, Burlington to Essex Junction.	\$14 million	Unknown	State rail program, Federal grants, NECR	<p><b>The State's Transportation System:</b> Upgrades rail on the NECR Winooski Branch between Burlington and Essex Junction.</p> <p><b>Public:</b> Diverts freight from highways, enables potential extension of <i>Ethan Allen Express</i> from Burlington to Essex Junction.</p>	126; Third	Long-term

RECOMMENDED INITIATIVE	ESTIMATED CAPITAL COST	INCREMENTAL ANNUAL OPERATING EXPENSE	FUNDING SOURCE(S)	PROGRAM EFFECTS	INITIATIVE ID#(S); PRIORITY LEVEL	TIMING
<p>This work could also support Initiative 103, extending <i>Ethan Allen Express</i> passenger service to meet <i>Vermonters</i> at Essex Junction</p>				<p><b>Private:</b> Enables 286,000 pound operations, removes slow orders, reduces future maintenance, brings Winooski Branch to a state of good repair, improves operations.</p> <p><b>Rail Capacity and Congestion:</b> Enables 286,000 pound freight operations, passenger rail operations.</p> <p><b>Transportation System Capacity, Congestion, Safety, and Resiliency:</b> Improves safety by diverting freight from highway to rail, which is a safer mode of transportation, frees roadway capacity.</p> <p><b>Environmental, Economic, Livability and Employment Conditions:</b> Reduces greenhouse gas emissions by diverting freight from truck to rail, reduces the cost of rail transportation.</p> <p><b>Distribution of Benefits to Regions:</b> Benefits the Winooski Branch, but also potentially benefits the Ethan Allen Express and the Vermonters routes.</p>		

### 3.4 Forecasted State Support for Amtrak Service

Projected operating costs and required state support were estimated through 2040 for the *Ethan Allen Express* and the *Vermont* Base Case scenarios. Consistent with the passenger volume forecasts, the base case scenario for the *Ethan Allen* includes the extension from Rutland to Burlington, with service expected to commence in 2022. With FY 2020 expenses and revenues being abnormal due to the COVID-19 pandemic, FY 2019 data served as the base from which costs and revenues were forecast. This included the FY 2019 Amtrak PRIIA 209 State Payment Forecasts for each train, along with estimated ridership and corresponding revenue for the three growth scenarios described in Chapter 7 of the Rail Plan and Tech Memo 4. Through 2040, service expenses were projected to increase by 3% annually, over and above the underlying inflation rate, while revenues per passenger would remain static and simply keep up with inflation. These estimates do not take into consideration expense and revenue allocation agreements with partnering states, New York in the case of the *Ethan Allen*, and Massachusetts and Connecticut in the case of the *Vermont*.

#### *Ethan Allen Express, Extended to Burlington*

The extended *Ethan Allen* service to Burlington will incur higher operating expenses due to the roughly 60-mile increase in distance that the train will travel. The resulting increase in operating cost was estimated at \$0.30 million annually in 2014, assuming the use of a single locomotive to operate the train. This amount, combined with the operating costs associated with the trains existing operation to Rutland, was projected to 2040 using a 3% cumulative annual growth rate.

As Table 3.4 indicates, the extension to Burlington is expected to require some level of financial support, even with the anticipated gains in passenger volumes and revenues that will result from serving Middlebury, Vergennes, and Burlington. Under the low growth scenario, the projected state subsidy is expected to be just over \$3 million, a figure which dips slightly under the medium growth scenario. In comparison, the *Ethan Allen* required a state subsidy of about \$1.57 million in 2019. Under the high growth scenario, a subsidy of approximately \$0.36 million would be required in 2040.

**TABLE 3.4 ETHAN ALLEN EXTENSION 2040 FINANCIAL ESTIMATES**

	FY 2019	Low Growth	Medium Growth	High Growth
	Actual	2040 Forecast	2040 Forecast	2040 Forecast
Operating Expenses (millions)	\$3.30	\$6.15	\$6.15	\$6.15
Capital Expenses (millions)	\$0.37	\$0.70	\$0.70	\$0.70
Burlington Extension (millions)	N/A	\$0.65	\$0.65	\$0.65
<b>Total Expenses (millions)</b>	<b>\$3.67</b>	<b>\$7.50</b>	<b>\$7.50</b>	<b>\$7.50</b>
Ridership	16,561	34,900	37,300	56,300
<b>Total Revenue (millions)</b>	<b>\$2.10</b>	<b>\$4.42</b>	<b>\$4.73</b>	<b>\$7.14</b>
<b>Required State Support</b>	<b>\$1.57</b>	<b>\$3.08</b>	<b>\$2.77</b>	<b>\$0.36</b>

## Vermont

The base scenario for the *Vermont* assumes continuation of the service as it currently exists, operating between Washington DC and St. Albans, VT on a daytime schedule. Ongoing operating costs to extend the service to Montreal are presently under development, and thus were not available. As such, 2019 expenses allocated to Vermont for operating the existing service were approximately \$8.18 million. Based on a 3% annual growth rate, these expenses escalate to \$15.2 million in 2040.

As Table 3.5 indicates, state support is required under all three ridership growth scenarios. In 2019, the *Vermont* service required a subsidy of just under \$5 million. If the low growth forecast comes to fruition, the required support would increase to \$11.85 million. Under the medium growth forecast, the required support would drop slightly to \$11.56 million, although still higher than the amount incurred in 2019. Under the high growth forecast, the required state support would decline to under \$10 million.

**TABLE 3.5 VERMONT 2040 FINANCIAL ESTIMATES**

	FY 2019	Low Growth	Medium Growth	High Growth
	Actual	2040 Forecast	2040 Forecast	2040 Forecast
Operating Expenses (millions)	\$7.40	\$13.76	\$13.76	\$13.76
Capital Expenses (millions)	\$0.78	\$1.44	\$1.44	\$1.44
<b>Total Expenses</b> (millions)	<b>\$8.18</b>	<b>\$15.20</b>	<b>\$15.20</b>	<b>\$15.20</b>
Ridership	78,673	82,400	89,400	135,200
<b>Total Revenue</b> (millions)	<b>\$3.20</b>	<b>\$3.35</b>	<b>\$3.64</b>	<b>\$5.50</b>
<b>Required State Support</b> (millions)	<b>\$4.98</b>	<b>\$11.85</b>	<b>\$11.56</b>	<b>\$9.70</b>

## 3.5 Implementation

Table 3.6 indicates the estimated costs, funding sources, timing, and the agencies and/or other organizations that will lead or support the implementation of each initiative in the recommended freight and passenger rail program. **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. These initiatives make the location-specific ones more effective. Very general hours per week are included for thinking about whether such initiatives can be accomplished by existing staff or whether additional human resources are needed.

**TABLE 3.6 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
<b>First Priority Set by Goal Area</b>							
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	Upgrade all State-owned freight rail lines to efficiently accommodate industry-standard 286,000 lbs. (286k) railcars	Freight	Short to Long-term	\$131.1 million (includes ID# 112, 113, 115)	\$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
<b>Second Priority Set by Goal Area</b>							
116	Burlington Rail Yard Enterprise project	Both	Long-term	Up to \$22.6 million	Unknown		City of Burlington, CCRPC, VTrans, FHWA

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
18	Seek grants and innovative funding approaches for freight and passenger rail	Both	Short-term			3 hours/week on average--variable (including to prepare applications), ongoing	VTrans, Freight Railroads
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	\$13.6 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
127	Work to reduce causes of delay to <i>Ethan Allen Express</i> and	Passenger	Long-term			2 hours/week, ongoing	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
	Vermont service within and beyond Vermont's borders.					(analysis, meetings)	
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
<b>Third Priority Set by Goal Area</b>							
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. This track work would be necessary to pursue Initiative 104. 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

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
103, 126	Improve track on NECR Winooski Branch between Burlington and Essex Junction for freight. This track work would be necessary to pursue Initiative 103, Extend <i>Ethan Allen</i> Amtrak service to link with <i>Vermont</i>	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 them. Facilitate development of additional freight transload locations in or near Vermont	Intermodal Connectivity	Short-term			3 hours/week (outreach, meetings), ongoing	VTrans, Freight railroads, Economic 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

## APPENDIX A. COST ESTIMATES FOR CAPITAL INITIATIVES

Order-of-magnitude capital cost estimates were prepared for the recommended first-, second-, and third-priority initiatives that would require capital investments in order to implement. The methodology and information sources used to develop each estimate are described in the discussion of each initiative.

### *Initiatives 100 and 102 – Extend Vermonter to Montreal:*

At this point, VTrans has not identified any infrastructure needs in Vermont to accomplish this initiative. Capital costs for extending the *Vermonter* to Montreal are expected to be refined in a study to be completed in 2022. Operating costs would be explored in a future study.

### *Initiative 111 – Passenger Rail Station Improvements*

Although passenger rail stations have been improved to be ADA accessible, there are still a number of stations that need upgrades ranging from cosmetic to providing better functionality. VTrans is currently midway through an effort to inventory stations and develop a cost estimate for the needs identified at each station. No estimate is available at this time, however, an estimated cost of \$5 million is being carried for this initiative until additional information is available.

### *Initiative 2 – Upgrade all State-owned freight rail lines to be able to carry the industry-standard rail carweight of 286,000 lbs (286K)*

The sum of estimates for bridge work on state-owned freight rail lines (listed below) is \$46.5 million. The sum of the estimated track work required on state-owned freight rail lines is \$84.3 million. Thus, the total estimate to upgrade all state-owned freight rail lines is \$130.8 million.

### *Initiative 112 – Upgrade GMRC Bridges and Track to be able to carry the industry-standard rail carweight of 286,000 lbs (286K)*

Previous Rail Plan carried an estimate of \$46.2 million for the GMRC bridges and \$18.5 million for the required track upgrades. Adjusted for inflation results in an estimate of \$50.8 million and \$20.4 million.

VHB conducted an estimate for the GMRC Bridges and Track. Based on data in the initiative spreadsheet, there are eight remaining GMRC bridges and 17.9 remaining miles of track to be upgraded. VHB estimated that the GMRC bridges would cost \$12 million based on an average order of magnitude cost of \$1 million per bridge for seven of the bridges and a \$5 million cost for Bridge 145. Based on costs of installing continuous welded rail on recent projects, a cost of \$1 million per mile was applied to the 17.9 miles of GMRC track to result in a cost of \$18 million for GMRC track. VHB would recommend a revised total estimate for the GMRC upgrades of \$30 million.

### *Initiative 122 – Phased Deployment of gates/flashers at existing and planned Amtrak public road grade crossings*

An estimated cost of \$500,000 per crossing applied to the 80 crossings would result in a total estimated cost of \$40 million (would not need to upgrade all the crossings on VTR Northern to gates and flashers as a lot of crossings were upgraded). VTrans gets \$3 million per year towards this effort and can also use HSIP funds to pay for some locations.

### *Initiative 116 - Burlington Railyard Enterprise Project*

CCRPC scoping study estimated that rail mitigation for this project at \$6.5 million, but 2015 Rail Plan estimated cost at \$10 million. Later CCRPC estimates included significant roadway infrastructure costs. Adjusting the \$10 million estimate for inflation results in a current estimate of \$11 million. The Phase II Supplemental Scoping document published in August 2020 produced a cost estimate range of \$18 million to \$22.6 million. The top end of that range will be used as the estimate for this plan.

### *Initiative 115 - Upgrade WACR Connecticut River Division Bridges and Track*

The 2015 Rail Plan carried an estimated cost for the upgrade of the WACR Connecticut River Division bridges at \$60.1 million and track at \$22.5 million. Including inflation would result in an estimate of \$66.1 million for WACR Connecticut River Division bridges and an estimate of \$24.8 million for WACR Connecticut River Division track. VTrans now has load ratings on each of the bridges that were not available when the 2015 Rail Plan was completed. With these load ratings, the estimates have been fine-tuned. In addition, a number of bridge projects have occurred on this line since that time.

A review of the bridges along the WACR Connecticut River Division results in an estimate of approximately \$1.5 million per bridge. Although this estimate is high for most, there are some bridges with longer spans and/or that need to be replaced resulting in the average cost. With 21 bridges that do not currently meet the 286-kip load rating, an estimate of \$30 million would be appropriate in order to address the bridges remaining in this corridor.

Approximately 52 miles of the WACR Connecticut River Division would need to be brought up to 115 lb. continuous welded rail at an estimated cost (based on recent bid prices) or \$1 million per mile of track upgrade. Adding in 10% estimate for ballast results in a total estimate of \$57.2 million, which is substantially higher than the estimate in the previous Rail Plan.

### *Initiatives 104 & 110 – Albany-Bennington-Burlington Freight Rail & Passenger Service*

The 2015 Rail Plan included an estimate for this initiative of \$88 million. Adjusting that estimate for inflation would result in an estimate of \$97.7 million. A number of the improvements required for this initiative have been completed as a part of the Western Corridor. The 2014 New York- Vermont Bi-State Intercity Passenger Rail Study included a rail infrastructure cost for the Albany to Rutland route via the western corridor at approximately \$62 million from North Bennington to Rutland and a station cost of \$4 million for North Bennington and Manchester stations.

This initiative requires improvements to track from Bennington to Rutland plus the connection to Hoosick for an approximate distance of 60 miles. Of that, approximately 26 miles would be upgraded to continuous welded rail (CWR) at \$1 million per mile resulting in an estimate of \$26 million. The remaining 34 miles

would require ties, tie plates, spikes, etc. at an estimated cost of \$200,000/mile or approximately \$7 million. Added to these costs is approximately 10% for ballast, etc. Although highway-rail crossings were not highlighted when this initiative was discussed, the cost to upgrade the 43 highway-rail crossing locations would be approximately \$20 million dollars was included. The resulting total for rail and crossing improvements would be approximately \$55 million plus the station cost of \$4 million.

### *Initiatives 103 and 126 – Track Improvements for Freight and Potential Ethan Allen Express Extension from Burlington to Essex Jct.*

An estimate of costs for this initiative was \$26.4 million in the 2015 Rail Plan.

G&W has fine-tuned the estimated costs for these upgrades. G&W has indicated that eight miles of continuous welded rail would need to be installed with an expected cost of \$6.4 million for the rail, ties, face surfacing, and ballast. G&W has indicated that the tunnel along that route does not need improvements, but that the bridges along this route are rated 263K and would require upgrades.

A review of the lengths and types of bridges required to be upgraded in this area (truss and thru girder bridge spanning less than 100') results in an estimated cost of \$1.0 million each for the rehabilitation for a total of \$3.0 million. This assumes no substructure work and does not require a full superstructure replacement. In addition, an additional \$500,000 has been included to upgrade and replace existing culverts.

There are 8 at grade rail crossings that will require some sort of upgrades, either gates and signals or gates and upgraded signals. Recent crossing upgrades have cost between \$400,000 and \$500,000 per crossing. At an order-of-magnitude cost of \$500,000 per crossing for 8 crossings results in a total crossing cost of \$4 million.

Total Cost to upgrade the Winooski Sub would be \$14 million based on this estimate.

### *Initiative 113 – Upgrade WACR Montpelier & Barre Subdivision Bridges and Track*

The 2015 Rail Plan included an estimate for this initiative of \$4.31 million. Adjusting that estimate for inflation would result in an updated estimate of \$4.8 million.

However, using the cost-per-mile for continuous welded rail provided by VTrans (\$1 million per mile), plus a 10% cost for additional ballast, and the projected 2022-2024 cost for remaining bridge rehabilitation projects programmed in the FY 2022 budget (approximately \$622,000), the total cost to upgrade this for freight use is \$9.1 million.

In addition, 3 bridges require replacement, at an estimated cost of \$1.5 million each, or \$4.5 million in total.

Thus, the total cost of improvements in this corridor is estimated to be \$13.6 million.

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iVTrans. *Revamping VTrans' Project Selection & Prioritization Processes Update*. (2019).

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ii New York-Vermont Bi-State Intercity Passenger Rail Study. (2014).

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iii <https://vtrans.vermont.gov/sites/aot/files/portal/documents/aboutus/capprog/21/2AGENCYOFTTRANSPORTATIONSUMMARY.pdf>