

# Service Development Plan

Prepared for



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Albany, NY 12232**

Prepared for



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**New York – Vermont Bi-State  
Intercity Passenger Rail Study**



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# 1

## Purpose and Need

The New York-Vermont (NY-VT) Bi-State Intercity Passenger Rail Study project is an initiative of the Vermont Agency of Transportation (VTrans) and the New York State Department of Transportation (NYSDOT) to identify and establish an efficient, intercity passenger rail-based transportation link that will benefit unserved and underserved communities in southwestern Vermont (VT) and eastern central New York (NY).

Southwestern Vermont and eastern central New York (Figure 1-1) have limited transportation options. Communities have no direct access to the interstate highway system or a major airport, limited intercity passenger rail service, and limited intercity bus service. This condition has been, and continues to be, a hardship for residents and an impediment to economic development in the region.

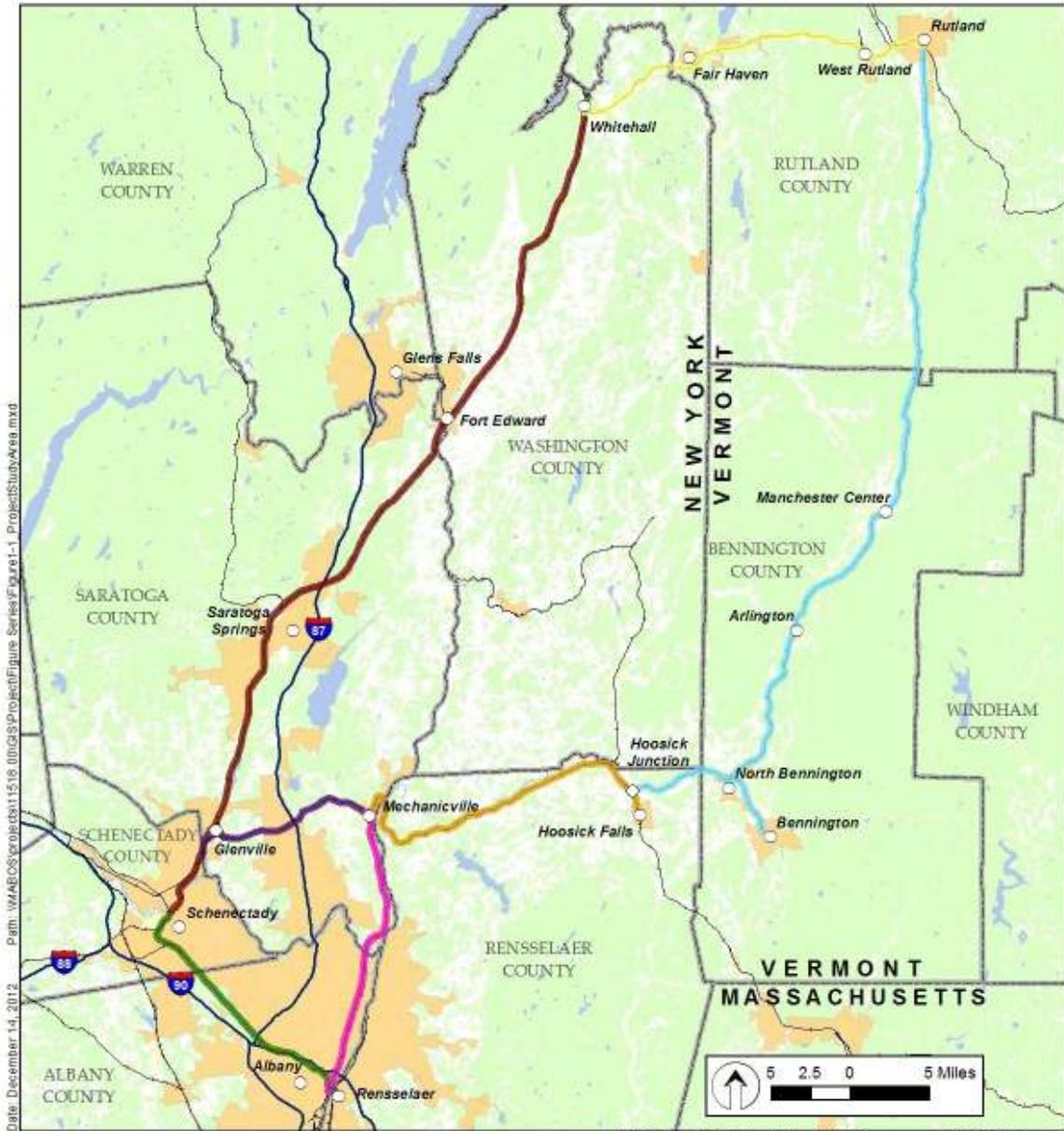
This chapter defines the Purpose and Need of the NY-VT Bi-State Intercity Passenger Rail project and identifies the project goals.

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### 1.1 Project Purpose

The purpose of this project is to identify and establish an efficient, intercity passenger rail-based transportation link that will benefit unserved and underserved communities in southwestern Vermont and eastern central New York.

# New York – Vermont Bi-State Intercity Passenger Rail Study



Date: December 14, 2012 Path: \\VIA\GIS\projects\11518\_00\GIS\Project\Figure\_Series\Figure\_1\_ProjectStudyArea.mxd

**Legend**

- Potential Host Railroads**
- Canadian Pacific Rail Albany to Mechanicville (Colome Subdivision)
  - CSX Albany to Schenectady (Hudson Subdivision)
  - Canadian Pacific Rail Mechanicville to Schenectady (Freight Subdivision)
  - Canadian Pacific Rail Schenectady to Whitehall (Canadian Subdivision)
  - Pan Am Southern line Hoosick Jct. to Mechanicville (Freight Main Line)
  - Clarendon & Pitsford Whitehall to Rutland (CLP Main Line)
  - Vermont Railway Rutland to Bennington/Hoosick Jct. (B&R Subdivision)
- Other Railroad
  - County Boundary
  - Urbanized Area
  - City/Town
  - Interstate Highway

**NY - VT Bi-State Intercity Passenger Rail Study**

**Figure 1-1**  
Project Study Area

Source: New York State GIS Clearinghouse (NYGIS), Vermont Center for Geographic Information (VCGI), The United States Geological Survey National Map, and Environmental Systems Research Institute (ESRI) Data



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## 1.2 Need for Intercity Passenger Rail Improvements

Southwestern Vermont and eastern central New York have limited transportation options. Communities within the project study area have no direct access to the interstate highway system or a major airport, limited intercity passenger rail service, and limited intercity bus service. This condition has been, and continues to be, a hardship for residents and an impediment to economic development in the region.

The Capital District of New York is the gateway to the project study area from the south, both for highway as well as passenger rail access. Albany/ Rensselaer Station provides connections to other services in the northeast and beyond. Schenectady is the secondary rail hub from which passenger rail service extends north with the Adirondack and Ethan Allen Express services and west via the Lake Shore Limited. Schenectady is also the highway hub with Interstate 88 (I-88) and I-90 providing access westward and I-890 linking Schenectady and Albany. Access from these regional centers to the eastern portion of the project study area (the Western Corridor of Vermont) is lacking.

I-87 provides north-south access to the communities in the New York State portion of the corridor, connecting Glen Falls, Fort Edward, and Saratoga Springs with Albany and Schenectady. The Western Corridor of Vermont – comprising the eastern half of the project study area – has no equivalent highway access to these regional centers. US Route 7 – a roadway that has limited 4-lane segments but is mostly a 2-lane unlimited access roadway – is the only major north-south connection for those living in the Western Corridor.

Passenger rail access to the project study area is provided by the Ethan Allen and Adirondack Amtrak services. The Ethan Allen service terminates in Rutland, VT, but the balance of the Western Corridor of Vermont has no passenger rail service, nor does Mechanicville, NY.

The lack of adequate access to the eastern half of the project study area not only hinders its residents from being able to travel within the Vermont portion of the project study area easily, it is also an impediment to attracting travelers. This is a significant need because tourism plays a major role in the regional economy.

Approximately four million residents in the New York City metropolitan area do not own a personal automobile and rely heavily on intercity passenger rail to travel the region. A rail connection to the Vermont



portion of the project study area could provide an extremely attractive option, based on both cost and travel time, for these potential travelers. Connecting the entire study area to this type of buying power could stimulate significant economic development.

Intercity passenger rail improvements are needed within the project study area for the following reasons:

- ▶ Improved access to the eastern portion of the project study area from the south beyond the project study area is essential to support the tourism industry, a key economic engine for the project study area;
- ▶ Access from the eastern portion of the project study area to/ from commercial centers, educational, medical and cultural facilities in the project study area is not an option by rail; and
- ▶ Highway access within the eastern portion of study area is limited to a single roadway that operates as a local road for substantial portions of its length.

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## 1.3 Goals and Objectives

The states of Vermont and New York have identified a series of broad transportation goals to improve the quality and equity of transportation services within the region. The 2006 Vermont State Rail and Policy Plan<sup>1</sup> identified two priorities for intercity passenger rail: 1) continued service along routes currently served by Amtrak; and 2) new intercity passenger rail service along the Vermont Railway between Hoosick, NY and Burlington, VT. The 2009 New York State Rail Plan<sup>2</sup> identified numerous projects along the Empire Corridor, which runs between New York City and Niagara Falls, NY and is one of ten federally designated high speed rail corridors in the United States, including three priority projects within the Albany area, which would facilitate increased rail service to Saratoga Springs, NY and from southwestern Vermont through Mechanicville, NY.

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<sup>1</sup> State of Vermont, State Rail & Policy Plan, December 2006. Available at <http://railroads.vermont.gov/railpolicyplan.htm>.

<sup>2</sup> New York State Rail Plan 2009 – Strategies for a New Age, February 2009. Available at <https://www.nysdot.gov/divisions/policy-and-strategy/planning-bureau/state-rail-plan>.

The mapped system in the 2009 Vision for the New England High Speed and Intercity Rail Network<sup>3</sup> identifies existing service and potential services within the project study area, including the Western Corridor in Vermont and nearby New York communities. This region is considered an important geographical area and link to the overall rail system because it will provide direct intercity passenger rail connections to communities in southwestern Vermont, which will advance the goal of a continuous, integrated rail system in New England.

This project would aid both New York and Vermont in meeting their strategic rail transportation goals, and would improve intercity passenger rail access to those communities which are currently underserved or not served at all. Additionally, improved service, routing, infrastructure improvements, and travel times could result in significant increases in ridership between southwestern Vermont and Albany, NY. The goals, associated objectives, and potential evaluation measures for the project include to:

- Extend Intercity Passenger Rail Access and Improve Mobility
- Support Economic Development and Sustainable Development
- Maximize Transportation Efficiencies
- Protect Environmental Quality

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<sup>3</sup> Vision for the New England High Speed and Intercity Rail Network, July 2009. Available at <http://www.mass.gov/Agov3/docs/PR071309.pdf>.



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# 2

## Alternatives Analysis

Over the course of this study, many alternatives were developed with the potential to improve the existing rail network in eastern central New York and southwestern Vermont. During Phase One, all feasible alternatives were studied to determine transportation, environmental, and cost factors. The two alternatives with the highest potential were reevaluated in a more thorough Phase Two process, and a Preferred Alternative was ultimately selected.

The No-Build Alternative was also carried through the Phase Two assessment as a baseline. It consists of the existing transportation systems plus currently planned and programmed track and service improvements in the project study area through the long-range planning horizon (year 2030). NEPA requires the assessment of a No-Build Alternative as a baseline against which the potential effects of proposed alternatives are evaluated. The No-Build Alternative is evaluated to identify the operational and environmental effects on the study area if no action is taken.

---

### 2.1 Phase One Alternatives

Six initial alternatives were developed for the project. These alternatives were established through a review of previous studies<sup>4</sup> and planning efforts as well as a collaborative workshop. The initial alternatives were broadly defined to ensure that all potentially feasible alternatives were considered and evaluated. All six of the alternatives would rely on existing, active rail lines within the study area. These rail lines are

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<sup>4</sup> Albany/Bennington/Rutland/Burlington Rail Passenger Service Study, VAT, 1998; Vermont Western Corridor Study – Report to Congress, 2000; Comparative Analysis of Transp. Needs in 4 Areas of VT (VT Transp. Board), 2004; Albany/Bennington/Rutland/Burlington Project, VTrans, 2004; VT State Rail & Policy Plan, 2006; NY State Rail Plan, 2009; Vision for the New England HSR and Intercity Rail Network, 2009; NY-VT HISPR Track 3 Application, 2009; Ethan Allen HSIPR Track 2 Application, 2009; Vermont Western Corridor Management Plan – Report to Congress, 2010; Projected Improvements to the Vermont Railway Western Corridor, 2010

primarily used for the movement of freight. Based on the results of the Phase One Screening, two Build Alternatives were recommended to advance to the Phase Two Screening process:

- Alternative 4 – New Service to Rutland
- Alternative 5 – Rerouted Ethan Allen Service

The evaluation and results of the Phase One Alternatives are discussed in detail in the Identification and Evaluation of Alternatives – Phase One technical memorandum in Appendix A.

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## **2.2 Phase Two Alternatives**

The focus of the Phase Two analyses and screening process was to identify the Preferred Alternative for the project. In the Phase Two Screening, the No-Build Alternative and Alternatives 4 and 5 were evaluated in terms of:

- Capital costs;
- Operations and maintenance costs;
- Ridership estimates;
- Operational Analysis/ Operating Plans; and
- Environmental impacts.

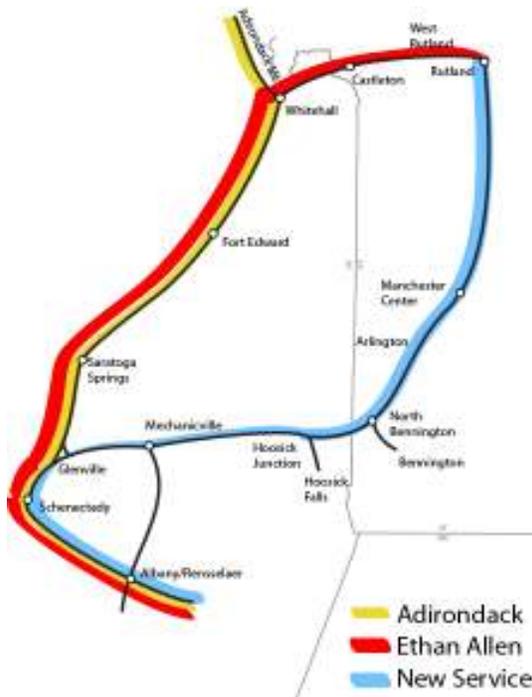
Each of the Phase Two alternatives are described and illustrated as follows.

Figure 2-1 No-Build Alternative



The No-Build Alternative includes the existing transportation systems plus currently planned and programmed track and service improvements in the project study area through the long-range planning horizon (year 2030). The National Environmental Policy Act (NEPA) requires including the No-Build Alternative in the evaluation of alternatives. It is evaluated to identify the operational and environmental effects on the study area if no action is taken. To meet this NEPA requirement, the No-Build Alternative was advanced to this second phase of the screening process so it can be compared to the final Build Alternatives. Figure 2-1 provides a schematic drawing of the No-Build Alternative.

Figure 2-2 Alternative 1 - New Service to Rutland



Alternative 1 (formerly Alternative 4 under the Phase One Screening) would extend service to southwestern Vermont, with a terminus in Rutland, VT. Figure 2-2 is a schematic map of the New Service to Rutland Alternative.

The alternative would operate out of Albany/ Rensselaer, NY station connecting to new stations in Mechanicville, NY and North Bennington and Manchester, VT, en route to a terminus in Rutland, VT. Alternative 1 would operate one round trip per day.

Alternative 1 proposes a through service, with no transfer needed for service beyond Albany/ Rensselaer, NY, along the Empire Corridor. To operate Alternative 1 as a through service, it is proposed that an existing Empire

Corridor train that currently terminates at Albany/ Rensselaer, NY be extended to Rutland, VT.

In Alternative 1 the Ethan Allen and Adirondack services would continue to operate on the same routes and frequencies (one round trip per day for both) as they do now. Alternative 1 would provide new service to Mechanicville, NY and North Bennington and Manchester, VT.

**Figure 2-3 Alternative 2 - Reroute Ethan Allen**



Alternative 2 (formerly Alternative 5 under the Phase One Screening) proposes re-routing the existing Ethan Allen service through southwest Vermont. The alternative would operate between Rutland, VT and Albany/ Rensselaer, NY through southwest Vermont with stops in Mechanicville, NY and North Bennington and Manchester, VT. Figure 2-3 is a schematic map of the Rerouted Ethan Allen Service Alternative.

Alternative 2 also proposes a through service, to New York City. Similar to existing Ethan Allen Service, no transfer would be needed for service beyond Albany/ Rensselaer, NY along the Empire Corridor.

As part of Alternative 2, the existing Adirondack service would continue to operate on the same route and at the same frequency (one round trip per day) as it does now. The rerouted Ethan Allen service would operate one round trip per day.

With this alternative, service to Castleton, VT would be eliminated while service to Mechanicville, NY and North Bennington and Manchester, VT would be added. This alternative would reduce service to one train per day in each direction (Adirondack service only) at Saratoga Springs and Fort Edward.

Based on the compiled analyses, a detailed assessment of each alternative was performed as part of the Phase Two screening. The Phase Two Alternatives, screening process, and results are discussed in detail in the Identification and Evaluation of Alternatives – Phase Two technical memorandum, which can be found in Appendix B.



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## Summary of Environmental Impacts

A Service Level analysis identified the existing conditions along each segment comprising the Preferred Alternative and the potential impacts of the No-Build Alternative and the Preferred Alternative for the following resources:

- Transportation
- Air quality
- Noise
- Vibration
- Water resources
- Wetlands
- Floodplains
- Ecological systems
- Threatened and endangered species
- Land use
- Socio-economic environment
- Environmental justice
- Public health and safety
- Cultural resources
- Section 4(f) and Section 6(f)
- Energy and natural resources
- Visual and aesthetic resources

Potential construction period impacts to air quality, noise, vibration, and water resources were also evaluated.

Because the project, at this stage of development, would extend outside the existing rail ROW only at the proposed station locations, this evaluation concluded that there is a negligible to low potential for the project to result in adverse impacts to natural resources. The human resources present within the project study area would not be adversely affected by the project, as the new service would follow existing rail lines, not disrupting communities in any substantive way. The Preferred Alternative would not result in substantive direct, indirect, or cumulative adverse impacts to natural resources or the human environment.

The construction period impact analysis concluded that the project would not result in any significant short-term impacts to environmental resources when regulations and ordinances are complied with and mitigation measures are used.



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## 2.3 Preferred Alternative

Alternatives 1 and 2 were weighed against one another by using the four goals established in the Project Rationale in Section 2.3. The goals are:

- Goal 1: Improving access and mobility in the region;
- Goal 2: Supporting economic growth and sustainable development;
- Goal 3: Providing an efficient and attractive transportation option;  
and
- Goal 4: Promoting energy efficiency and enhanced environmental quality.

The No-Build Alternative was used as a baseline from which to draw conclusions. Evaluation of each alternative by goal revealed the following trends:

- Both Build Alternatives propose adding service in the Western Corridor of Vermont, but **Alternative 1 best satisfies Goal 1** because it adds service to new segments of the study area without removing service from any existing station areas. Under Alternative 2, service would still be available along much of the existing Ethan Allen alignments – via the Adirondack Service; however, there would be one less roundtrip available for portions of the current Ethan Allen alignment. Castleton will no longer be served directly by passenger rail.
- **Alternative 2 best satisfies Goal 2**, due in major part to the cost difference associated with running two services (Alternative 1) versus one service (Alternative 2). Alternative 2 outperforms both the No-Build and Alternative 1 in terms of the net cost per rider and the subsidy that would be required to support the service.
- **Alternatives 1 best satisfies Goal 3**, and is anticipated to slightly better support economic development and sustainable development. The major driver for both of these objectives will be the placement of new stations, which will be the same for both Alternatives. The removal of one round trip, as is proposed under Alternative 2, may have some negative impact to economic development at the stations where service is reduced.
- Both Alternative 1 and 2 are expected to have a similar (minimal) impact on the environment. It should be noted that both Build

alternatives would also have potential for reduced traffic and improved air quality due to a reduction in annual VMT

Based on the Phase Two evaluation and as shown in Table 2-1, Alternative 1 was identified as the Preferred Alternative recommended for further development.

**Table 2-1 –Summary of Evaluation Scores**

|   | No-Build | Alt. 1                            | Alt. 2     |
|---|----------|-----------------------------------|------------|
| <b>GOAL 1 – Extend Intercity Passenger Rail Access and Improve Mobility</b> |          |                                   |            |
| Directness to Key Regional Destinations                                     | 0        | +2                                | +1         |
| Transfers Required  | 0        | +2                                | +1         |
| Cumulative Travel Time  | 0        | 0                                 | 0          |
| Availability of Intermodal Connections                                      | 0        | +2                                | +1         |
| Frequency/Ridership/Population  | 0        | +2                                | +1         |
| <i>Goal 1 Total:</i>  | <i>0</i> | <i>+8</i>                         | <i>+4</i>  |
| <b>Best Fit Alternative:</b>  |          | <b>X</b>                          |            |
| <b>GOAL 2 – Support Economic Development and Sustainable Development</b>    |          |                                   |            |
| Accessibility/Connections   | 0        | +2                                | +2         |
| Smart Growth  | 0        | +2                                | +1         |
| <i>Goal 3 Total:</i>  | <i>0</i> | <i>+4</i>                         | <i>+3</i>  |
| <b>Best Fit Alternative:</b>  |          | <b>X</b>                          |            |
| <b>GOAL 3 – Maximize Transportation Efficiencies</b>                        |          |                                   |            |
| Cost Evaluation   | 0        | -2                                | +2         |
| Construction Impacts on Operations  | 0        | -1                                | -1         |
| Sustainability/Funding Opportunities  | 0        | -1                                | 0          |
| Additional Capacity   | 0        | +2                                | +1         |
| Reliability/Flexibility   | 0        | +2                                | +1         |
| Impacts to Rail and Bus Operations  | 0        | +2                                | +1         |
| <i>Goal 2 Total:</i>  | <i>0</i> | <i>+2</i>                         | <i>+6</i>  |
| <b>Best Fit Alternative:</b>  |          |                                   | <b>X</b>   |
| <b>GOAL 4 – Protect Environmental Quality</b>                               |          |                                   |            |
| Environmental Impacts   | 0        | -1                                | -1         |
| <i>Goal 4 Total:</i>  | <i>0</i> | <i>-1</i>                         | <i>-1</i>  |
| <b>Best Fit Alternative:</b>  |          | <b>Alternatives 1 &amp; 2 tie</b> |            |
| <b>TOTAL</b>  | <b>0</b> | <b>+13</b>                        | <b>+10</b> |
| <b>Best Fit Alternative:</b>  |          | <b>X</b>                          |            |



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# 3

## Market Analysis and Ridership

Chapter 3 presents the travel demand forecasting methodology including ridership and revenue projections for the Preferred Alternative. The No-Build Alternative is provided for comparison purposes.

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### 3.1 Travel Times

The Rail Traffic Controller TM (RTC) software model's Train Performance Calculator (TPC) was used to simulate one northbound and one southbound train between Albany and Rutland along the proposed route. The TPC runs are discussed in detail in the Summary of Simulation Assumptions and TPC Results technical memorandum, which can be found in Appendix C.

TPC runs were performed between Albany and Rutland in each direction. The train set used included one P42-DC locomotive pulling five coach cars. Table 3-1 summarizes the proposed service between Albany and Rutland.

**Table 3-1 – Summary of Travel Time**

| <b>Northbound</b> |      |
|-------------------|------|
| Albany            | 0:00 |
| Schenectady       | 0:18 |
| Mechanicville     | 0:55 |
| North Bennington  | 1:32 |
| Manchester        | 1:58 |
| Rutland           | 2:39 |
| <b>Southbound</b> |      |
| Rutland           | 0:00 |
| Manchester        | 0:42 |
| North Bennington  | 1:09 |
| Mechanicville     | 1:46 |
| Schenectady       | 2:26 |
| Albany            | 2:49 |

The TPC runs show the effects of the physical geographic features and the positive influence of capital projects on the different corridor segments. In some segments, the northbound and southbound runtimes may be different due to long segments of increasing elevation, acceleration and deceleration rates, differences in Maximum Authorized Speed (MAS), or scheduled traffic on the line.

## 3.2 Ridership Projections

The Preferred Alternative service would be provided to Rutland via the “Western Corridor” while retaining the Ethan Allen service – which provides service to Rutland through New York and would be rerouted from Albany to Mechanicville via Schenectady.

The ridership forecasts were developed using an analytical procedure considering the following:

- Existing demographic and economic conditions in study area;
- Forecasted demographic and economic conditions in the study area;
- Rail ridership of existing services in the region, specifically the ridership of the Adirondack and Ethan Allen services operated by Amtrak;

- Ridership for station pairs served by the Adirondack and Ethan Allen services;
- Service level and fare of existing and proposed rail service in the region; and
- Travel time, operating costs and toll costs of automobile drivers or passengers in the region.

The study area was divided into traffic districts, each representing the catchment area of an existing or proposed rail station. For the purposes of the ridership analysis, the catchment areas were defined as the 10-mile buffer around each station. If a portion of a town fell within 10 miles of a station it was assigned to a station. Towns that fell within 10 miles of two stations were assigned to the closest station. The ridership forecasting procedure was based on district-to-district travel.

The ridership model was then refined to reflect:

- **Updated (train) travel times.** The travel times used in the refined model were based on the Rail Traffic Controller (RTC) model. The infrastructure used in the model was prepared to run the model's Train Performance Calculator (TPC) which calculated travel times between station based on the operating speeds of the train, the tractive effort and braking, station stops and cumulative travel times. The times used for the original ridership analysis were calculated based on distance between stations, assumed Maximum Authorized Speed (MAS), and a (conservative) impedance factor that was applied across the board. The travel times generated as part of the TPC run are faster than the originally calculated times.
- **Updated fares.** For the original iteration of the ridership analysis, fares were matched to existing, published fares for Amtrak trips (Ethan Allen or Adirondack) of similar trip length for the trip pairs in the study area. The refined ridership model reflects current fares for the Ethan Allen service and incremental fares based on average cost per mile for non-Ethan Allen trip pairs.

Ridership forecasts are shown in Table 3-2.

**Table 3-2 – Ridership Projections**

| Station                     | 2010 Base     | 2030 No-Build | 2030 Alt. 1    |
|-----------------------------|---------------|---------------|----------------|
| Montreal - Fort Ticonderoga | 5,200         | 5,700         | 5,700          |
| Rutland                     | 8,300         | 10,800        | 14,900         |
| Castleton                   | 1,100         | 1,800         | 1,900          |
| Whitehall                   | 900           | 1,000         | 1,000          |
| Fort Edward                 | 4,300         | 4,600         | 4,500          |
| Saratoga Springs            | 15,100        | 16,600        | 16,500         |
| Schenectady                 | 8,100         | 8,400         | 10,300         |
| Manchester                  | --            | --            | 4,400          |
| North Bennington            | --            | --            | 6,400          |
| Mechanicville               | --            | --            | 4,600          |
| Albany/Rensselaer           | 3,200         | 3,400         | 3,700          |
| Hudson - NY Penn            | 32,400        | 35,900        | 52,100         |
| <b>Total</b>                | <b>78,600</b> | <b>88,200</b> | <b>126,000</b> |

Note: Ridership numbers reflect one-way boardings.

This projected ridership would be served by one daily roundtrip. It is not anticipated that ridership would significantly increase with additional daily trips.

### 3.3 Revenue Forecasts

Annual revenue was calculated in the ridership model for the year 2030. The forecasted revenue was prepared using current fares for existing station-to-station trips (as accessed on the Amtrak website). A similar fare structure was developed for the proposed new stations based on distance between origin and destination. The total fare revenue for each alternative was calculated by multiplying the station-to-station ridership matrix with the attendant station-to-station fare matrix. The 2014 Figures were based on the actual performance of the Ethan Allen service, factoring from the projected 2030 estimate for the No-Build Alternative. Revenue forecasts are shown in Table 3-3.

**Table 3-3 – Revenue Forecasts**

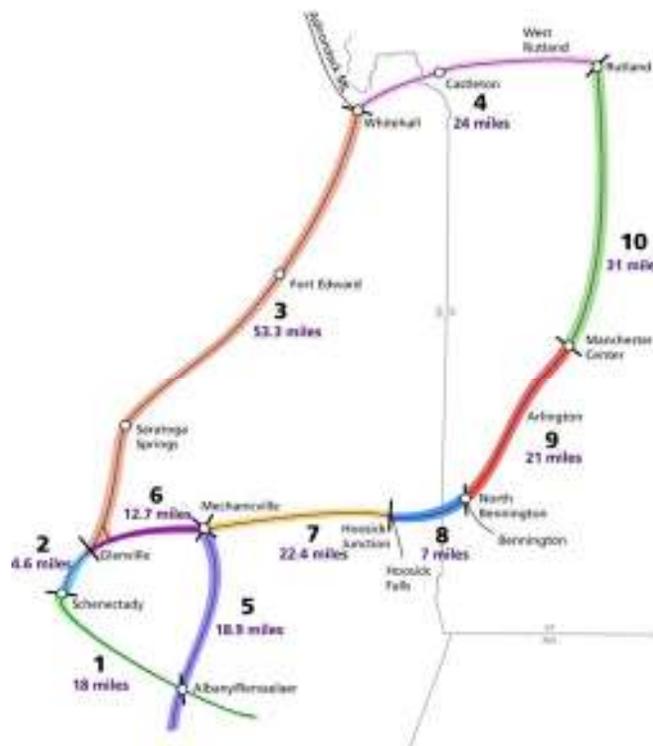
|                       | No-Build    | Alt. 1      |
|-----------------------|-------------|-------------|
| Annual Revenue (2014) | \$2,950,000 | \$4,431,000 |



# 4

## Existing Conditions

The existing rail corridors in the project study area were divided into ten segments (Figure 4-1). Freight rail service is currently operated over all ten of the rail line segments. Three different freight railroads (CSX, Canadian Pacific Railway, and Vermont Rail Systems) operate over lines they either own or lease (or have operating rights for).



**Figure 4-1: Study Segments**

Intercity passenger rail service in the project area is provided by Amtrak along Segments 1, 2, 3, and 4. There are currently three Amtrak regional routes providing intercity passenger service:



- ▶ **Empire Service** – Providing daily service between New York City, NY and Buffalo, NY with continuing service to Niagara Falls, NY and Toronto, Canada. The Empire Corridor includes Segment 1 of the project study area with stops in Albany-Rensselaer and Schenectady, NY.
- ▶ **Adirondack Service** – Providing daily service between New York City, NY and Montreal, Canada via Albany. Adirondack Service operates in Segments 1, 2, and 3 with stops in Albany-Rensselaer, Schenectady, Saratoga Springs, Fort Edward-Glens Falls and Whitehall, NY.
- ▶ **Ethan Allen Express** – Providing daily service between New York City, NY and Rutland, VT via Albany, NY. The Ethan Allen Express operates in Segments 1, 2, 3, and 4 with stops in Albany-Rensselaer, Schenectady, Saratoga Springs, Fort Edward-Glens Falls, NY and Castleton, VT.

The following sections provide an overview of each of the segments. The conditions of the existing rail and structures were not evaluated during this phase but will be examined in greater detail during future phases.

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## 4.1 CSX Hudson Subdivision (Segment 1)

CSX operates freight service on the section of track between Rensselaer and Schenectady, NY, which is part of the Hudson Subdivision that they own. This section of track (Segment 1; see Figure 4-1) is approximately 18 miles long. This line is distinct from the CSX Selkirk Subdivision which runs south of Albany and Schenectady serving a major rail yard and automotive distribution center in Selkirk. It also serves a bulk transloading facility in Albany. Amtrak has a 25 year long-term lease for operating rights over the CSX Hudson Subdivision.

The line connects to the CSX Selkirk Subdivision at the west end at CP-169, providing access towards Buffalo. In Albany, it connects to Amtrak's Post Road Subdivision at CP-142, which provides access towards Massachusetts. The Hudson Subdivision connects with Canadian Pacific Railway's Colonie Subdivision (described in Section 4.2) in downtown Albany at CP-145; however, the only direct moves provided for are moves between the south and the west. Trains coming from the Albany-Rensselaer station are not able to make direct moves onto the CP Colonie Subdivision heading north. The Hudson Subdivision connects to the CP Freight Subdivision in downtown



Schenectady at CP-160, with movements allowed between the south and the west, and between the north and the east.

The Hudson Subdivision is mostly single track, with short double track segments in Rensselaer, Albany, and Schenectady, NY. There are also several long freight sidings. Work has started to double track the line between Albany and Schenectady, anticipated to be completed in 2016. The line is maintained for passenger speeds of up to 110 mph and freight speeds of 50 mph. Geometric restrictions in the urban areas result in several speed restrictions. In Rensselaer, around the Albany/ Rensselaer station, the passenger train authorized speeds are reduced to 15 mph and freight train speeds down to 10 mph. Through Albany, both the passenger and freight authorized speeds are 20 to 25 mph. Approaching Schenectady Station, passenger train authorized speeds are reduced to 55 mph from the east and 50 mph from the west, before dropping to 30 mph in the station area. The freight train authorized speed is reduced to 30 mph throughout Schenectady. The track is maintained to FRA Class 5 standards.

The line is signaled with automatic block wayside signals with cab signals under centralized traffic control (CTC). In the section of track between Rensselaer and Schenectady, there are three highway-rail grade crossings equipped with automatic warning devices at Lincoln Avenue, Morris Road, and Cordell's Road.

Existing train operations on Segment 1 include more than six daily freight round trips, as well as six daily round trip passenger trains associated with the Adirondack, Empire, Ethan Allen, Lake Shore Limited, and Maple Leaf services operated by Amtrak. Other transportation options include local bus service provided by the CDTA and regional connecting service provided by Adirondack Trailways; major roadway connections via I-90, I-87 and I-890; and access to domestic and international flights at Albany International Airport.

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## 4.2 Canadian Pacific Railway (Segments 2, 3, 5, and 6)

Canadian Pacific Railway (CP) operates freight services over three subdivisions they own in the project study area.

### Freight Subdivision

CP operates freight service on the Freight Subdivision, the section of track between Mechanicville and Schenectady, NY (Segments 2 and 6; see Figure 4-1). This section of track is approximately 17 miles long. The

line serves a yard at Schenectady. Pan Am Railways and Norfolk Southern have operating rights over this section.

In Mechanicville, the Freight Subdivision connects at CPF-467 with the CP Colonie Subdivision to the south and Pan Am Railway's (PAR's) Freight Main Line to the east. From Mechanicville, the Freight Subdivision runs west to CPF-478 and CPF-480, where it connects to CP's Canadian Connector Subdivision and Canadian Subdivision to the north. Direct connections are provided for all moves, with the Canadian Connector Subdivision being a short track that is functionally one leg of the wye.<sup>5</sup> In addition, a separate spur track controlled by PAR, the Rotterdam Branch, continues west to the CSX Selkirk Subdivision at Rotterdam Junction. From Glenville, the branch continues southwest through Schenectady, where it connects to CSX's Hudson Subdivision (described in Section 4.1) at CPF-485. Connections exist to allow moves between the south and the west, and between the north and the east. The line continues all the way to Wilkes-Barre, Pennsylvania.

The Freight Subdivision is mostly single track, with one controlled siding in Crescent. The track is maintained for passenger and freight speeds of 40 to 50 mph. In Mechanicville and Schenectady, geometric restrictions limit the authorized speeds to 25 mph. The line is signaled with automatic block wayside signals under CTC.

Segment 2 runs 4.6 miles from Schenectady, NY to CPF-480 along the Freight Subdivision. The segment is single track and is currently maintained to FRA Class 3 standards. The line is signaled with automatic block wayside signals under CTC. There are three at-grade railroad crossings within this segment; all of them are public crossings.

Existing train operations on Segment 2 include more than nine daily freight round trips, as well as two daily round trip passenger trains associated with the Ethan Allen and Adirondack services. Other transportation options include local bus service provided by the CDTA and regional connecting service provided by Adirondack Trailways; major roadway connections via NY 50 and NY 146; and access to domestic and international flights at Albany International Airport.

Existing train operations in Segment 6 include three to four freight round trips per day. There is no existing passenger rail service. Transportation options include local bus service operated by the City of Mechanicville,

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<sup>5</sup> A triangular shaped arrangement of rail tracks with a switch or set of points at each corner. When used at a rail junction, it allows trains to pass from any line to any other line.

local bus service provided by CDTA, and major roadway connections via NY 67, US 9 and I-87.

This segment is single track with one 1.8-mile long controlled siding west of Elnora, NY. The line is currently maintained to FRA Class 3 standards and is signaled with automatic block wayside signals under CTC. There are eight grade crossings within this segment, consisting of six public and two private or farm crossings.

#### **Canadian Subdivision**

CP operates freight service on the Canadian Subdivision, the section of track between Glenville and Whitehall, NY (Segment 3; see Figure 4-1). This section is approximately 56 miles long. The Canadian Subdivision serves yards at Saratoga Springs, Fort Edward, and Whitehall. The yard in Whitehall is dispatched by Vermont Rail Systems although the only access is from the Canadian Subdivision. Amtrak has operating rights over this section and uses the Canadian Subdivision on the Adirondack and Ethan Allen Express routes. Freight and passenger service levels on this section will remain the same and the existing track configuration will not be altered.

#### **Colonie Subdivision**

CP operates freight service on the Colonie Subdivision, the section of track between Albany and Mechanicville, NY (Segment 5; see Figure 4-1) along the west side of the Hudson River. This subdivision is approximately 19 miles long. The line serves a major yard at Kenwood, an intermodal facility at the Port of Albany, and a bulk transloading facility in Albany. Norfolk Southern has operating rights over this section.

The Colonie Subdivision would not be used by the Preferred Alternative; this route was removed from consideration during the Phase 1 screening of the alternatives. Freight and passenger service levels on this section will remain the same and the existing track configuration will not be altered.

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### **4.3 Clarendon and Pittsford Railroad Main Line (Segment 4)**

Clarendon and Pittsford Railroad (CLP), a subsidiary of Vermont Rail Systems (VRS), operates freight service on its line between Whitehall, NY and Rutland, VT (Segment 4; see Figure 4-1). The line is approximately



24 miles long. The CLP line currently serves a yard in Whitehall, which is dispatched by VRS, despite the need to use CP's Canadian Subdivision Line to reach the yard. Amtrak has operating rights over this section, which is part of the Ethan Allen Express route. Freight and passenger service levels on this section will remain the same and the existing track configuration will not be altered.

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#### 4.4 Pan Am Railways Freight Main Line (Segment 7)

Pan Am Railways (PAR) operates freight service on the PAR Freight Main Line, which they own and which runs from Mechanicville, NY to Mattawamkeag, Maine. The section covered by this study, between Mechanicville and Hoosick Junction, is 22 miles long (Segment 7; see Figure 4-1). There are no major yards or facilities in this section, though there are several freight sidings. CP and Norfolk Southern have operating rights over this section.

At the west end, the line connects to CP's Freight Subdivision (described in Section 4.2) at CPF-467 in Mechanicville, where a direct move is only provided between the PAR Freight Main Line and the Freight Subdivision line to the west. With the existing geometry, trains coming from Albany would not be able to make a direct move onto the PAR Freight Main Line towards Vermont and Massachusetts. The line connects with the Batten Kill Railroad (a freight short line) at CPF-448 in Eagle Bridge. It connects with Vermont Railway's B&R Subdivision (described below) at CPF-445 in Hoosick Junction, with connections provided for all movements.

Segment 7 runs 22.4 miles from Mechanicville to Hoosick Junction, NY along PAR's Freight Main Line. This segment is principally single track, with 4.5 miles of double track over the Hudson River and between Eagle Bridge and Hoosick Junctions. The line is currently maintained to FRA Class 3 standards and for freight speeds of 30 to 40 mph. Geometric restrictions in the vicinity of Mechanicville result in speed restrictions of 10 mph. The line is signaled with automatic block wayside signals under CTC. There are 17 grade crossings within this segment, consisting of ten public and seven private or farm crossings.

Existing train operations on Segment 7 include eight to ten freight round trips per day. There is no existing passenger rail service. Transportation options include local bus service operated by the City of Mechanicville, and major roadway connections via NY 67, US 4 and I-87.



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## 4.5 Vermont Railway Bennington & Rutland Subdivision (Segments 8, 9, and 10)

Vermont Railway (VTR), a subsidiary of VRS, operates freight service on the Bennington & Rutland (B&R) Subdivision, which runs from Hoosick Junction, NY to Rutland, VT (Segments 8, 9 and 10; see Figure 4-1). The line is owned by the State of Vermont. The line is approximately 59 miles long and currently serves yards in North Bennington and Rutland.

At the south end the line connects to PAR's Freight Main Line (described in Section 4.4) at CPF-445 in Hoosick Junction, with connections provided for all direct moves. In North Bennington, there is an inactive spur to Bennington. Direct connections to the spur are only available from the south, so trains moving between Rutland and Bennington do not have a direct move. It does appear that this connection existed in the past and could be restored. In Rutland, the line connects to another VRS subsidiary, the Green Mountain Railroad (GMRR), a freight short line that runs east towards the Connecticut River. Direct connections are provided only for moves between the north and the east. Just beyond the GMRR connection, the line connects with another VRS subsidiary, the Clarendon and Pittsford Railroad (described in Section 4.3).

The line is mostly single track, with freight sidings in Arlington, Manchester, Danby, and South Wallingford, VT in addition to the previously mentioned yards. The line is maintained for freight speeds of 10 to 30 mph. The line is not signaled and is operated as dark territory.

Segment 8 runs 7 miles from Hoosick Junction, NY to North Bennington, VT along the B&R Subdivision. This segment is single track with no passing sidings and is currently maintained to FRA Class 2 standards. The line is not signaled and currently operates as dark territory. There are 11 grade crossings, consisting of six public and five private or farm crossings.

Existing train operations on Segment 8 include two to three freight round trips per week operated by VRS. There is no existing passenger rail service. Transportation options include local bus service provided by the GMX Brown Line, serving North Bennington and Bennington, VT, and major roadway connections via US 7, VT 7A and NY/ VT 67.

Segment 9 runs 21 miles from North Bennington to Manchester, VT along the B&R Subdivision. This segment is primarily single track, with 0.4 miles of freight sidings in North Bennington and Arlington. The line is currently

maintained to FRA Class 2 standards: it is not signaled and it operates as dark territory. There are 37 grade crossings within this segment, consisting of 16 public and 21 private or farm crossings.

Existing train operations on Segment 9 include two to three freight round trips per week operated by VRS. There is no existing passenger rail service. Transportation options include local bus service provided by the GMX Regional Route serving Bennington and Manchester, VT, and a major roadway connection via VT 30.

Segment 10 runs 31 miles from Manchester to Rutland, VT along the B&R Subdivision. The segment is primarily single track, with 0.5 miles of freight sidings in Manchester, Danby, and South Wallingford. The line is currently maintained to FRA Class 2 standards: it is not signaled and is operated as dark territory. There are 78 grade railroad crossings, consisting of 21 public crossing and 57 private or farm crossings.

Existing train operations on Segment 10 include two to three freight round trips per week operated by VRS. There is no existing passenger rail service. Other transportation options include bus service provided by the MVRTD (which provides local circulators in Rutland and service from Rutland to Manchester, VT); major roadway connections via US 7 and VT 30; and limited flight services at the Rutland-Southern Vermont Regional Airport.

Each segment was reviewed to determine the capital improvements necessary to accommodate one additional train per day to correspond with the assumptions of the alternatives. The proposed capital improvements are intended to bring all tracks in the project study area up to FRA Class 3 standards at a minimum – such that an operating speed of up to 59 mph is feasible, where geometry and operating rules allow.

In considering the routing of a new passenger rail service from southwestern Vermont to Albany/ Rensselaer, NY, two options are apparent to make the connection between Mechanicville and Albany/ Rensselaer, NY. The first option, Segment 5 in Figure 3-1, is via the Canadian Pacific Railway (CP) Colonie Line, which runs in a north-south orientation west of the Hudson River from Mechanicville to Albany/ Rensselaer, NY (CP Colonie Routing). The second option, Segments 6, 2, and 1 in Figure 4-1, is via the CP Freight Subdivision between Mechanicville and Schenectady, NY and the CSX Hudson Subdivision from Schenectady to Albany/ Rensselaer, NY (Schenectady Routing). Both

of these routing options have been evaluated at a conceptual level of definition. The CP Freight Subdivision was selected as the preferred alignment since the Colonie Line would require a new connection to be built in Albany which would be complicated and expensive.



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# 5

## Capital Improvements

There are two components to the capital investment necessary to provide the Service – costs for track improvements and costs for new stations.

- ▶ Service would be provided to Rutland via the “Western Corridor and retain the Ethan Allen service on its current alignment and adds a new service through southwest Vermont. Routing from Albany to Mechanicville would be via Schenectady. A No-Build Alternative was also analyzed as a baseline to compare to the Build Alternatives.
- ▶ To operate the proposed new service from Albany to Rutland via Schenectady and the Western Corridor, several infrastructure improvements are required to meet FRA Class 3 standards and the targeted Maximum Authorized Speed (MAS) of 60MPH (at a minimum). Preliminary engineering has been completed to identify the necessary improvements, a summary of the track improvements by segment are included in Table 5-1.
- ▶ The Rail Safety Improvement Act of 2008 (RSIA) requires all passenger trains to be outfitted with Positive Train Control (PTC) by the end of 2015. PTC will automatically stop or slow a train to avoid certain accidents if a driver is unable or fails to. The RSIA requires that the railroads develop PTC technology, and there are different methods to comply. Although great progress has been made, the technology still needs further development, and it is not expected that there will be full compliance by the date set by the RSIA. This project like all others in the country will need to implement PTC measures, however definition of the type and it’s methodology for the PTC compliance system is not part of this phase of the project. As the anticipated host railroad, Amtrak will be responsible for compliance and the type and methodology of the PTC system prior to the start of operation.
- ▶ Based on the cost estimates prepared to date, the total capital cost for track improvements and stations is forecast to be approximately \$112 Million, as presented in Table 5-3.

New stations are proposed to be constructed in Mechanicville, NY and North Bennington and Manchester, VT. Each station will have the following features:

- 425 feet long, high-level platforms adhering to ADA level boarding requirements and able to accommodate 5-car trainsets;
- Retractable platform edges that allow wide-load freight to pass without constructing a second track to bypass the platform ;
- A parking lot with at least 50 spaces;
- An automobile pick-up/ drop-off zone for passenger access to the station; and
- Sheltered waiting area.

Factors that influenced the station siting include:

- Proximity to town centers;
- Passenger/ vehicular access to and from the site;
- Potential environmental restrictions;
- Presence of sufficient tangent track to accommodate trains (both passenger and freight); and
- Land availability and need to purchase property.

Table 5-2 summarizes the station cost estimates at each station location.

**Table 5-1 Track Improvements**

| Segment                        | Anticipated Infrastructure Improvements/Assumptions   | Cost                 |
|--------------------------------|---|----------------------|
| Schenectady to CPF 480         | <ul style="list-style-type: none"> <li>700 ft of new mainline for new alignment through CPF 480;</li> <li>All existing public grade crossings will require warning system modifications;</li> <li>No track work required on existing mainline;</li> <li>50-foot wide crossings;</li> <li>Signal system costs assumes electronic in-track signal system and interlocking tie-ins;</li> <li>Aplauskill River Bridge needs upgrade to run double track; and</li> <li>Two turnouts at Aplauskill River Bridge will be retired.</li> </ul>   | \$6,150,000          |
| CPF 480 to Mechanicville       | <ul style="list-style-type: none"> <li>2.5 miles of new mainline/sidings for congestion relief;</li> <li>All existing public grade crossings will require warning system modifications;</li> <li>No track work required on existing mainline;</li> <li>50-foot wide crossings;</li> <li>Signal system costs assumes electronic in-track signal system and interlocking tie-ins;</li> <li>Two #20 crossovers, one #15 crossover, three #20 turnouts, and one #15 turnout needed. Two turnouts need to be retired; and</li> <li>Culvert at 1528+00 needs to be extended past proposed siding.</li> </ul>  | \$17,006,000         |
| Mechanicville to Hoosick       | <ul style="list-style-type: none"> <li>Three new sidings totaling 4.75 miles – assume existing two sidings need no work;</li> <li>Assumed 50-foot wide crossings</li> <li>Updates to existing signal system;</li> <li>All existing public grade crossings will require warning system modifications; and</li> <li>Six new #20 turnouts needed for sidings.</li> </ul>   | \$16,778,000         |
| Hoosick to North Bennington    | <ul style="list-style-type: none"> <li>Existing mainline needs upgrading over entire length;</li> <li>50-foot wide crossings;</li> <li>Every third tie is replaced, 50% of segment requires additional surfacing and aligning of curvature to meet increased speeds;</li> <li>All existing public grade crossings will require warning system modifications;</li> <li>One mile of new siding required for congestion relief;</li> <li>Two new turnouts for new siding;</li> <li>Culvert at 3143+00 needs to be extended past proposed siding; and</li> <li>Assume VTR will allow passenger service without new signal system.</li> </ul>  | \$5,302,000          |
| North Bennington to Manchester | <ul style="list-style-type: none"> <li>Existing mainline needs upgrading over entire length;</li> <li>50-foot wide crossings;</li> <li>All existing public grade crossings will require warning system modifications;</li> <li>Every third tie is replaced, 50% of segment requires additional surfacing and aligning of curvature to meet increased speeds;</li> <li>Bridge costs assumed for only bridges labeled in POOR condition; and</li> <li>Assume VTR will allow passenger service without new signal system.</li> </ul>   | \$17,208,000         |
| Manchester to Rutland          | <ul style="list-style-type: none"> <li>Existing mainline needs upgrading over entire length;</li> <li>50-foot wide crossings;</li> <li>All existing public grade crossings will require warning system modifications;</li> <li>Every third tie is replaced, 50% of segment requires additional surfacing and aligning of curvature to meet increased speeds;</li> <li>Bridge costs assumed for only bridges labeled in POOR condition;</li> <li>Siding at MP 36.15 is out of service – assume addition of 3,000-foot siding;</li> <li>Two turnouts needed for new siding;</li> <li>Siding entrance moved back 500 feet to avoid intersection at Brooklyn Road; and</li> <li>Assume VTR will allow passenger service without new signal system.</li> </ul> | \$44,510,000         |
| <b>TOTAL</b>                   |   | <b>\$106,954,000</b> |

**Table 5-2 – Station Cost Estimates**

| Station              |                    |
|----------------------|--------------------|
| Mechanicville, NY    | \$1,550,000        |
| North Bennington, VT | \$2,290,000        |
| Manchester, VT       | \$1,450,000        |
| <b>TOTAL</b>         | <b>\$5,290,000</b> |

The total capital cost including infrastructure improvements and station costs is approximately \$112 million. Total investment for the project is summarized in Table 5-3. A detailed estimate can be found in Appendix B Attachment B (Cost Estimate Tech Memo).

**Table 5-3 – Total Investment**

|                                 | Quantity | Unit | Unit Price     | Total                |
|---------------------------------|----------|------|----------------|----------------------|
| New Siding Track                | 54,868   | TF   | \$200.00       | \$10,973,600         |
| Upgrade Mainline Track          | 283,800  | TF   | \$52.66        | \$14,945,600         |
| Installation of CWR             | 36       | MI   | \$750,000.00   | \$27,225,000         |
| Shift Mainline Track            | 17,239   | TF   | \$150.00       | \$2,585,850          |
| Signal System                   | 4        | EA   | \$4,000,000.00 | \$16,000,000         |
| Grade Crossing - Public         | 3,600    | TF   | \$3,000.00     | \$10,800,000         |
| Grade Crossing - Private        | 130      | EA   | \$5,000.00     | \$650,000            |
| Grade Crossing - Warming System | 72       | EA   | \$150,000.00   | \$10,800,000         |
| Grade Crossing Signage - All    | 172      | EA   | \$5,000.00     | \$860,000            |
| Undergrade Bridges              | 9        | EA   | \$500,000.00   | \$4,500,000          |
| Turnouts                        | 25       | EA   | \$230,200.00   | \$5,755,000          |
| Turnout Removal                 | 4        | LS   | \$70,000.00    | \$280,000            |
| Clearing & Filling              | 1        | LS   | \$1,529,060.00 | \$1,529,060          |
| Culvert Extension               | 2        | EA   | \$25,000.00    | \$50,000             |
| Mechanicville Station           | 1        | LS   | \$1,550,000.00 | \$1,550,000          |
| No. Bennington Station          | 1        | LS   | \$2,290,000.00 | \$2,290,000          |
| Manchester Station              | 1        | LS   | \$1,450,000.00 | <u>\$1,450,000</u>   |
| <b>Construction Cost</b>        |          |      |                | <b>\$112,244,110</b> |
| Preliminary Engineering (10%)   |          |      |                | \$11,224,000         |
| Administration                  |          |      |                | \$300,000            |
| Construction Engineering (6%)   |          |      |                | <u>\$6,735,000</u>   |
| <b>Subtotal</b>                 |          |      |                | <b>\$130,503,000</b> |
| Contingency (6%)                |          |      |                | <u>\$7,830,000</u>   |
| <b>TOTAL</b>                    |          |      |                | <b>\$138,333,000</b> |



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# 6

## Operating Plan

Chapter 6 describes the operations plan for the proposed service based on the simulation analysis.

The Rail Traffic Controller TM (RTC) software model's Train Performance Calculator (TPC) was used to simulate one northbound and one southbound train between Albany and Rutland along the proposed route. The TPC runs are discussed in detail in the Summary of Simulation Assumptions and TPC Results technical memorandum, which can be found in Appendix C.

TPC runs were performed between Albany and Rutland in each direction. The train set used included one P42-DC locomotive pulling five coach cars.

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### 6.1 Proposed Operations

Alternative 1 proposes the operation of a new service from Albany/ Rensselaer to Rutland and back, serving the existing Schenectady and Rutland stations plus three new stations in Manchester, North Bennington and Mechanicville. It is assumed that layover in Rutland is possible at the location used by Ethan Allen trains. Because additional service is made possible through the extension of existing Empire Corridor service, no additional layover facilities are anticipated at the southern terminals.

For the operations analysis, service was evaluated as both a through service (no transfer needed for service beyond Albany/ Rensselaer, along the Empire Corridor) and a connecting service (trains terminate at

Albany/ Rensselaer, transfer required to Empire Corridor train).

Compared to the Existing Condition, Connecting Service requires the following:

- ▶ One new set of equipment (1 locomotive, two coaches, 1 cabbage unit, and a spare equipment allowance;
- ▶ One additional crew (1 Engineer, 1 Conductor, 1 Assistant Conductor) and an Extra Board allowance;
- ▶ 234/ 191 (Schenectady/ CP Colonie routing) additional train miles;
- ▶ Service at three new stations (Manchester, North Bennington, and Mechanicville); and
- ▶ One additional host railroad (PAR).

During the public review of the service alternatives, it was suggested that a through service would be preferred over a connecting service at Albany. Amtrak's experience in the intercity market indicates a shuttle connection reduces total demand from 25 – 40%, depending upon the type of service. To operate a through service, an existing Empire Corridor train that currently terminates in Albany would be extended to Rutland. In order to extend this train, an additional crew would be required. No additional equipment would be required.

Compared to the Existing Condition, Through Service requires the following:

- ▶ No additional equipment is required to operate the service as an existing Empire Corridor set is being utilized. It may be necessary to increase the spare equipment allowance;
- ▶ One additional crew (1 Engineer, 1 Conductor, 2 Assistant Conductors, 1 Lead Service Attendant) and an Extra Board allowance;
- ▶ 234/ 191 (Schenectady/ CP Colonie routing) additional train miles;
- ▶ Service at three new stations (Manchester, North Bennington, and Mechanicville); and
- ▶ One additional host railroad (PAR).

**Table 6-1 – Travel Times**

| Existing Amtrak Ethan Allen Express Service |      | Proposed Western Corridor Service |      |
|---|------|-----------------------------------|------|
| <b>Northbound</b>                           |      |                                   |      |
| Albany                                      | 0:00 | Albany                            | 0:00 |
| Schenectady                                 | 0:24 | Schenectady                       | 0:18 |
| Saratoga Springs                            | 0:52 | Mechanicville                     | 0:55 |
| Fort Edward-Glens Falls                     | 1:13 | North Bennington                  | 1:32 |
| Castleton                                   | 2:18 | Manchester                        | 1:58 |
| Rutland                                     | 3:05 | Rutland                           | 2:39 |
| <b>Southbound</b>                           |      |                                   |      |
| Rutland                                     | 0:00 | Rutland                           | 0:00 |
| Castleton                                   | 0:27 | Manchester                        | 0:42 |
| Fort Edward-Glens Falls                     | 1:43 | North Bennington                  | 1:09 |
| Saratoga Springs                            | 2:12 | Mechanicville                     | 1:46 |
| Schenectady                                 | 2:43 | Schenectady                       | 2:26 |
| Albany                                      | 3:05 | Albany                            | 2:49 |

The TPC results, shown in Table 6-1, reflect the effects of the physical geographic features and the positive influence of capital projects on the different corridor segments. In some segments, the northbound and southbound runtimes may be different due to long segments of increasing elevation, acceleration and deceleration rates, differences in Maximum Authorized Speed (MAS), or scheduled traffic on the line.

On the VRS segment, proposed upgrades to the railroad track infrastructure to attain a 60 mph MAS along the straight segments, result in run times over the line segment that are superior to the schedules when the line last saw passenger service in the early 1950s. At that time, scheduled train run times between Rutland and North Bennington were 82 minutes southbound and 73 minutes northbound.

## 6.2 Conceptual O&M Cost Estimate

O&M costs for each alternative were calculated based on the operating cost for the Ethan Allen service. The estimated cost for operating the

Ethan Allen service during Fiscal Year 2012<sup>6</sup> was used to project the cost for the Build Alternatives.

The 209 cost model is made up of two major cost categories: third party costs and route costs. Route costs consist of activities specific to running the route such as labor or route advertising. Third party costs are those costs paid to the host railroads so that the passenger service may operate over their right-of-way. Table 6-2 shows the estimated third party costs and route costs as well as revenue for FY 2012.

**Table 6-2 – Annual O&M Costs and Revenue**

|                   | No-Build    | Alt. 1       | Alt. 2      |
|-------------------|-------------|--------------|-------------|
| Annual O&M Cost   | \$6,297,000 | \$1,174,8000 | \$6,889,000 |
| Third Party Costs | \$868,000   | \$1,884,000  | \$1,016,000 |
| Route Costs       | \$5,429,000 | \$9,864,000  | \$5,873,000 |
| Annual Revenue    | \$2,950,000 | \$4,431,000  | \$3,714,000 |

Funding and cost-sharing opportunities were also evaluated for each alternative and are presented in Table 6-3. VTrans is the sponsoring agency for the Ethan Allen service and would be for the new service, but could negotiate with NYSDOT on splitting the state’s portion of the annual required subsidy based on train miles per state. For the existing Ethan Allen service extending from Albany north, the VTrans subsidy is based on the mileage from Fort Edwards – Glen Falls to Rutland, 44 miles, or approximately 44% of the 100-mile route. For the new route along the Western Corridor, the VTrans subsidy would cover from Mechanicville to Rutland, 81.4 miles, or approximately 70% of the 116.7-mile route. Since Alternative 2 primarily benefits Vermont, VTrans would subsidize 100% of the 116.7-mile route from Albany to Rutland. The NYSDOT subsidy includes credit that the state of New York receives on the Empire Corridor.

Annual fare revenue was calculated in the ridership model for the year 2030. The forecasted revenue was prepared using current (2012) fares for existing station-to-station trips (as accessed on the Amtrak website) and developing a similar fare structure for the proposed new stations based on distance between origin and destination. The total fare revenue for each alternative was based on the station-to-station fare multiplied by the projected number of riders traveling between those stations. The

<sup>6</sup> Based on the cost methodology developed as part of the coordination for cost-sharing related to Passenger Rail Investment Act of 2008 (PRIIA) Section 209.

O&M costs, total<sup>7</sup> revenue and cost per rider reported in Table B8 are for FY 2012. These 2012 figures were determined by calculating the annual growth in ridership for the Ethan Allen from 2010 (Base Year) to the No Build 2030 scenario, and then applying that growth rate to costs and revenues from FY 2010-11.

**Table 6-3 – Annual O&M Cost-Sharing**

|                 | No<br>Build | Alternative 1 | Alternative 2 |
|-----------------|-------------|---------------|---------------|
| VTrans Subsidy  | \$1,473,000 | \$4,235,000   | \$3,175,000   |
| NYS DOT Subsidy | \$1,874,000 | \$3,083,000   | \$0           |
| Total Subsidy   | \$3,347,000 | \$7,318,000   | \$3,175,000   |

While outside the scope of this study, the provision of intercity passenger rail service to Burlington can affect the operating cost factors proposed for this service. While ridership estimates are unavailable, the population base of the Burlington area is large and will likely result in considerable ridership added along the corridor. Depending on how the Burlington service is structured in terms of routing, it may result in less operating subsidies for the proposed service as ridership revenue will increase.

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<sup>7</sup> Total revenue includes fare revenue (the majority), food and beverage revenue, and other revenue (advertising, etc.).



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# 7

## Implementation Plan

This implementation plan helps stage the project into subsequent phases of development. It includes potential funding opportunities, follow-up actions, stakeholder agreements and potential phasing options in order to implement the project successfully and fully. The following sections describe these further.

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### 7.1 Funding

Essential to the delivery of an expanded passenger service is the development of a funding and financing strategy, which identifies sources and uses of funds for varying elements of the project. Funding for this project will likely have to come from multiple sources, as well. Reliance on multiple funding sources is an increasingly common pattern for major projects and is encouraged by US DOT. A menu of potential funding sources to be explored includes the following:

- High-Speed Intercity Passenger Rail Program Funds – On April 16, 2009, President Obama, together with Vice President Biden and U.S. Transportation Secretary Ray LaHood, announced a new vision for developing high-speed intercity passenger rail in America, calling for a collaborative effort by the federal government, states, railroads, and other key stakeholders to help transform America's transportation system through the creation of a national network of high-speed rail corridors. To achieve this vision, FRA published the High-Speed Rail Strategic Plan in April 2009 and launched the High Speed Intercity Passenger Rail (HSIPR) Program in June 2009. To realize President Obama's vision of giving 80% of Americans access to high-speed rail within the next 25 years, Congress made \$8 billion available through the American Recovery and Reinvestment Act of 2009 (ARRA). Congress continued to build upon the Recovery Act



by making available an additional \$2.1 billion through annual appropriations for FY 2009 and 2010, using the framework initially established by the Passenger Rail Investment and Improvement Act of 2008 (PRIIA), bringing the total program funding to \$10.1 billion.<sup>8</sup>

- **Transportation Investments Generating Economic Recovery (TIGER) Program Funds** --- The TIGER Discretionary Grant program provides a unique opportunity for the U.S. Department of Transportation to invest in road, rail, transit and port projects that promise to achieve critical national objectives. Congress dedicated more than \$4.1 billion to the program: \$1.5 billion for TIGER I, \$600 million for TIGER II, \$526.944 million for FY 2011, \$500 million for FY 2012, \$473.847 million for FY2013, and \$600 million for the FY 2014 round of TIGER Grants to fund projects that have a significant impact on the Nation, a region or a metropolitan area.<sup>9</sup>
- **Other Federal Sources** – While more properly described as financing than funding, the project could be structured to qualify for loans through TIFIA, RIF and or any national infrastructure bank that might be developed with re-authorization. Since these are loans (not grants), a revenue stream would be required.
- **State and Local Sources** --- New York and Vermont have traditionally used state bonds to fund infrastructure investments. While the debt burden attributed to transportation is significant and the state's bond capacity is finite, a bonding authorization for this project is a viable means of providing state level support for the project.

**Public/Private Partnerships** – The expanded passenger service could provide increased Transit Oriented Development opportunity around station sites. Working with private landowners and developers to build and run portions of the stations can help reduce the initial project cost and ongoing operation costs. Construction and operation of a parking lot is one example of a public private partnership applicable to this project.

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## 7.2 Stakeholder Agreements

New York and Vermont have a stakeholder agreement for operation of the Ethan Allen Service. This agreement will need to be modified to include the new route along the Western Corridor. VTrans is the sponsoring agency of the Ethan Allen service as well as the proposed

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<sup>8</sup> <http://www.fra.dot.gov/Page/P0060>

<sup>9</sup> <http://www.dot.gov/tiger>



new service, but the route will serve communities in both states. In addition, agreements will be needed with Amtrak, Pan Am Railway, CSX and VRS. An example of a service agreement is provided in Appendix D

Adjacent municipalities will also be affected by project implementation and any necessary agreements with those parties will be negotiated as necessary to meet program schedules and address specific items. No grade crossings will be affected, but land for stations will be needed in Mechanicville, North Bennington and Manchester. In addition, use of the historic North Bennington Station will need to be negotiated.

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## 7.3 Project Management

Prior to implementation, a Project Management Plan will be developed for the project to:

- Build upon a track record of success in completing railroad infrastructure projects;
- Use experienced in-house staff with consultant assistance;
- Create manageable contract packages (design/ build wherever possible);
- Utilize project management systems in place for technical, budget, and schedule monitoring and control;
- Include safety component and references for construction and operations of existing and planned corridor system; and
- Include a risk assessment and risk management plan to mitigate identified risks in implementation.

The project recognizes the size and complexity inherent in this undertaking. Existing management systems will need to be adapted to accommodate the coordination that will be necessary to design, build, and acquire all of the pieces necessary to complete the project.

A sample Project Management Plan can be found in Appendix E.

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## 7.4 Project Schedule

The project schedule would be based on the capital spending plan, project sequencing, and design and construction requirements. The project will be sequenced to minimize existing rail traffic interferences and delays while providing the most cost effective contracting approach

possible. The implementation schedule, shown in Table 7-1, would include final design, property acquisition, advertisement, contractor procurement, construction, and final inspection.

**Table 7-1 - Implementation Schedule**

|                      | Year 1 | Year 2 | Year 3 | Year 4 |
|----------------------|--------|--------|--------|--------|
| Final Design         | █      | █      |        |        |
| Property Acquisition |        | █      | █      |        |
| Advertisement        |        | █      | █      |        |
| Contractor Selection |        | █      | █      |        |
| Construction         |        |        | █      |        |
| Final Inspection     |        |        |        | █      |

## 7.5 Next Steps

At the conclusion of this phase of the planning process, there are several critical “Next Steps” to keep the project on-track. These steps, and a brief summary of what is required for each, include:

1. Development of Railroad Agreements: The new service would run on right of way owned by different freight railroads. Amtrak would operate the service but coordination is necessary with each of the freight railroads to develop operating agreements. Since passenger rail runs on a fixed schedule, Amtrak would need established operating windows to avoid service interruptions. In some areas, new freight sidings would allow for passing.
2. Finalize Preliminary Engineering and NEPA process: Refine the preliminary engineering plans and obtain sign-off from all stakeholders. Additionally, obtain Tier 2 (project-level) NEPA clearance.
3. Final Design: Following completion of the NEPA process and preliminary engineering, the project would advance into final engineering. This step would bring the design documents to completion, including the plans, specifications, estimate, and other construction-related documents.
4. Phasing: It may be possible to implement the project in phases by funding individual or smaller groups of projects with independent utility. This allows the project to advance if funding for all the capital improvements is not available at once. Additionally, service could be

implemented to some stations on an interim basis before the entire line is complete.

5. Funding: Identification of the funding sources and agreement between the State of Vermont and the State of New York over funding split is necessary to advance the project. For more detail on funding sources see Section 7.1.



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# 8

## Coordination with Other Initiatives

Transportation systems and economic development are closely tied together. It is essential, therefore, that transportation projects are closely coordinated with other State initiatives. As this project moves forward into future phases, the following past and on-going initiatives should be coordinated with this project.

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### 8.1 Albany-Bennington-Rutland- Burlington Project (2004)

The purpose of this study was to identify, evaluate and prioritize the various railroad infrastructure improvements necessary to upgrade the Albany-Bennington-Rutland-Burlington (ABRB) corridor to meet the present and future freight and passenger rail transportation needs for the State of Vermont. Findings and recommendations made from this study were:

- **ABRB 1 and 2 Programs (between Manchester and North Bennington, VT):** The preliminary work consisted of track, bridge and grade crossing rehabilitation and has been mostly completed.
- **ABRB S Program (between Hoosick Junction, NY and North Bennington, VT):** The work primarily consisted of track, bridge and grade crossing rehabilitation and was partially completed.
- **ABRB SC Program (between Hoosick Junction, NY and North Bennington, VT):** This program involved upgrading the ABRB corridor to FRA Class 3 operations from Hoosick Junction, NY to Burlington, VT in order to accommodate future freight and passenger rail service.

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## 8.2 Albany-Bennington-Rutland-Burlington Rail Passenger Service Study (1998)

The purpose of this study was to consider the feasibility of establishing passenger rail service along a route between Albany, NY and Burlington, VT with intermediate stations in North Bennington, Manchester, Rutland, and Middlebury, VT. The overall goal was to provide a capital improvement plan outlining costs, tasks, and timetables for achieving passenger rail service. Recommendations made from this study were:

- Conduct a track inspection of the entire alignment in both Vermont and New York;
- Conduct strategy sessions with key stakeholders to clarify and agree upon next steps to advance ABRB;
- Initiate the environmental investigation process;
- Continue to engage the Rail Council and Agency of Transportation into working with the freight and passenger railroads on matters such as access agreements, infrastructure planning, operations planning and capital improvement programming; and
- Develop a business plan, following further advancement of the ABRB concept.

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## 8.3 Western Corridor Transportation Management Plan (2000)

The purpose of this study was to examine transportation and area development conditions and proposed investment strategies for improving the transportation investments and efficiency of the Western Corridor of Vermont including Bennington, Rutland, Addison, Chittenden, and Franklin, VT. Recommendations made pertaining to the public transportation component of this EA were:

- Increase railroad ratings;
- Improve local circulation;
- Expand and improve public transportation service;
- Develop additional intermodal centers;
- Establish additional park-and-ride facilities;
- Expand travel demand management programs;

- Improve traveler information;
- Improve bicycle and pedestrian accommodations;
- Reduce border crossing delays for future passenger rail services; and
- Encourage compact, mixed-use development within towns.

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## **8.4 Vermont State Rail Plan (2014)**

The Vermont Agency of Transportation (VTrans) is updating its 2006 Vermont State Rail Plan and expects the plan to be completed by the end of 2014. The State Rail Plan will set forth goals, objectives and strategies for both passenger and freight rail. The plan will be coordinated within the context of state and federal planning requirements, with other state planning efforts and with collaborative input from the public and rail stakeholders.

The State Rail Plan would identify several goals:

- Support Vermont's economy
- Upgrade the system to stay connected and competitive
- Maintain safe and efficient operations
- Seek adequate and stable funding
- Balance needs of railroad with human and natural environments
- Preserve rail corridors for future transportation use



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# Appendices



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# A

## Identification and Evaluation of Alternatives – Phase One

This chapter describes the initial alternatives identified to address the Purpose and Need of the New York-Vermont Bi-State Intercity Passenger Rail Study and evaluates those alternatives. The first section in this chapter introduces the universe of potential service options and describes each alternative. The second section presents the anticipated capital improvements (and related costs) necessary to implement each alternative and screens each alternative against the evaluation criteria developed for the Phase One Screening. The final section presents the Build Alternatives that will move forward to the Phase Two analyses and screening.

The Phase One Screening of alternatives evaluates the ability of the alternatives to meet the broad objectives established for the project. The basic requirement for any alternative is that it satisfies the Purpose and Need statement for the project:

*The purpose of this project is to identify and establish an efficient intercity passenger rail-based transportation link that will benefit un-served and underserved communities in southwestern Vermont and eastern central New York. The project would provide intercity passenger rail connections between Rutland, Vermont and Albany, New York, with new intercity passenger rail services in southwestern Vermont and improvements to existing intercity passenger rail services in eastern central New York State. The project would also provide a key link along Vermont's "Western Corridor", with improved connections to passenger rail services in New York and beyond via Albany and/or Schenectady, New York.*

The project study area of southwestern Vermont and eastern central New York has limited transportation options. Communities within the study area have no direct access to the interstate highway system or a major airport, limited intercity passenger rail service, and limited intercity bus service. This condition has been, and continues to be, a hardship for residents and an impediment to economic development in the region.

The study area includes the major Amtrak station in Albany/Rensselaer, which in turn provides connections to other services in the northeast and beyond. Lack of intercity passenger rail, particularly in southwestern Vermont, limits the

options for those residents wanting to travel within the study area and within the greater region. With inevitable increases in the price (and possible subsequent decreases in the availability) of fuel for personal vehicles over the next 20 to 30 years, all areas of Vermont and eastern rural New York will need access to alternative transportation systems. Extending intercity passenger rail service within the project study area could be a first step towards meeting this goal.

The lack of rail not only hinders residents travel within the region, it is also an impediment to attracting travelers to the study area. This is a significant obstacle given the large role visitation continues to play in the regional economy. Through its proximity to the major Amtrak station in Albany/Rensselaer, the study area has access to frequent service to New York City. This geography provides an opportunity for intercity trips between communities within the study area and New York's Penn Station. Approximately four million residents in the New York City metropolitan area do not own a personal automobile and rely heavily on intercity passenger rail to travel the region. A rail connection to the study area could provide an extremely attractive option, based on both cost and travel time, for these potential travelers. Connecting the region to this type of buying power could stimulate significant economic development opportunities. However, the option is not currently available because there is no direct service link between Albany and southwestern Vermont.

Intercity passenger rail improvements are needed within the project study area as a result of:

- Insufficient access to intercity passenger rail services for those communities that are currently underserved or un-served;
- Insufficient intercity passenger and higher-speed rail service to meet market demands within and to/from the region;
- Limited ability of the existing freight infrastructure to accommodate passenger rail service at higher speeds and greater frequencies; and
- Lack of a transportation-focused catalyst for supporting economic development within the region.

The States of Vermont 2006 *State Rail and Policy Plan* identified new intercity passenger rail service along the Vermont Railway between Hoosick, NY and Burlington, VT as one of its priorities for intercity passenger rail. The mapped system in the *Vision for the New England High Speed and Intercity Rail Network* identifies existing service and potential services within the project study area, including the "Western Corridor" in Vermont and nearby New York communities. This region is an important geographical area and link to the overall rail system because it will provide direct intercity passenger rail connections to communities in southwestern Vermont, which will advance the goal of a continuous, integrated rail system in New England.

During Phase One, the alternatives developed to address the needs listed above are only defined conceptually; specific aspects such as schedule, specific infrastructure improvements and general station locations will be investigated during the Phase Two Screening. The intent of the Phase One evaluation is to determine those alternatives that meet or exceed the project evaluation criteria, and narrow the initial group of options to a set of Build Alternatives that will be carried forward to a more detailed level of analysis with the No-Build Alternative during the Phase Two Screening.

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## A.1 Description of Alternatives

Six alternatives have been developed to address mobility and transportation needs in the study area. These alternatives were established through a review of previous studies<sup>1</sup> and planning as well as a collaborative workshop. The initial alternatives were broadly defined to ensure that as many potentially feasible alternatives as possible were considered and evaluated. All six of the alternatives utilize existing, active rail lines within the study area. These rail lines are primarily used for the movement of freight as discussed in the Existing Conditions Summary (Section 4.3.2.6 of the Environmental Assessment). Two alternatives emerged from the Phase One Screening to continue into the Phase Two Screening and the next steps of project development.

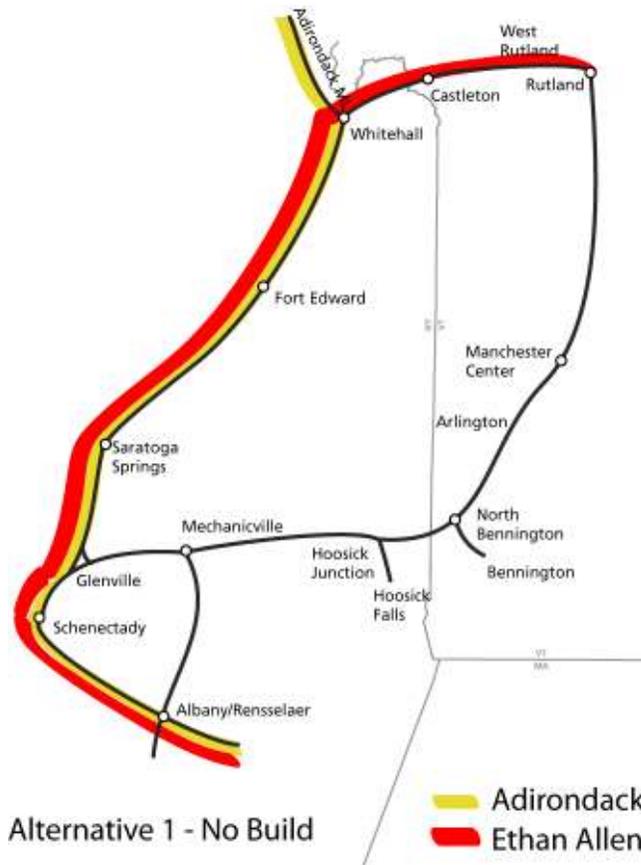
In considering the routing of a new passenger rail service from southwestern Vermont to Albany/Rensselaer, two options are apparent to make the connection between Mechanicville, New York and Albany/Rensselaer, New York. The first option is via the CP Colonie Line, which runs in a north-south orientation west of the Hudson River from Mechanicville, New York to Albany/Rensselaer, New York (CP Colonie Routing). The second option is via the CP Freight Subdivision between Mechanicville, New York and Schenectady, New York and the CSX Hudson Subdivision from Schenectady, New York to Albany/Rensselaer, New York (Schenectady Routing). Both of these routing options have been evaluated at a conceptual level of definition.

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<sup>1</sup> Albany/Bennington/Rutland/Burlington Rail Passenger Service Study, VAT, 1998; Vermont Western Corridor Study – Report to Congress, 2000; Comparative Analysis of Transp. Needs in 4 Areas of VT (VT Transp. Board), 2004; Albany/Bennington/Rutland/Burlington Project, VTrans, 2004; VT State Rail & Policy Plan, 2006; NY State Rail Plan, 2009; Vision for the New England HSR and Intercity Rail Network, 2009; NY-VT HISPR Track 3 Application, 2009; Ethan Allen HSIPR Track 2 Application, 2009; Vermont Western Corridor Management Plan – Report to Congress, 2010; Projected Improvements to the Vermont Railway Western Corridor, 2010

### A.1.1 Alternative 1: No-Build

Figure 1 Alternative 1 - No-Build



The No-Build Alternative consists of the existing transportation systems plus the currently planned and programmed track and service improvements in the project study area through the long-range planning horizon (year 2030). The National Environmental Policy Act (NEPA) requires inclusion in the evaluation of alternatives of a No-Build Alternative. It is evaluated to identify the operational and environmental effects on the study area if no action is taken. To meet this NEPA requirement, Alternative 1, the No-Build Alternative, will be advanced to the second phase of the screening process so it can be compared to the final alternatives. Figure 1 provides a schematic drawing of the No-Build Alternative

Existing passenger rail services in the study area included in the No-Build Alternative include:

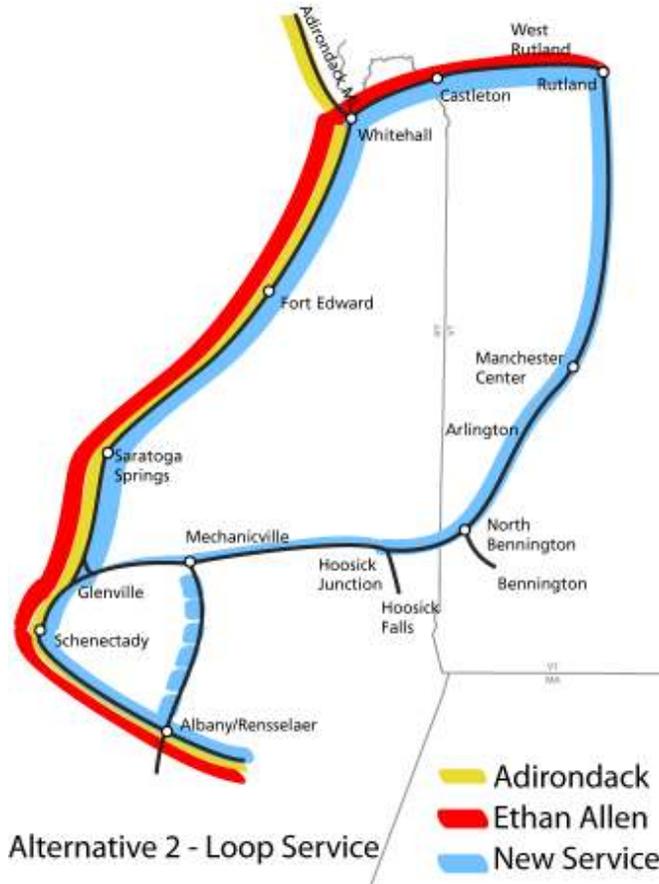
- The **Ethan Allen** service provides connections between Rutland, Vermont and New York City. It makes one round trip daily. Station stops within the project study area include Rutland, and Castleton, Vermont, and Fort Edward/Glens Falls, Saratoga Springs, Schenectady and Albany/Rensselaer, New York.
- The **Adirondack** service provides connections between Montreal and New York City. It makes one round trip daily. Station stops within the project study area include Whitehall, Fort Edward/Glens Falls, Saratoga Springs, Schenectady and Albany/Rensselaer, New York.

The No-Build Alternative includes programmed and funded improvements to the existing rail infrastructure in the study area. These improvements are:

- Addition of a fourth track at Albany/Rensselaer station (\$58.1M)
- Addition of a second mainline track between Albany/Rensselaer and Schenectady (\$91.2M)
- Two miles of new track at Ballston Spa to provide a five (5) mile segment of double-track extending from Saratoga Springs to Ballston Spa, New York (\$6.6M).

A.1.2 Alternative 2: Loop Service

Figure 2 Alternative 2 - Loop Service



Alternative 2 would provide “loop” service connecting stations in Albany/Rensselaer, Mechanicville, Schenectady, Saratoga Springs, and Fort Edward/Glens Falls, New York; and Castleton, Rutland, Manchester, and North Bennington, Vermont. Figure 2 is a schematic map of the Loop Service Alternative.

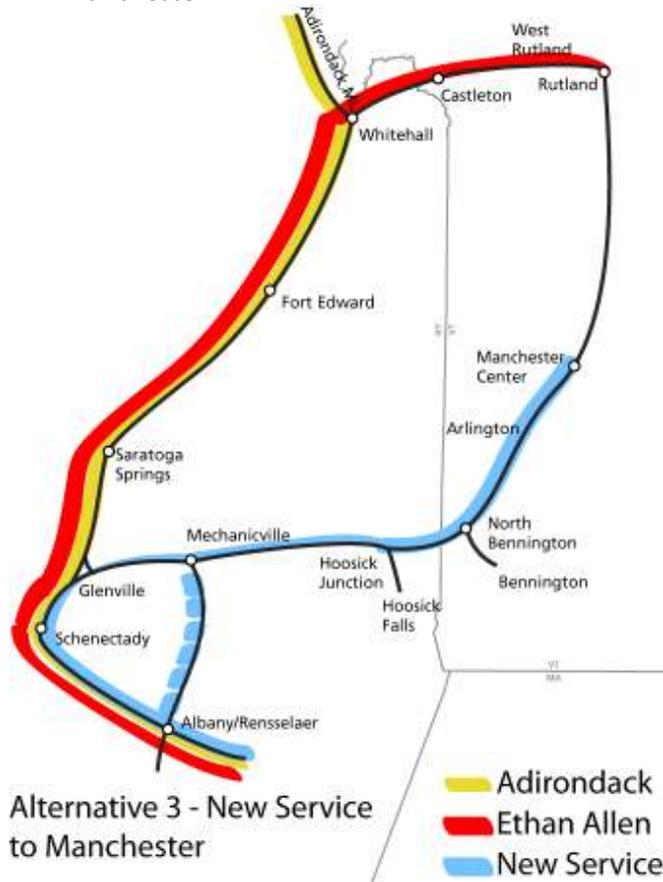
Alternative 2 would require one additional trainset to provide connecting service out of the Albany/Rensselaer, New York station. The additional trainset would operate in one direction (clockwise or counterclockwise) providing one new round trip per day.

In Alternative 2 the existing Ethan Allen and Adirondack services would continue to operate on the same routes and frequencies (one round trip per day for both) as they do now.

This alternative would introduce service to Mechanicville, New York, and to North Bennington and Manchester, Vermont.

### A.1.3 Alternative 3: New Service to Manchester

**Figure 3 Alternative 3 - New Service to Manchester**



Alternative 3 would provide new service to southwest Vermont, with a terminus in Manchester. Figure 3 is a schematic map of the New Service to Manchester Alternative.

This alternative would extend service from the Albany/Rensselaer, New York station to new stations in Mechanicville, New York and North Bennington, Vermont and Manchester, Vermont. Alternative 3 would provide one round trip per day.

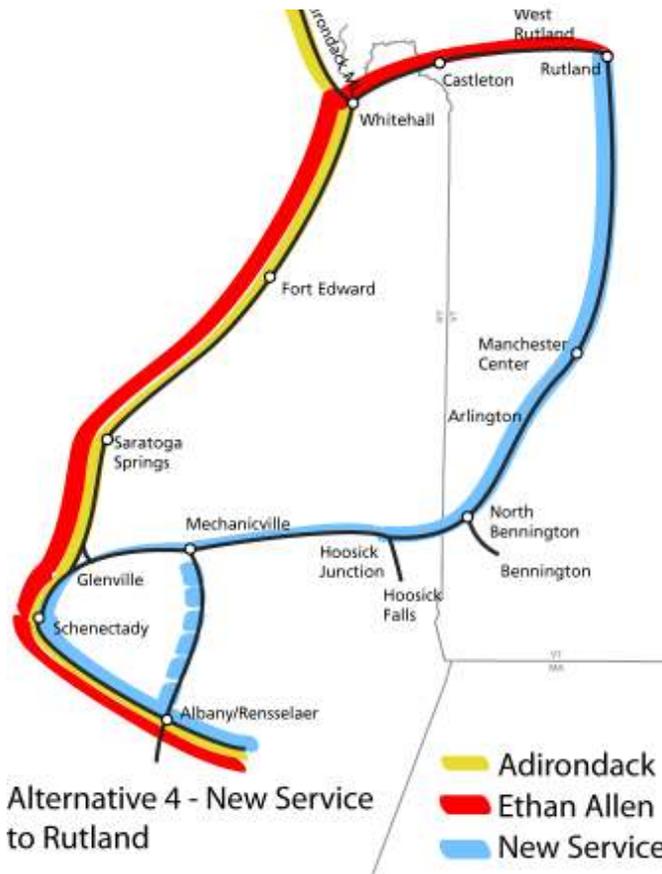
During the public review of the proposed service alternatives, it was suggested that a through service (no transfer at Albany/Rensselaer, New York, for continued service southbound along the Empire Corridor) would be preferred over a connecting service at Albany/Rensselaer (if trains terminate at this station, a transfer is required). For Alternative 3 to operate as a through service, an existing Empire Corridor train that currently terminates in Albany/Rensselaer, New York would be extended to Manchester, Vermont.

Attachment 2 describes how a through service versus connecting service would operate.

In Alternative 3 the existing Ethan Allen and Adirondack services would continue to operate on the same routes and frequencies (one round trip per day for both) as they do now. It would provide new service to Mechanicville, New York and North Bennington and Manchester Center, Vermont but would not connect between Manchester Center and Rutland, Vermont.

**A.1.4 Alternative 4: New Service to Rutland**

**Figure 4 Alternative 4 - New Service to Rutland**



Alternative 4 would extend service to southwest Vermont, with a terminus in Rutland, Vermont. Figure 4 is a schematic map of the New Service to Rutland Alternative.

This alternative would operate out of Albany/Rensselaer, New York station connecting to new stations in Mechanicville, New York and North Bennington and Manchester, Vermont, en route to a terminus in Rutland, Vermont. Alternative 4 would operate one round trip per day.

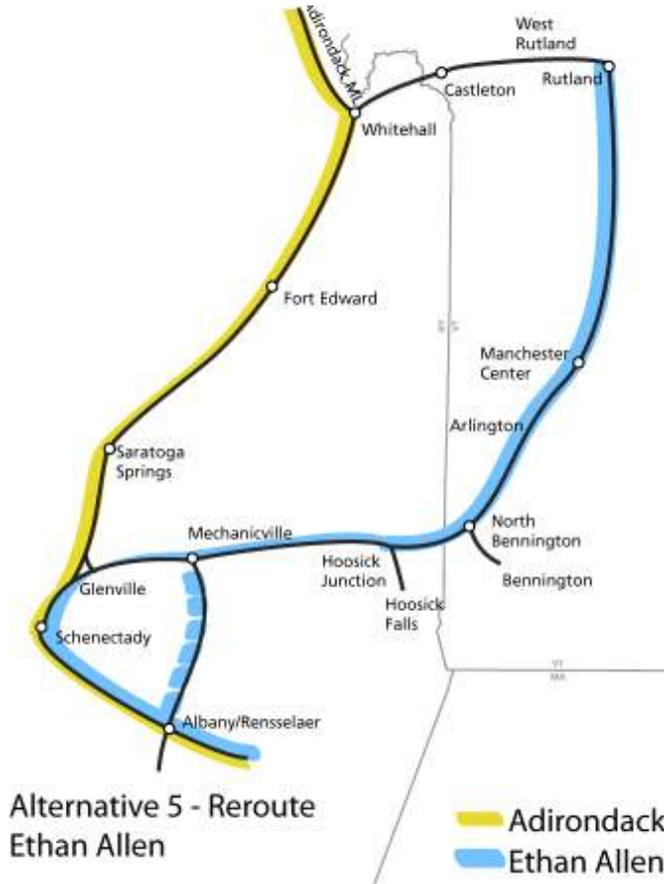
Similar to Alternative 3, a preference for through service (no transfer needed for service beyond Albany/Rensselaer, New York, along the Empire Corridor) over a connecting service at Albany/Rensselaer (trains terminate at this station, transfer required) by the public. To operate Alternative 4 as a through service, an existing Empire

Corridor train that currently terminates at Albany/Rensselaer, New York would be extended to Rutland, Vermont. Attachment 2 describes the through versus connecting service operations.

In Alternative 4 the Ethan Allen and Adirondack services would continue to operate on the same routes and frequencies (one round trip per day for both) as they do now. Alternative 4 would provide new service to Mechanicville, New York and North Bennington and Manchester, Vermont.

**A.1.5 Alternative 5: Rerouted Ethan Allen Service**

**Figure 5 Alternative 5 - Reroute Ethan Allen**



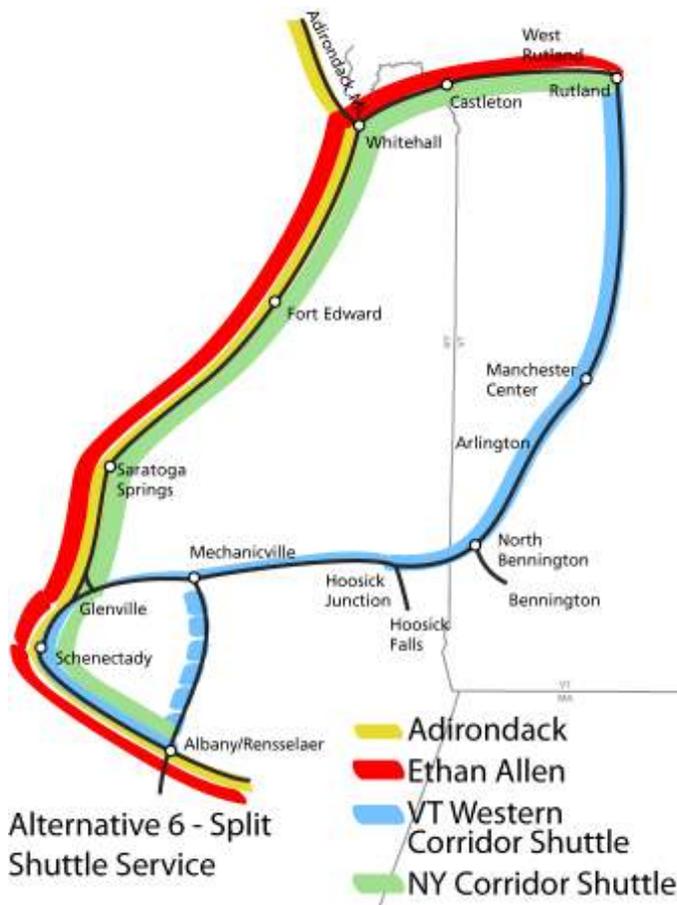
Alternative 5 would re-route the existing Ethan Allen service through southwest Vermont. The alternative would operate between Rutland, VERMONT and Albany/Rensselaer, New York through southwest Vermont with stops in Mechanicville, New York and North Bennington and Manchester, Vermont. Figure 5 is a schematic map of the Rerouted Ethan Allen Service Alternative.

In Alternative 5 the existing Adirondack service would continue to operate on the same route and at the same frequency (one round trip per day) as it does now. The Ethan Allen service would operate one round trip per day.

With this alternative service to Castleton would be eliminated while service to Mechanicville, New York and North Bennington and Manchester, Vermont would be added.

**A.1.6 Alternative 6: Split Shuttle Service**

**Figure 6 Alternative 6 - Split Shuttle Service**



Alternative 6 would be a “shuttle” service connecting Albany/Rensselaer, New York and Rutland, Vermont via two routes. The termini for both services would be Albany/Rensselaer, New York on the south end and Rutland, Vermont on the north end. One would stop in Mechanicville, New York and North Bennington and Manchester, Vermont. The other would follow the same route as the existing Ethan Allen service, stopping at Castleton, Vermont and Fort Edward/Glens Falls, Saratoga Springs and Schenectady, New York. Each service would operate on one side of the loop and provide round-trip service (“out and back”) – for a total of two trains per day on each side of the loop. Figure 6 is a schematic map of the Split Service Shuttle Alternative.

In Alternative 6 the existing Ethan Allen and Adirondack services would continue to operate on the same frequencies (one round trip per day for each) as they do now. This alternative would provide new service to Mechanicville, New York and North Bennington and Manchester Center, Vermont.

**A.1.7 Summary of Alternatives**

Table A1 summarizes how each alternative would change the intercity passenger rail service in the project study area.

**New York – Vermont Bi-State  
Intercity Passenger Rail Study**



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Table A1 - Operational Summary of the Alternatives

| Alternative                      | Ethan Allen Service   | Adirondack Service | Changes to Service along Eastern New York Corridor | Changes to Service along Southwest Vermont Corridor                | New Stations   | Potential Timetable for New/Rerouted Service   |  |  |  |
|----------------------------------|-----------------------|--------------------|--|--|--|--|--|--|--|
|                                  |                       |                    |  |  |  | Southbound (Read Down)   |  | Northbound (Read Up)   |  |
| 1 – No-Build                     | Remains               | Remains            | No Change  | No Change  | None   | N/A  |  | N/A  |  |
| 2 – Loop Service                 | Remains               | Remains            | One additional train                               | New service (one new train – one way trip); terminates in Rutland  | Mechanicville, NY<br>North Bennington & Manchester, VT | Rutland<br>Manchester<br>North Bennington<br>Mechanicville<br>Schenectady<br>Albany/Rensselaer   | 9:00AM<br>9:30<br>10:15<br>10:45<br>11:15<br>11:35AM   | Rutland<br>Castleton<br>Ft. Edward<br>Saratoga Springs<br>Schenectady<br>Albany/Rensselaer   | 2:15PM<br>2:00<br>1:10<br>12:40<br>12:10PM<br>11:50AM  |
| 3 – New Service to Manchester    | Remains               | Remains            | No Change  | New service (one RT <sup>1</sup> train); terminates in Manchester. | Mechanicville, NY<br>North Bennington & Manchester, VT | Manchester<br>North Bennington<br>Mechanicville<br>Schenectady<br>Albany/Rensselaer  | 9:45AM<br>10:15<br>11:00<br>11:28<br>11:45AM   | Manchester<br>North Bennington<br>Mechanicville<br>Schenectady<br>Albany/Rensselaer  | 4:45PM<br>4:15<br>3:30<br>3:00<br>2:40PM   |
| 4 – New Service to Rutland       | Remains               | Remains            | No Change  | New service (one RT train); terminates in Rutland.                 | Mechanicville, NY<br>North Bennington & Manchester, VT | Rutland<br>Manchester<br>North Bennington<br>Mechanicville<br>Schenectady<br>Albany/Rensselaer   | 9:00AM<br>9:45<br>10:15<br>11:00<br>11:28<br>11:45AM   | Rutland<br>Manchester<br>North Bennington<br>Mechanicville<br>Schenectady<br>Albany/Rensselaer   | 5:30PM<br>4:45<br>4:15<br>3:30<br>3:00<br>2:40PM   |
| 5 – Rerouted Ethan Allen Service | Shifts to VT corridor | Remains            | Loss of one train                                  | New service (one RT train); terminates in Rutland.                 | Mechanicville, NY<br>North Bennington & Manchester, VT | Same as Alternative 4  |  |  |  |
| 6 – Split Shuttle Service        | Remains               | Remains            | One additional RT                                  | New service (one RT train); terminates in Rutland.                 | Mechanicville, NY<br>North Bennington & Manchester, VT | <u>VT Shuttle</u><br>Rutland<br>Manchester<br>North Bennington<br>Mechanicville<br>Schenectady<br>Albany/Rensselaer<br><u>NY Shuttle</u><br>Rutland<br>Castleton<br>Ft. Edward<br>Saratoga Springs<br>Schenectady<br>Albany/Rensselaer | 7:00AM<br>7:30<br>8:00<br>8:45<br>9:15<br>9:35AM<br>12:00PM<br>12:15<br>1:05<br>1:35<br>2:05<br>2:30PM | <u>VT Shuttle</u><br>Rutland<br>Manchester<br>North Bennington<br>Mechanicville<br>Schenectady<br>Albany/Rensselaer<br><u>NY Shuttle</u><br>Rutland<br>Castleton<br>Ft. Edward<br>Saratoga Springs<br>Schenectady<br>Albany/Rensselaer | 12:50PM<br>12:05PM<br>11:35<br>10:50<br>10:20<br>10:00AM<br>5:30<br>5:10<br>4:20<br>3:50<br>3:20<br>3:00PM |

1 RT = Round Trip



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## A.2 Evaluation of Alternatives

The goal of the Phase One Screening is to objectively identify and evaluate the universe of alternatives and identify those that best satisfy the project purpose and need. During the Phase One Screening, the alternatives are evaluated in a conceptual manner. The Phase One Screening process includes a determination of the basic realistic feasibility of each alternative. The Project Purpose and Need statement is the basis for the evaluation criteria, which have been grouped into four categories:

- Rail Access and Mobility
- Transportation Efficiencies
- Economic/Sustainable Development
- Environmental Quality

Section A.3 summarizes the performance of each alternative for these evaluation categories. Each alternative was evaluated based on best available information. Order of magnitude capital cost, operations and maintenance (O&M) cost estimates and ridership forecasts were developed to support the evaluation.

An initial assessment of the six alternatives was conducted and distributed for review. Based on comments received on the initial assessment, additional analyses were conducted to further test and refine the alternatives.

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### A.2.1 Rail Access and Mobility

The criteria used to measure which proposed service options improve intercity passenger rail access and regional mobility include:

- Improved regional mobility and access to key destinations within the project study area;
- Travel time savings as compared to existing travel modes (rail, car, bus); and
- Sufficiency of the frequency of service and routing to make the alternative an attractive transportation option.

At this level of analysis, the performance of each alternative is based on the proposed routing. A brief summary of the performance of each alternative for the three Rail Access and Mobility criteria is provided below. The ridership forecasts developed to complete the Phase One Screening are presented and discussed in Section A.3.

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## Rail Access and Mobility – Performance Summary

### Alternative 1 – No-Build

Since no service improvements would be made under this alternative, other than planned and programmed track and service improvements, the existing deficiencies in coverage within the study area would remain unchanged – specifically in southwestern Vermont.

### Alternative 2 – Loop Service

This alternative would extend intercity passenger rail service into southwest Vermont, increasing access to passenger rail service. The proposed single direction loop routing, with connecting (rather than through) service at Albany/Rensselaer, and a single round trip per day would make the round trip inefficient and travel time savings less likely.

Due to the proposed routing, this alternative is anticipated to be a less attractive option than the other alternatives because in the out-bound or in-bound direction for those boarding in Manchester or North Bennington it would require users to travel through Rutland.

### Alternative 3 – New Service to Manchester

This alternative would extend intercity passenger rail service into southwest Vermont, improving the rail access from that region to Albany/Rensselaer and other Northeast destinations (via Empire Corridor connections). Potential travel time savings are anticipated due to new connections in southwest Vermont.

This routing is anticipated to be attractive for travelers between Manchester or North Bennington and Albany/Rensselaer; however it is anticipated that the lack of a connection to Rutland would limit the attractiveness of the service.

### Alternative 4 – New Service to Rutland

This alternative would extend intercity passenger rail service into southwest Vermont, improving rail access from that region to Albany/Rensselaer and the Northeast (via Empire Corridor connections). Potential travel time savings are anticipated with this alternative due to new connections in southwest Vermont.

### Alternative 5 – Rerouted Ethan Allen Service

This alternative would extend intercity passenger rail service into southwest Vermont, improving rail access from that region to Albany/Rensselaer and the Northeast (via Empire Corridor connections); however it would reduce service to/from the New York portion of the project study area. While there may be

potential time savings for travelers to/from southwest Vermont, there may also be an increase in travel times to/from destinations in New York due to the reduction in service in that portion of the study area.

This alternative is anticipated to be attractive for travelers to/from southwest Vermont, but unattractive for travelers on the New York side of the study area.

### **Alternative 6 – Split Shuttle Service**

This alternative would extend intercity passenger rail service into southwest Vermont and add additional service on the New York side of the study area, improving mobility and access to intercity passenger rail throughout the corridor. Potential travel time savings are anticipated due to new connections in southwest Vermont, and the additional frequency on the New York side of the study area.

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## **A.2.2 Transportation Efficiencies**

The factors used to evaluate how well proposed alternatives maximize transportation efficiencies include:

- Ability to provide viable and useful intermodal connections;
- Cost efficiency (based on order of magnitude cost estimates);
- Ability to maximize the existing infrastructure;
- Ability to minimize impacts to existing freight and passenger rail operations post implementation; and
- Ability to minimize impact to existing freight and passenger rail operations during construction.

To support the evaluation of the proposed alternatives against the listed criteria a summary of the intermodal connections by alternative was prepared, and order of magnitude capital costs (for both rail infrastructure and facilities) and preliminary operations and maintenance (O&M) costs were estimated. A brief summary of the performance of each alternative for each of the Transportation Efficiency criteria is provided following the capital cost and operations summaries.

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### **Intermodal Connections**

Table A2 provides a summary of the intermodal connections available at each station (or within ½-mile of the station), by alternative. New stations were not cited as part of the Phase One evaluations; in these cases, intermodal connections available within the towns are listed.

**Table A2 - Intermodal Connections at Study Area Stations, by Alternative**

| Stations                    | Available Intermodal Connections, by Alternative   |  |  |  |   |  |
|-----------------------------|--|--|--|--|---|--|
|                             | ALT 1  | ALT 2  | ALT 3  | ALT 4  | ALT 5   | ALT 6  |
| Rutland                     | <u>Passenger Train</u> – Ethan Allen<br><u>Local Bus</u> - MVRT  | <u>Passenger Train</u> – Ethan Allen, <b>New Service</b><br><u>Local Bus</u> - MVRT  | <u>Passenger Train</u> – Ethan Allen<br><u>Local Bus</u> - MVRT  | <u>Passenger Train</u> – Ethan Allen, <b>New Service</b><br><u>Local Bus</u> - MVRT  | <u>Passenger Train</u> – Ethan Allen (rerouted)<br><u>Local Bus</u> - MVRT  | <u>Passenger Train</u> – Ethan Allen, <b>New Service</b><br><u>Local Bus</u> - MVRT  |
| Castleton                   | <u>Passenger Train</u> – Ethan Allen<br><u>Local Bus</u> - MVRT  | <u>Passenger Train</u> – Ethan Allen, <b>New Service</b><br><u>Local Bus</u> - MVRT  | <u>Passenger Train</u> – Ethan Allen<br><u>Local Bus</u> - MVRT  | <u>Passenger Train</u> – Ethan Allen<br><u>Local Bus</u> - MVRT  | <u>Local Bus</u> - MVRT   | <u>Passenger Train</u> – Ethan Allen, <b>New Service</b><br><u>Local Bus</u> - MVRT  |
| Whitehall                   | <u>Passenger Train</u> – Adirondack  | <u>Passenger Train</u> – Adirondack  | <u>Passenger Train</u> – Adirondack  | <u>Passenger Train</u> – Adirondack  | <u>Passenger Train</u> – Adirondack   | <u>Passenger Train</u> – Adirondack  |
| Fort Edward/<br>Glens Falls | <u>Passenger Train</u> – Ethan Allen, Adirondack<br><u>Local Bus</u> - GGFT  | <u>Passenger Train</u> – Adirondack, Ethan Allen, <b>New Svc</b><br><u>Local Bus</u> - GGFT  | <u>Passenger Train</u> – Ethan Allen, Adirondack<br><u>Local Bus</u> - GGFT  | <u>Passenger Train</u> – Ethan Allen, Adirondack<br><u>Local Bus</u> - GGFT  | <u>Passenger Train</u> – Adirondack<br><u>Local Bus</u> - GGFT  | <u>Passenger Train</u> – Adirondack, Ethan Allen, <b>New Svc</b><br><u>Local Bus</u> - GGFT  |
| Saratoga Springs            | <u>Passenger Train</u> – Ethan Allen, Adirondack<br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, Greyhound                     | <u>Passenger Train</u> – Ethan Allen, Adirondack, <b>New Service</b><br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, Greyhound                     | <u>Passenger Train</u> – Ethan Allen, Adirondack<br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, Greyhound   | <u>Passenger Train</u> – Ethan Allen, Adirondack<br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, Greyhound   | <u>Passenger Train</u> – Adirondack<br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, Greyhound   | <u>Passenger Train</u> – Ethan Allen, Adirondack, <b>New Service</b><br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, Greyhound                     |
| Schenectady                 | <u>Passenger Train</u> – Ethan Allen, Adirondack, Empire Service<br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, Greyhound     | <u>Passenger Train</u> – Ethan Allen, Adirondack, <b>New Service</b><br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, Greyhound                     | <u>Passenger Train</u> – Ethan Allen, Adirondack, Empire Service<br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, Greyhound                         | <u>Passenger Train</u> – Ethan Allen, Adirondack, Empire Service, <b>New Service</b><br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, Greyhound     | <u>Passenger Train</u> – Ethan Allen (rerouted), Empire Service, Adirondack<br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, Greyhound     | <u>Passenger Train</u> – Ethan Allen, Adirondack, Empire Service, <b>New Service</b><br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, Greyhound     |
| Albany/<br>Rensselaer       | <u>Passenger Train</u> – Ethan Allen, Adirondack, Empire Service<br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, YT, Greyhound | <u>Passenger Train</u> – Ethan Allen, Adirondack, Empire Service, <b>New Service</b><br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, YT, Greyhound | <u>Passenger Train</u> – Ethan Allen, Adirondack, Empire Service, <b>New Service</b><br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, YT, Greyhound | <u>Passenger Train</u> – Ethan Allen, Adirondack, Empire Service, <b>New Service</b><br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, YT, Greyhound | <u>Passenger Train</u> – Ethan Allen (rerouted), Empire Service, Adirondack<br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, YT, Greyhound | <u>Passenger Train</u> – Ethan Allen, Adirondack, Empire Service, <b>New Service</b><br><u>Local Bus</u> - CDTA<br><u>Regional Bus</u> – AT, YT, Greyhound |
| Mechanicville               | <u>Local Bus</u> – Mech. City Bus  | <u>Passenger Train</u> – <b>New Service</b><br><u>Local Bus</u> – Mech. City Bus   | <u>Passenger Train</u> – <b>New Service</b><br><u>Local Bus</u> – Mech. City Bus   | <u>Passenger Train</u> – <b>New Service</b><br><u>Local Bus</u> – Mech. City Bus   | <u>Passenger Train</u> – <b>New Service</b><br><u>Local Bus</u> – Mech. City Bus  | <u>Passenger Train</u> – <b>New Service</b><br><u>Local Bus</u> – Mech. City Bus   |
| North Bennington            | <u>Local Bus</u> – GMCN  | <u>Passenger Train</u> – <b>New Service</b><br><u>Local Bus</u> – GMCN   | <u>Passenger Train</u> – <b>New Service</b><br><u>Local Bus</u> – GMCN   | <u>Passenger Train</u> – <b>New Service</b><br><u>Local Bus</u> – GMCN   | <u>Passenger Train</u> – <b>New Service</b><br><u>Local Bus</u> – GMCN  | <u>Passenger Train</u> – <b>New Service</b><br><u>Local Bus</u> – GMCN   |
| Manchester                  | <u>Local Bus</u> – MVRT, GMCN  | <u>Passenger Train</u> – <b>New Service</b><br><u>Local Bus</u> – MVRT, GMCN   | <u>Passenger Train</u> – <b>New Service</b><br><u>Local Bus</u> – MVRT, GMCN   | <u>Passenger Train</u> – <b>New Service</b><br><u>Local Bus</u> – MVRT, GMCN   | <u>Passenger Train</u> – <b>New Service</b><br><u>Local Bus</u> – MVRT, GMCN  | <u>Passenger Train</u> – <b>New Service</b><br><u>Local Bus</u> – MVRT, GMCN   |

CDTA = Capital District Transit Authority      MVRT = Marble Valley Regional Transit      YT = Yankee Trails

GGFT = Greater Glens Falls Transit      GMCN = Green Mountain Community Network      AT = Adirondack Trailways

## Capital Cost Estimates

The rail corridors within the project study area being considered to accommodate the proposed alternatives include:

- Vermont Railway's (VTR) B&R Subdivision that extends between Rutland and Bennington, Vermont and from North Bennington, Vermont to Hoosick Junction, New York; and the Clarendon and Pittsford (CLP) Main Line between Whitehall, New York and Rutland, Vermont;
- Pan Am Railway's (PAR) Freight Main Line between Hoosick Junction and Mechanicville, New York;
- Canadian Pacific Rail's (CPR) Colonie Subdivision between Albany/Rensselaer and Mechanicville, New York; the Freight Subdivision between Mechanicville and Schenectady, New York; and the Canadian Subdivision between Glenville and Whitehall, New York; and
- CSX's Hudson Subdivision between Albany/Rensselaer and Schenectady, New York.

Figure 7 Study Segments



For the purposes of the Phase One Screening, the existing rail corridors in the project study area were divided into 10 segments (Figure 7). Each segment was reviewed to determine the capital improvements necessary to accommodate one additional train per day to correspond with the assumptions of the alternatives. The proposed capital improvements are intended to bring all tracks in the study area up to FRA Class 3 standards at a minimum – such that an operating speed of up to 59 mph is feasible, where geometry and operating rules allow.

The alternatives identify ten station locations that could be included in future passenger rail service in the project study area:

- Rutland
- Manchester
- North Bennington
- Mechanicville
- Albany/Rensselaer
- Schenectady
- Ft Edwards/Glens Falls
- Saratoga Springs
- Whitehall
- Castleton

Seven of these ten locations have existing stations. Three new stations are included, one each in Manchester and North Bennington, Vermont, and Mechanicville, New York.

Table A3 summarizes the anticipated order of magnitude capital cost estimates (2011 dollars) and the relative cost impact, by alternative. The capital costs of both routings to connect Mechanicville, New York to Albany/ Rensselaer, New York are provided in Table A3 as well. Attachment 1 includes a more detailed description of the capital improvements associated with each alternative for both rail infrastructure and facilities and catalogs the order of magnitude capital cost estimate by alternative.

**Table A3 – Capital Cost Summary (2011 Dollars)<sup>1</sup>**

| Alternative  | Total Cost –<br>CP Colonie<br>Routing | Total Cost –<br>Schenectady<br>Routing | Relative<br>Cost Impact <sup>3</sup> |
|--|---------------------------------------|--|--------------------------------------|
| 1 – No-Build   | \$0                                   | \$0                                    | None                                 |
| 2 – Loop Service <sup>2</sup>                              | \$210.4                               | \$154.7                                | High                                 |
| 3 – New Service to Manchester<br>(Through)                 | \$135.0                               | \$89.7                                 | Low                                  |
| 3 – New Service to Manchester<br>(Connecting) <sup>2</sup> | \$151.5                               | \$106.2                                | Moderate                             |
| 4 – New Service to Rutland<br>(Through)                    | \$160.1                               | \$114.8                                | Moderate                             |
| 4 – New Service to Rutland<br>(Connecting) <sup>2</sup>    | \$178.7                               | \$133.4                                | High                                 |
| 5 – Rerouted Ethan Allen Service                           | \$160.1                               | \$114.8                                | Moderate                             |
| 6 – Split Shuttle Service <sup>2</sup>                     | \$210.4                               | \$154.7                                | High                                 |

1 Millions of dollars.

2 Includes equipment costs. The consist for services that will connect in Albany/Rensselaer is assumed to include: 1 diesel locomotive, two single-level trains, one cabbage unit.

3 Low: \$0 to \$99 million, Moderate: \$100 million to \$125 million, High: over \$125 million

## Operations and Maintenance Cost Estimates

Operating and maintenance costs are typically comprised of four major components: transportation, mechanical, engineering and administration. Attachment 2 describes the assumptions made regarding the operational needs to implement the proposed options and summarizes the needs of each alternative relative to the others.

Order of magnitude operations and maintenance (O&M) costs were prepared for each Alternative to provide a relative comparison of their anticipated recurring costs. Section 209 of the Passenger Rail Investment Act of 2008 (PRIIA) mandates that states pay their fair share of all short-distance Amtrak corridor services. It is anticipated that for most states this will translate to an increase in the amount they will be cover (as compared to what is currently paid). PRIIA Section 209 requires that the new cost sharing structure be in place and implemented by October 2013; therefore, any new or modified intercity passenger rail service will be subject to the requirements of this legislation. Given limited state funds, O&M costs are a major factor in deciding the feasibility of a proposed service.

For the purposes of the Phase One Screening, the O&M costs for each alternative were calculated based on the existing operating cost for the Ethan Allen service. The fully-allocated cost for operating the Ethan Allen service during Fiscal Year 2011 (9/2010-9/2011) was used to estimate an average per-mile operating cost. This per-mile cost was applied to the proposed service alternatives to calculate estimated net O&M costs based on the additional train miles for each alternative. Table A4 shows the estimated net O&M cost for both routings to connect Mechanicville, New York to Albany/Rensselaer, New York and the relative cost impact, by alternative.

**Table A4 – O&M Cost Summary (2011 Dollars)<sup>1</sup>**

| Alternative                      | CP Colonie Routing | Schenectady Routing | Relative Cost Impact <sup>2</sup> |
|----------------------------------|--------------------|---------------------|-----------------------------------|
| 1 – No-Build                     | \$0                | \$0                 | None                              |
| 2 – Loop Service                 | \$4.7              | \$5.2               | Moderate                          |
| 3 – New Service to Manchester    | \$3.1              | \$4.1               | Moderate                          |
| 4 – New Service to Rutland       | \$4.6              | \$5.6               | Moderate                          |
| 5 – Rerouted Ethan Allen Service | (\$0.2)            | \$0.8               | Low                               |
| 6 – Split Shuttle Service        | \$9.4              | \$10.5              | High                              |

1 Millions of dollars.

2 Low: 0 to \$2.5 million; Moderate: \$2.5 million to \$7.5 million, High: Over \$7.5 million.

Major points include:

- The sponsoring states will be responsible for paying their “fair share” of the new service in addition to their shares for existing short-distance corridor services. This means that the costs shown in Table 4 would be in addition other existing services (e.g. the Ethan Allen service for the State of Vermont and the Adirondack service for the State of New York).
- The estimated O&M costs for Alternative 5 – the Rerouted Ethan Allen Service – are significantly lower than the other alternatives. This is because the O&M cost estimates are calculated based on additional mileage (over the No-Build) and rerouting the Ethan Allen service through southwest Vermont results in a net gain of only 34 mile using the Schenectady routing, and a net loss of 9 miles using the CP Colonie routing.

Attachment 2 includes more detailed tables related to the O&M cost estimate calculations.

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## Transportation Efficiency – Performance Summary

### Alternative 1 – No-Build

Alternative 1 proposes no capital improvements beyond those already committed, thus there are no anticipated impacts to existing passenger or freight rail operations. This alternative would not provide any additional intermodal connections since currently unserved areas would remain unserved.

### Alternative 2 – Loop Service

Alternative 2 would provide new or improved intercity passenger rail service throughout the project study area, with potential connections to existing intermodal services. The proposed new service in southwest Vermont would provide a key link along the “Western Corridor” in Vermont, which would advance the goal of a continuous integrated rail system in New England.

This alternative can be implemented using established, active rail lines. It includes proposed rail infrastructure improvements to improve maximum allowable operating speeds and provide for additional capacity. The proposed capital improvements would be expected to be completed without impacting existing freight or passenger rail operations. Compared to the other alternatives, Alternative 2 would require higher capital costs because most of the project study segments require infrastructure improvements. This alternative proposes operating additional service on most of the project study segments. Table A-1 in Attachment 1 lists the anticipated improvements needed to accommodate additional service on each segment. Table 4 shows the aggregated costs for each

alternative. Compared to the other alternatives, the O&M costs for Alternative 2 are anticipated to be moderate and similar to those expected for Alternatives 3 and 4, given the similar daily mileage.

The proposed rail infrastructure improvements for Alternative 2 are intended to minimize impacts to existing freight and passenger rail.

### **Alternative 3 – New Service to Manchester**

Alternative 3 would provide new intercity passenger rail service to southwest Vermont, with potential connections to existing intermodal services.

This alternative can be implemented using established, active rail lines and includes proposed rail infrastructure improvements to improve maximum allowable operating speeds. It is anticipated that the proposed capital improvements could be completed without impacting existing freight rail operations. Compared to the other alternatives, Alternative 3 is anticipated to require the lowest capital investment and the O&M costs are expected to be moderate and similar to those expected for Alternatives 2 and 4, given the similar daily mileage.

Alternative 3 is not anticipated to impact the existing freight operations and there is no existing passenger rail service in southwest Vermont.

### **Alternative 4 – New Service to Rutland**

Alternative 4 would provide new intercity passenger rail service to southwest Vermont, with potential connections to existing intermodal services. The proposed new service in southwest Vermont would provide a key link in the “Western Corridor” in Vermont, which will advance the goal of a continuous integrated rail system in New England.

This alternative can be implemented using established, active rail lines and includes proposed rail infrastructure improvements to increase maximum allowable operating speeds. It is anticipated that the proposed capital improvements could be completed without impacting existing freight rail operations. Compared to the other alternatives, Alternative 4 is expected to require moderate capital investment and the O&M costs are projected to be moderate and similar to those expected for Alternatives 2 and 3, given the similar daily mileage.

Alternative 4 is not anticipated to impact the existing freight operations and there is no existing passenger rail service in southwest Vermont.

### Alternative 5 – Rerouted Ethan Allen Service

Alternative 5 would provide new intercity passenger rail service to southwest Vermont, while reducing one round trip per day on the New York side of the study area. There would be potential new connections to existing intermodal services in Vermont, with a reduction in the opportunities for intermodal connections in Schenectady and Saratoga Springs. The proposed new service in southwest Vermont would provide a key link along the “Western Corridor” in Vermont, which would advance the goal of a continuous integrated rail system in New England.

This alternative can be implemented using established, active rail lines and includes proposed rail infrastructure improvements to improve maximum allowable operating speeds. It is anticipated that the proposed capital improvements could be completed without impacting existing freight rail operations. Compared to the other alternatives, Alternative 5 would require moderate capital investment and have the lowest impact in terms of additional O&M costs.

On the Vermont side of the study area, Alternative 5 is not anticipated to impact the existing freight operations and there is no existing passenger rail service. On the New York side of the study area, there would be a reduction in passenger rail service which will provide greater capacity for freight operations.

### Alternative 6 – Split Shuttle Service

This alternative would provide new or improved intercity passenger rail service throughout the project study area, with potential connections to existing intermodal services. The proposed new service in southwest Vermont would provide a key link in the “Western Corridor” in Vermont, which would advance the goal of a continuous integrated rail system in New England.

This alternative can be implemented using established, active rail lines. It includes proposed rail infrastructure improvements to increase maximum allowable operating speeds and provide additional capacity. It is anticipated that the proposed capital improvements could be completed without impacting existing freight or passenger rail operations. Compared to the other alternatives, Alternative 6 has the highest anticipated capital investment to implement the service, since this alternative would necessitate improvements to the most analysis segments in the study area (similar to Alternative 2). Alternative 6 is anticipated to have the highest annual O&M costs since the proposed service would have the highest daily roundtrip train miles and would require two sets of additional equipment (and crews) in addition to the existing service.

The proposed rail infrastructure improvements are intended to minimize impacts to existing freight and passenger rail; however, additional passenger

service on the New York side of the study area could lead to capacity issues depending on projected future freight traffic.

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## A.2.4 Economic/Sustainable Development

During the Phase One screening, the main factor considered in evaluating how well the proposed alternatives will support the economic development and sustainable development goals of the project was the potential for providing an attractive, convenient option to access activity centers and commercial hubs in the study area. The ridership forecasts, presented in detail in Section A.3, provide a good indication of that potential to circulate residents throughout the study area and the potential to bring in visitors into the region.

### Alternative 1 – No-Build

Alternative 1 is anticipated to do little to support improved economic development or sustainable development in the project study area. The continued lack of access to intercity passenger rail in a significant portion of the study area will continue to limit the connectivity to activity centers and commercial hubs for both residents and visitors in western Vermont. Alternative 1 does not improve freight rail capacity or speeds.

### Alternative 2 – Loop Service

By extending intercity passenger rail service into southwest Vermont, Alternative 2 would improve connectivity to activity centers and commercial hubs throughout the project study area; however, the loop routing would likely be an unattractive choice to riders, limiting economic and sustainable development opportunities.

The infrastructure improvements that would be required to implement Alternative 2 could also translate to economic benefits for freight service via potential improved freight travel times and increased capacity.

### Alternative 3 – New Service to Manchester

Alternative 3 is anticipated to improve connectivity to activity centers and commercial hubs in the vicinity of the proposed new service, especially near the proposed new stations in Mechanicville, North Bennington and Manchester. The lack of a direct link between Manchester and Rutland, however, would likely limit economic and sustainable development opportunities. The impacts of the link between Manchester and Rutland are evident in the ridership analysis – Alternative 3 has a significantly lower forecast ridership than does Alternative 4, which includes the connection to Rutland.

The infrastructure improvements that would be required to implement Alternative 3 could also translate to economic benefits for freight service to Manchester and Bennington via potential improved freight travel times and increased capacity.

#### **Alternative 4 – New Service to Rutland**

Alternative 4 is anticipated to improve connectivity to activity centers and commercial hubs near the proposed new service area, especially near the proposed new stations in Mechanicville, North Bennington, Manchester, and Rutland. It is anticipated to have good potential to support economic and sustainable development opportunities due to improved connectivity in southwest Vermont and efficient routing; Alternative 4 is forecast to have the highest increase in ridership by the horizon year of 2030.

Alternative 4 would also impart economic benefits to freight service in southwest Vermont via proposed rail infrastructure improvements to allow for greater operating speeds and increased capacity.

#### **Alternative 5 – Rerouted Ethan Allen Service**

Alternative 5 is anticipated to improve connectivity to activity centers and commercial hubs in proximity to the proposed new service area, especially near the proposed new stations in Mechanicville, North Bennington, Manchester, and Rutland. The impacts of the reduction in service at several of the stations served by the Ethan Allen current routing of the Ethan Allen may not be as severe as indicated by the ridership projection for this alternative as compared to the others. The forecast ridership for Alternative 5 is the lowest for the build alternatives that were modeled; however, it should be noted that the riders at the stations that would lose a frequency of service with this Alternative would continue to have options to access rail service either via other Amtrak services (the Adirondack in the case of the Fort Edward and Saratoga Springs stations) or by accessing a nearby station (Rutland Station, which is 13 miles from Castleton).

Alternative 5 would impart limited economic benefits to freight service in Southwest Vermont via proposed rail infrastructure improvements to allow greater operating speeds; removing the two trains per day for passenger service on some of the current Ethan Allen rail segments may also benefit travel times and increased capacity for freight service on those segments.

#### **Alternative 6 – Split Shuttle Service**

Alternative 6 is anticipated to provide connectivity to activity centers and commercial hubs throughout the project study area. It is anticipated to have good potential to support economic and sustainable development opportunities due to improved connectivity in southwest Vermont, and an additional

frequency of passenger service on the New York side of the study area; however, the fact that this would be a connecting service (at Albany/Rensselaer) rather than a through service limits the attractiveness of the option. The forecast ridership for this alternative is significantly lower than the ridership forecast for Alternative 4 – likely due to the penalty that riders tend to place on having to make a rail connection, which can be inconvenient and diminish time savings over other travel options. This penalty and the subsequent negative impact on ridership would reduce the benefit of Alternative 6 on economic development.

Alternative 6 would also impart economic benefits to freight service throughout the study area via proposed rail infrastructure improvements to allow for greater operating speeds and increased capacity.

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#### A.2.4 Environmental Quality

Both the Vermont and New York State Rail Plans identify one of their missions as promoting environmental responsibility in the overall transportation system, thereby contributing to environmental sustainability and quality of life. At this level of review, the factors considered to gauge whether the proposed alternatives support the environmental quality goals of the region consisted of a desktop review, using existing GIS data and other available information, to determine if the alternatives will have apparent potential positive or negative impacts within the study area.

For the purposes of the environmental review, the same 10 analysis segments presented previously were used. Each segment was reviewed to determine the potential environmental impacts that would occur based on the additional frequency of train service proposed by each of the alternatives. In short, the analysis shows that, because the alternatives use existing infrastructure, environmental effects would be minimal and consistent with the goals of maintaining environmental quality.

Table A13 in Attachment 3 summarizes the anticipated impacts along each of the analysis segments. In general, the greatest potential for significant environmental impacts is expected along Segment 5, specifically those impacts that will come from reconstructing the wye connections at the north and south end of the segment. If the CP Colonie were used as the routing from Mechanicville, New York to Albany/Rensselaer, Segment 5 would be common to all of the proposed alternatives. This being the case, the environmental impacts associated with Segment 5 are not a differentiator between the various alternatives; however, these impacts will be taken into account as the final routing is chosen from Mechanicville, New York to Albany/Rensselaer (during Phase Two). Environmental impacts will be further discussed as part of the environmental (NEPA) documentation for this study.

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### A.3 Alternatives Screening using Evaluation Criteria

Table 5 indicates how each proposed alternative performs in relation to the identified evaluation criteria. It should be noted that each alternative is evaluated *in comparison to the other alternatives* to identify which alternatives have the best potential to satisfy the project Purpose and Need. Based on the outcomes of the initial market analysis, the estimated capital and O&M requirements and costs for each alternative, and a comparison of the alternatives to each other with regards to the anticipated transportation and connectivity benefits each could have based on the proposed routings, each alternative has been assigned a “Positive”, “Negative” or “Neutral” impact for each criteria using the symbols indicated in Table 5.

Table A5 includes a summary of the evaluation rankings for all of the alternatives; tables A14 through A19 in Attachment 4 include brief justifications describing why each alternative received a particular ranking.

**Table A5 - Evaluation Rankings Summary**

| Screen One Criteria<br><br>As compared to the other alternatives, would the proposed alternative:  | Alternatives       |                       |                                    |                                 |                                       |                                |
|--|--------------------|-----------------------|------------------------------------|---------------------------------|---------------------------------------|--------------------------------|
|  | Alt. 1 – No- Build | Alt. 2 – Loop Service | Alt. 3 – New Service to Manchester | Alt. 4 – New Service to Rutland | Alt. 5 – Rerouted Ethan Allen Service | Alt. 6 – Split Shuttle Service |
| <b>Rail Access and Mobility</b>  |                    |                       |                                    |                                 |                                       |                                |
| Improve regional mobility and rail access to key destinations within the project study area?   | ○                  | ●                     | ●                                  | ●                               | ●                                     | ●                              |
| Lead to travel time savings for potential passengers, as compared to existing travel modes (i.e. rail, car, bus)?  | ○                  | ○                     | ●                                  | ●                               | ●                                     | ●                              |
| Provide a frequency of service and/or routing that would make it an attractive transportation option?  | ○                  | ○                     | ●                                  | ●                               | ●                                     | ●                              |
| <b>Transportation Efficiencies</b>   |                    |                       |                                    |                                 |                                       |                                |
| Provide viable and useful intermodal connections?  | ○                  | ●                     | ●                                  | ●                               | ●                                     | ●                              |
| Be generally cost efficient in terms of order of magnitude costs?  | ●                  | ○                     | ●                                  | ●                               | ●                                     | ○                              |
| Maximize use of the existing infrastructure?   | ●                  | ●                     | ●                                  | ●                               | ●                                     | ●                              |
| Minimize impacts on existing freight and passenger rail operations (post implementation)?  | ●                  | ○                     | ●                                  | ●                               | ●                                     | ○                              |
| Require supporting infrastructure that can be built with minimum impact on the operations of existing freight and passenger rail services during construction? | ●                  | ●                     | ●                                  | ●                               | ●                                     | ●                              |
| <b>Economic/Sustainable Development</b>  |                    |                       |                                    |                                 |                                       |                                |
| Support or promote opportunities for Smart Growth & Economic Development?  | ○                  | ○                     | ●                                  | ●                               | ●                                     | ●                              |
| <b>Environmental Quality</b>   |                    |                       |                                    |                                 |                                       |                                |
| Minimize potential environmental impacts?  | ●                  | ●                     | ●                                  | ●                               | ●                                     | ●                              |
| Result in any potentially positive environmental impacts?  | ●                  | ●                     | ●                                  | ●                               | ●                                     | ●                              |

● = Potential Positive Impact    ● = No/Neutral Impact    ○ = Potential Negative Impact

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## Preliminary Screening

Following the first stage of assessment summarized in the preceding sections; it was determined that ridership forecasts were a critical and should be developed to support the Phase One evaluation of alternatives. Although all of the proposed build alternatives were screened as part of the previously discussed analyses, it was determined that Alternative 2 would be eliminated from further consideration prior to development of the ridership model.

After the preliminary screening of the alternatives, it was determined that Alternative 2 should be removed from consideration because other alternatives (Alternatives 4 and 6) offered the same level of access to rail throughout the study region, while offering a routing that would be more attractive for riders. The single-direction loop routing of Alternative 2 would be inconvenient for many of the trip pairs in the region (e.g. For a counter-clockwise routing for Alternative 2, travelers from Albany to N. Bennington would be offered a convenient route but the return trip would be significantly less convenient – requiring riders to travel through Rutland, and around the loop to return back to Albany. Similar issues would occur for a clockwise routing for Alternative 2.), and a bi-directional routing (with two trains, one in each direction) is infeasible because of the operating and maintenance costs that would be associated with such a service. For these reasons, no ridership projection was prepared for Alternative 2. The remaining alternatives were all evaluated for their ridership potential before concluding the Phase One screening.

## Ridership Projections

Ridership forecasts were prepared for both routings from Mechanicville, New York to Albany/Rensselaer; Tables A6 and A7 show the resulting forecasts.

**Table A6 - Annual Ridership Forecasts<sup>1</sup> (Schenectady Routing)**

| STATION                          | FORECAST RIDERSHIP (2030) <sup>1</sup> |               |                |                |                |                |
|----------------------------------|--|---------------|----------------|----------------|----------------|----------------|
|                                  | 2010 Baseline                          | No-Build      | ALT 3          | ALT 4          | ALT 5          | ALT 6          |
| Montreal - Ft. Ticonderoga       | 5,200                                  | 5,700         | 5,700          | 5,700          | 5,700          | 5,700          |
| Rutland                          | 8,100                                  | 11,800        | 11,000         | 15,600         | 15,900         | 11,900         |
| Castleton                        | 1,300                                  | 1,800         | 1,900          | 1,900          | 0              | 2,000          |
| Whitehall                        | 900                                    | 1,000         | 1,000          | 1,000          | 1,000          | 1,000          |
| Fort Edward/Glens Falls          | 4,300                                  | 4,600         | 4,700          | 4,700          | 3,600          | 4,800          |
| Saratoga Springs                 | 15,100                                 | 16,600        | 16,800         | 16,800         | 12,900         | 17,100         |
| Schenectady                      | 8,100                                  | 8,400         | 9,000          | 9,000          | 8,800          | 9,400          |
| Manchester                       | --                                     | --            | 3,100          | 3,300          | 3,400          | 3,000          |
| N. Bennington                    | --                                     | --            | 4,600          | 4,800          | 5,200          | 4,400          |
| Mechanicville                    | --                                     | --            | 3,500          | 3,500          | 3,700          | 3,200          |
| Albany/Rensselaer                | 3,200                                  | 3,400         | 3,400          | 3,600          | 3,500          | 3,400          |
| Hudson – NY Penn                 | 32,400                                 | 35,900        | 44,200         | 47,300         | 43,300         | 44,000         |
| <b>TOTAL</b>                     | <b>78,600</b>                          | <b>88,200</b> | <b>108,900</b> | <b>116,200</b> | <b>107,000</b> | <b>109,900</b> |
| <i>Incremental over No-Build</i> | --                                     | --            | 20,700         | 28,000         | 18,800         | 21,700         |

<sup>1</sup> One-way boardings.

**Table A7 - Annual Ridership Forecasts<sup>1</sup> (CP Colonie Routing)**

| STATION                                     | FORECAST RIDERSHIP (2030) <sup>1</sup> |               |                |                |                |                |
|---|--|---------------|----------------|----------------|----------------|----------------|
|   | 2010 Baseline                          | 2030 No-Build | 2030 ALT 3     | 2030 ALT 4     | 2030 ALT 5     | 2030 ALT 6     |
| Montreal - Ft. Ticonderoga                  | 5,200                                  | 5,700         | 5,700          | 5,700          | 5,700          | 5,700          |
| Rutland                                     | 8,100                                  | 10,800        | 11,000         | 15,600         | 17,000         | 12,700         |
| Castleton                                   | 1,300                                  | 1,800         | 1,900          | 1,900          | 0              | 2,000          |
| Whitehall                                   | 900                                    | 1,000         | 1,000          | 1,000          | 900            | 1,000          |
| Fort Edward/Glens Falls                     | 4,300                                  | 4,600         | 4,700          | 4,700          | 3,600          | 4,800          |
| Saratoga Springs                            | 15,100                                 | 16,600        | 16,800         | 16,800         | 12,900         | 17,100         |
| Schenectady                                 | 8,100                                  | 8,400         | 9,000          | 9,000          | 8,800          | 9,400          |
| Manchester                                  | --                                     | --            | 3,700          | 3,800          | 3,800          | 3,400          |
| N. Bennington                               | --                                     | --            | 5,700          | 5,900          | 5,900          | 4,900          |
| Mechanicville                               | --                                     | --            | 4,200          | 4,200          | 4,200          | 3,600          |
| Albany/Rensselaer                           | 3,200                                  | 3,400         | 3,400          | 3,700          | 3,600          | 3,500          |
| Hudson – NY Penn                            | 32,400                                 | 35,900        | 47,200         | 51,000         | 46,300         | 46,000         |
| <b>TOTAL</b>                                | <b>78,600</b>                          | <b>88,200</b> | <b>114,200</b> | <b>123,300</b> | <b>112,700</b> | <b>114,100</b> |
| <i>Incremental over No-Build</i>            | --                                     | --            | 26,000         | 35,100         | 24,500         | 25,900         |
| <i>Incremental over Schenectady Routing</i> | --                                     | --            | 5,700          | 7,100          | 5,700          | 4,200          |

<sup>1</sup> One-way boardings.

Tables A6 and A7 show the forecasts of the ridership at each station within the study area. The figures in the tables represent the anticipated ridership (boardings) on ALL (existing and proposed) intercity passenger rail services at each stop; and therefore include, as appropriate, the expected ridership on the Ethan Allen service, the Adirondack service and the proposed new service. The ridership forecasts are another tool to help differentiate among the alternatives and identify which alternatives show the greatest potential benefit. At the bottom of each table is a row that indicates the incremental increase in ridership that the Alternative produces over and above the No-Build alternative; Table 6 also includes a row indicating the forecast additional ridership using the CP Routing rather than the Schenectady Routing from Mechanicville, New York to Albany/Rensselaer.

### Forecast Reasonableness Check

The reasonableness check of the ridership projections was made by examining another method of evaluating ridership potential, specifically ridership resulting from visitation. Visitors are a major factor in Vermont’s economy and the ability of each alternative to provide access for visitors is an important consideration. The visitation analysis presented below is intended to assess whether the ridership forecast by the model is reasonable in light of observed past rail ridership based on visitation.

Because Vermont already has intercity rail service to numerous resort destinations, a review of the performance of Amtrak service relative to observed visitors was considered a valid method of assessing rail ridership. Of the stations Amtrak serves in Vermont the stations selected for this analysis were:

- Essex Junction
- Randolph
- Rutland
- St. Albans
- Waterbury
- Montpelier Junction

Table A8 provides the number of boardings and alightings reported at the selected Amtrak stations in Vermont in 2007. Waterbury and Montpelier Junction are combined because they are both located in Washington County.

**Table A8 - Boardings and Alightings at Selected Vermont Amtrak Stations**

| Station                           | Riders On     | Riders Off    | Total On's & Off's |
|-----------------------------------|---------------|---------------|--------------------|
| Essex Junction                    | 5,999         | 6,269         | 12,268             |
| Randolph                          | 621           | 677           | 1,298              |
| Rutland                           | 8,065         | 8,237         | 16,302             |
| St. Albans                        | 1,255         | 1,052         | 2,307              |
| Waterbury and Montpelier Junction | 4,094         | 4,101         | 8,195              |
| <b>TOTALS</b>                     | <b>20,034</b> | <b>20,336</b> | <b>40,370</b>      |

Stations that abut adjacent states were omitted because the analysis depends on knowing the number of visitors, and visitor information for adjacent counties in neighboring states was not available.

The most recent study of Vermont visitation that provided sufficient detail for this analysis is “The Travel and Tourism Industry in Vermont” published in 2008 by the Vermont Department of Tourism and Marketing and based on 2007 data. This report indicated that 59% of all visitors spent one or more nights in Vermont in 2007. Since visitors are very unlikely to use rail to make a day-trip (partly due to when the trains arrive and depart and also due to the travel time entailed), this means the visitor market potentially served by rail is around 59% of the total visitor market.

The number of visitors to each Vermont County in 2007 is provided in Table A9 along with the calculation of overnight visitors and the resulting number of trips both entering and leaving Vermont (two per visitor). The result is a rough estimate of the number of visitor trips to and from each county in 2007.

**Table A9 - Visitors, Overnight Visits and Trips in 2007 by County**

| County              | 2007 Visitors | Overnight | Trips To and From |
|---------------------|---------------|-----------|-------------------|
| Addison             | 423,932       | 250,120   | 500,239           |
| Orange              | 167,667       | 98,923    | 197,847           |
| Bennington          | 979,079       | 577,656   | 1,155,313         |
| Caledonia           | 250,665       | 147,892   | 295,785           |
| Chittenden          | 2,602,284     | 1,535,348 | 3,070,695         |
| Essex/Orleans       | 336,461       | 198,512   | 397,024           |
| Franklin/Grand Isle | 399,461       | 235,682   | 471,364           |
| Lamoille            | 1,409,406     | 831,549   | 1,663,099         |
| Rutland             | 1,348,455     | 795,589   | 1,591,177         |
| Washington          | 722,744       | 426,419   | 852,838           |
| Windham             | 1,000,579     | 590,342   | 1,180,683         |
| Windsor             | 1,419,557     | 837,539   | 1,675,077         |

Assuming all of the reported Amtrak on’s and off’s were visitors (a liberal assumption), Table A10 calculates the percentage of visitor trips that were potentially made using Amtrak service. The overall average is 0.57% and the percentage for Rutland is 1.02%. Rutland is most relevant because it is in the Western Corridor, already has Amtrak service, and will be a part of whichever alternative is selected.

**Table A10 - Rail On's and Off's vs. Visitor Trips**

| Station                           | County           | Relevant Visitor Trips | Total On's and Off's | Rail as % of Total |
|-----------------------------------|------------------|------------------------|----------------------|--------------------|
| Essex Junction                    | Chittenden       | 3,070,695              |                      | 0.40%              |
| Randolph                          | Orange & Addison | 698,086                | 1,298                | 0.19%              |
| Rutland                           | Rutland          | 1,591,177              | 16,302               | 1.02%              |
| St. Albans                        | Franklin         | 471,364                | 2,307                | 0.49%              |
| Waterbury and Montpelier Junction | Washington       | 852,838                | 8,195                | 0.96%              |
| <b>Total</b>                      |                  | <b>8,389,836</b>       | <b>40,370</b>        | <b>0.57%</b>       |

According to a tourism analyses provided by the Vermont Department of Tourism and Marketing using 2007 data, Bennington County had 979,079 visitors. Adjusting for the percent of visitors likely to have remained overnight (59%), and counting their trips both to and from Bennington County would represent 1,155,313 trips. Therefore, if there were rail service to Bennington County and the 0.57% to 1% of the visitors elected to use rail service to visit, from 6,585 to 11,553 of those visitors to Bennington County would arrive by rail.

The projected ridership level of Bennington County stations (Manchester and North Bennington) ranged from 7,400 to 9,700, well within the range experienced by other Vermont visitor destinations.

To understand Rutland's performance as compared to Manchester and North Bennington it is useful to recall that riders of an intercity rail service will be predominantly people who drive (or take a shuttle bus from a resort) to the station. An extremely small percentage will walk, unlike those using urban transit systems to go to work on a daily basis. This means the catchment area for intercity passenger rail service will be much larger than would be the case with urban transit systems.

In the Western Corridor the roads and topography create a true corridor situation - with the Vermonter and Adirondack lines bounding the east and western edges of the catchment area for all of the Western Corridor stations. As noted, the northern end of the potential service area would extend into Addison County while it would be bounded to the north east by Vermonter service to Montpelier and Waterbury.

The Rutland catchment area is significantly larger than that of Manchester or North Bennington, extending to the north and east and including Addison County. For Manchester/North Bennington the catchment area is bounded by the same mountains that define the Western Corridor to the east and west, while Rutland to the north competes for visitors, limiting Bennington County's stations catchment area in that direction.

In short, the Rutland Station serves a larger area and more resorts. Whether the riders live in Vermont or visit Vermont the catchment area of the stations will reflect the same constraints and the Rutland Station will have a much larger

catchment area.

Table A11 shows the approximate travel times to Western Corridor stations and Vermonter stations.

**Table A11 - Travel Times to Western Corridor Resorts**

| Resort         | Amtrak Vermonter Station | Travel Time (minutes) | Western Corridor Station | Travel Time (minutes) |
|----------------|--------------------------|-----------------------|--------------------------|-----------------------|
| Pico Mountain  | White River Junction     | 57                    | Rutland                  | 33                    |
| Okemo          | Windsor                  | 48                    | Rutland                  | 38                    |
| Bromley        | Bellows Falls            | 51                    | Manchester               | 11                    |
| Magic Mountain | Bellows Falls            | 38                    | Manchester               | 28                    |
| Stratton       | Brattleboro              | 55                    | Manchester               | 28                    |
| Mount Snow     | Brattleboro              | 49                    | North Bennington         | 60                    |

The only resort of those selected that would be unlikely to use a Western Corridor station is Mount Snow, which would still be closer to Brattleboro than North Bennington.

Table A12 shows the travel projections, the annual number of visitors by county for 2007, and the 2010 population.

**Table A12 - Alternative 5 Ridership, County Population and Visitation Statistics**

| Ridership Projection                  | Alternative 5 Riders | 2007 Visitors    | 2010 Population |
|---------------------------------------|----------------------|------------------|-----------------|
| Rutland County                        | 15,900               | 1,348,455        | 61,642          |
| Addison County                        |                      | 432,900          | 36,821          |
| <b>Rutland and Addison Counties</b>   | <b>15,900</b>        | <b>1,781,355</b> | <b>98,463</b>   |
| Bennington County                     | 8,600                | 979,079          | 37,125          |
| Bennington/Rutland                    | 54%                  | 73%              | 60%             |
| <b>Bennington/(Rutland + Addison)</b> | <b>54%</b>           | <b>55%</b>       | <b>38%</b>      |

The percentage of rail trips projected to come to Bennington County is comparable – and almost identical – when Addison County is included with Rutland to the percentage of visitors. The percent of population in Bennington is smaller than the ridership split between Rutland and Bennington, so the projections actually project more riders than population alone would explain.

Finally, the adjacent station to the south and west of North Bennington, Mechanicville, will split the market between the two stations to some degree, limiting its catchment area with respect to what Rutland now has.

At this level of analysis it is unwise to focus on individual stations projections. The use of this information is to assess the performance between the alternatives, not between stations.

The factors that affect ridership include at least:

- Visitation – the number of visitors to Vermont who come to recreate
- Population, households and employment – the number of people and jobs in the service area
- Competing modes – the ease and cost of travel by other travel means

Of these factors the demographic measures of population and households and the characteristics of the transportation system were readily available for use in projecting travel in the study area for the future years needed for this analysis. The competing modes were also used in making the projections as measured by changes in travel times as projected. The underlying assumption in using demographic measures and travel times is that they are, themselves, driven by other factors, including visitors. While it would be possible to develop estimates of future visitation based on population of the markets served, projections into the distant future of visitation do not exist at least in part because the number of variables affecting visitation are inherently unpredictable over the long term, as the number of visitors Vermont experiences is affected by the economy, fuel costs, larger demographic trends (E.G. age distribution of the population), the presence of alternative competing destinations and even the weather. For this reason it was decided that while visitors are clearly the major factor affecting rail travel to Vermont, it could not be used as the basis for the projections needed for this study.

The conclusion of this assessment, using historic visitation and rail travel figures, is that the ridership projections generated by the model are reasonable.

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## A.4 Alternatives Advancing to the Phase Two Screening

The section provides a brief summary of the major advantages and disadvantages for each of the Phase One alternatives, as well as recommendations regarding which alternatives should advance into the Phase Two Screening.

### Alternative 1 – No-Build

The main advantage of the No-Build Alternative is that it has no implementation costs (capital or operating) associated with it. The major disadvantage of the No-Build Alternative is that those areas currently lacking intercity passenger rail service will continue to be unserved.

The No-Build Alternative will be carried through the two-phase screening process to meet NEPA requirements.

### Alternative 2 – Loop Service

Although Alternative 2 would provide new service to currently unserved areas in southwest Vermont, it was determined early in the process that the loop routing would prove to be inefficient and, therefore, unattractive to potential choice riders. Alternative 2 would also be one of the most expensive alternatives to implement, since capital improvements would be required on most of the analysis segments throughout the study area by this alternative.

In consultation with the Project Management Team, Alternative 2 was eliminated from further consideration prior to developing ridership projections. The alternative was eliminated because potential negative impacts are expected for five of the eleven Phase One criteria, while a positive impact is expected for only one.

### Alternative 3 – New Service to Manchester

Alternative 3 would provide new service to Bennington County (with stations in Manchester and North Bennington); however the lack of connectivity between Manchester and Rutland has been criticized by project stakeholders who note the substantial demand for travel between these two areas. The impact of the missing Manchester-Rutland ridership link is apparent in the ridership forecast; Alternative 3 is anticipated to produce the second lowest increase in ridership, better only than Alternative 5 which actually removes service from a portion of the study area.

This alternative is anticipated to require the lowest capital cost expenditure (since the service area, and therefore amount of track that needs to be improved,

is smaller than the other build alternatives); however, a maintenance facility would be required if Manchester is used as a terminal stop. This maintenance facility would be abandoned if the service were eventually extended to Rutland. The anticipated operating costs for Alternative 3 are moderate compared to the other build alternatives.

While no negative impacts are expected for any of the Phase One screening criteria, it is recommended that this alternative be removed from consideration and not move on to the Phase Two Screening. The lack of the rail connection between Manchester and Rutland is a key stakeholder concern, and that connection is addressed by other alternatives without the need to construct a new maintenance facility that could ultimately be abandoned.

### **Alternative 4 – New Service to Rutland**

Alternative 4 would provide new service to Rutland and Bennington Counties and provide a key link along Vermont's Western Corridor which has been identified as a key rail corridor for the state. Alternative 4 supports the goals and objectives stated in the project Purpose and Need and the anticipated capital and operating costs are moderate compared to the other alternatives. This alternative is also forecast to produce the greatest increase in annual ridership.

Alternative 4 is expected to have no negative impacts on any of the Phase One screening criteria; positive impacts are expected for six. It is recommended that Alternative 4 move forward into the Phase Two Screening for further evaluation.

### **Alternative 5 – Rerouted Ethan Allen Service**

Alternative 5 would provide new service to Rutland and Bennington Counties and provide a key link along Vermont's Western Corridor which has been identified as a key rail corridor for the state. This alternative is estimated to have the lowest operating cost of all of the build alternatives. The operating cost is a key consideration for the State of Vermont, which already sponsors the Ethan Allen and the Vermonter services.

The major disadvantage of Alternative 5 is that it would reduce service from portions of the New York side of the study area. This alternative is projected to produce the smallest increase in annual ridership – likely due to the reduction of service in a portion of the study area.

Alternative 5 is not expected to have negative impacts for any of the Phase One screening criterion, and positive impacts are expected for four. Given the importance of operating costs for the longevity of any service that is implemented, Alternative 5 is recommended to be carried forward to the Phase Two Screening for further evaluation.

## Alternative 6 – Split Shuttle Service

Alternative 6 will provide new service to Rutland and Bennington Counties and increased service to the New York portion of the study area. This alternative is projected to produce the second highest increase in annual ridership. Despite the additional service in New York for Alternative 6, which proposes connecting service in Albany/Rensselaer, Alternative 4 has higher ridership projections because it proposes through service at Albany/Rensselaer.

Due to the wide coverage Alternative 6 proposes, capital improvements would be required on most of the analysis segments by this alternative – making it one of the most expensive from a capital cost perspective. Alternative 6 would also have the highest operating cost of all the build alternatives.

Alternative 6 would have negative impacts for two of the Phase One screening criteria; positive impacts are expected for six. It is recommended that Alternative 6 be removed from consideration and not move on to the Phase Two Screening.

## Summary of Recommendations

From the initial set of alternatives the two Build Alternatives are recommended to advance to the Phase Two Screening process:

- Alternative 4 – New Service to Rutland
- Alternative 5 – Rerouted Ethan Allen Service

These two alternatives are recommended to move forward to the Phase Two analyses because, based on their performance in the Phase One Screening, they exhibit the greatest potential to satisfy the project Purpose and Need. During the Phase Two analysis, operating plans, operational analysis and refined capital and operating/maintenance costs will be developed for these two alternatives and the No-Build Alternative. Each alternative will also be subject to an environmental review sufficient to prepare environmental documentation that will satisfy NEPA requirements.

The routing from Mechanicville, New York to Albany/Rensselaer will be finalized during the Phase Two Screening process. An early action item in the next phase will be a meeting with CP Rail to confirm the infrastructure assumptions and order of magnitude capital costs associated with the Colonie and Schenectady routing options.

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# A-1

## Attachment 1 – Capital Cost Assumptions

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### 1 Capital Cost Assumptions

The existing rail corridors within the project study area that are being considered to accommodate the proposed alternatives include:

- ▶ Vermont Railway's (VTR) B&R Subdivision that extends between Rutland and Bennington, Vermont and from North Bennington, Vermont to Hoosick Junction, New York; and the Clarendon and Pittsford (CLP) Main Line between Whitehall, New York and Rutland, Vermont;
- ▶ Pan Am Railway's (PAR) Freight Main Line between Hoosick Junction and Mechanicville, New York;
- ▶ Canadian Pacific Rail's (CPR) Colonie Subdivision between Albany/Rensselaer and Mechanicville, New York; the Freight Subdivision between Mechanicville and Schenectady New York; and the Canadian Subdivision between Glenville and Whitehall, New York; and
- ▶ CSX's Hudson Subdivision between Albany/Rensselaer and Schenectady, New York.

The following sections include a description of the types of capital improvements, for both rail infrastructure and facilities that have been identified as being necessary to implement the proposed alternatives; and catalog the order of magnitude capital cost estimates by alternative.



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## 1.1 Rail Infrastructure

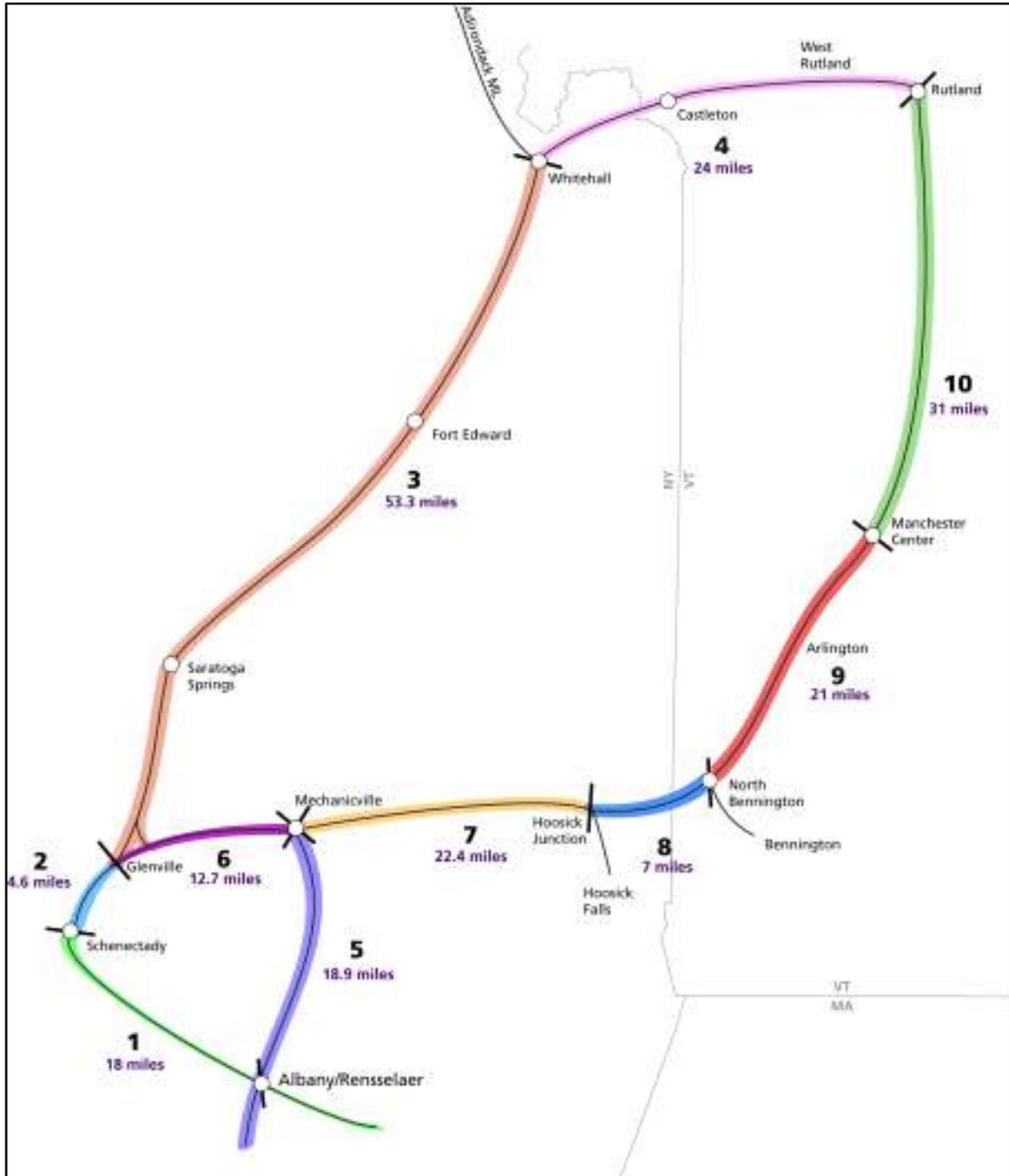
For the purposes of the Phase One Screening, the existing rail corridors in the project study area are divided into 10 segments, shown in Figure 1. Each segment was reviewed to determine the capital improvements necessary to accommodate additional passenger service; specifically one additional per day to correspond with the assumptions of the alternatives.

The conceptual analysis identified capital improvements that will increase capacity on the potential host railroads and allow for a proposed maximum operating speed (MAS) of 59 miles per hour (mph) for passenger operations. Table 1 indicates the types of capital improvements (including reconstruction of existing track, construction of new passing sidings, lengthening of existing passing sidings, and bridge reconstruction, as appropriate) have been assumed along each segment; Table 2 includes a breakdown of the capital cost estimate for each segment.

As noted in Table 2, Segment 5 – if used – would require the greatest capital expenditure to make the proposed routings feasible. The major investments on this segment include:

- Construction of a grade-separated connection between the CP Colonie Subdivision and the CSX Hudson Subdivision at the south end of Segment 5; and
- Construction of a wye connection between the CP Colonie Subdivision and the Pan Am Freight Mainline, to allow for the northbound to eastbound movement, at the north end of Segment 5.

Figure 1: Analysis Segments





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Table 1 - Proposed Rail Infrastructure Improvements

| Segment | Length (mi) | Line Segment  |                  |                  | Included in Alternative |   |   |   |   |   | Anticipated Infrastructure Improvements/Assumptions  |
|---------|-------------|---------------|------------------|------------------|-------------------------|---|---|---|---|---|--|
|         |             | Railroad      | From             | To               | NB                      | 2 | 3 | 4 | 5 | 6 |  |
| 1       | 18          | CSX           | Schenectady      | Albany           |                         | X | X | X | X | X | Assume no improvements required  |
| 2       | 4.6         | CPR           | CPF 480          | Schenectady      |                         | X | X | X | X | X | <ul style="list-style-type: none"> <li>• 2 miles of new sidings for congestion relief.</li> <li>• All existing public grade crossings will require warning system modifications.</li> <li>• No track work required on existing mainline; 50-foot wide crossings.</li> <li>• Signal system costs assume electronic in-track signal system and interlocking tie-ins.</li> </ul>  |
| 3       | 53.3        | CPR           | Whitehall        | CPF 480          |                         | X |   |   |   | X | <ul style="list-style-type: none"> <li>• 3 miles of new siding track in Glenville, New York area.</li> <li>• 5 miles of mainline track requires upgrading; all existing public grade crossings will require warning system modifications.</li> </ul>   |
| 4       | 24          | CLP (VRS)     | Rutland          | Whitehall        |                         | X |   |   |   | X | <ul style="list-style-type: none"> <li>• Wayside signal system on single mainline track with no sidings.</li> <li>• All existing public grade crossings will require warning system modifications.</li> </ul>  |
| 5       | 18.9        | CPR - Colonie | Mechanicville    | Albany           |                         | X | X | X | X | X | <ul style="list-style-type: none"> <li>• Every 3rd tie is replaced, 50% of segment requires additional surfacing and aligning of curvature to meet increased speeds.</li> <li>• Wye reconstruction of 1 mile of new track; new bridge across river; extend sidings with 2 miles of new track; 50-foot wide crossings.</li> <li>• Construct the connection between the CP Colonie Subdivision and the CSX Hudson Subdivision.</li> <li>• All existing public grade crossings will require warning system modifications.</li> </ul>  |
| 6       | 12.7        | CPR           | Mechanicville    | CPF 480          |                         | X | X | X | X | X | <ul style="list-style-type: none"> <li>• 6 miles of new sidings for congestion relief.</li> <li>• All existing public grade crossings will require warning system modifications.</li> <li>• No track work required on existing mainline; 50-foot wide crossings</li> <li>• Signal system costs assume electronic in-track signal system and interlocking tie-ins.</li> </ul>   |
| 7       | 22.4        | PAR           | Hoosick          | Mechanicville    |                         | X | X | X | X | X | <ul style="list-style-type: none"> <li>• 1 new 2-mile long siding midline; assume 2 existing sidings need no work. 50-foot wide crossings.</li> <li>• Updates to existing signal system.</li> <li>• All existing public grade crossings will require warning system modifications.</li> </ul>  |
| 8       | 7           | VTR (VRS)     | North Bennington | Hoosick          |                         | X | X | X | X | X | <ul style="list-style-type: none"> <li>• Existing mainline needs upgrading over entire length; 50-foot wide crossings.</li> <li>• Every 3rd tie is replaced, 50% of segment requires additional surfacing and aligning of curvature to meet increased speeds.</li> <li>• All existing public grade crossings will require warning system modifications.</li> <li>• No additional sidings required, bridge costs assumed only for bridges assessed to be in poor condition.</li> </ul>  |
| 9       | 21          | VTR (VRS)     | Manchester       | North Bennington |                         | X | X | X | X | X | <ul style="list-style-type: none"> <li>• Existing mainline needs upgrading over entire length; 50-foot wide crossings.</li> <li>• All existing public grade crossings will require warning system modifications.</li> <li>• Every 3rd tie is replaced, 50% of segment requires additional surfacing and aligning of curvature to meet increased speeds.</li> <li>• Upgrades to 1 existing siding (~2 miles);</li> <li>• Bridge costs assumed only for bridges assessed to be in poor condition.</li> <li>• Assumes VTR will allow passenger service without new signal system.</li> </ul>  |
| 10      | 31          | VTR (VRS)     | Rutland          | Manchester       |                         | X |   | X | X | X | <ul style="list-style-type: none"> <li>• Existing mainline needs upgrading over entire length; 50-foot wide crossings.</li> <li>• All existing public grade crossings will require warning system modifications.</li> <li>• Every 3rd tie is replaced; 50% of segment requires additional surfacing and aligning of curvature to meet increased speeds.</li> <li>• Upgrades to 1 existing sidings (~2 miles);</li> <li>• Bridge costs assumed only for bridges assessed to be in poor condition.</li> <li>• Assumes VTR will allow passenger service without new signal system.</li> </ul> |



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Table 2 - Analysis Segment Cost Breakdown

|  | New Siding Track |             | Upgrade Mainline Track |             | Upgrade Siding Track |           | Signal System | Grade Crossing - Public |             | Grade Crossing - Private |           | Grade Crossing - Warning System |             | Grade Crossing Signage - All |           | Undergrade Bridges |             | Grade Separation | Total <sup>1</sup> |
|--|------------------|-------------|------------------------|-------------|----------------------|-----------|---------------|-------------------------|-------------|--------------------------|-----------|---------------------------------|-------------|------------------------------|-----------|--------------------|-------------|------------------|--------------------|
|  | \$215            | TF          | \$60                   | TF          | \$50                 | TF        | LS            | \$3,000                 | TF          | \$5,000                  | EA        | \$200,000                       | EA          | \$5,000                      | LS        | \$500,000          | EA          |                  |                    |
|  | Quant.           | Cost        | Quant.                 | Cost        | Quant.               | Cost      |               | Quant.                  | Cost        | Quant.                   | Cost      | Quant.                          | Cost        | Quant.                       | Cost      | Quant.             | Cost        |                  |                    |
| Segment 1 - CSX (Schenectady-Albany)       | 0                | \$0         | 0                      | \$0         | 0                    | \$0       | \$0           | 0                       | \$0         | 0                        | \$0       | 0                               | \$0         | 0                            | \$0       | 0                  | \$0         | \$0              | \$0                |
| Segment 2 - CPR (CPF 480-Schenectady)      | 10,000           | \$2,150,000 | 0                      | \$0         | 0                    | \$0       | \$4,000,000   | 150                     | \$450,000   | 0                        | \$0       | 3                               | \$600,000   | 3                            | \$15,000  | 0                  | \$0         | \$0              | \$7,215,000        |
| Segment 3 - CPR (Whitehall-CPF 480)        | 15,000           | \$3,225,000 | 25,000                 | \$1,500,000 | 0                    | \$0       | \$0           | 0                       | \$0         | 0                        | \$0       | 0                               | \$0         | 0                            | \$0       | 0                  | \$0         | \$0              | \$4,725,000        |
| Segment 4 - CLP (Rutland-Whitehall)        | 0                | \$0         | 0                      | \$0         | 0                    | \$0       | \$5,000,000   | 0                       | \$0         | 0                        | \$0       | 24                              | \$4,800,000 | 0                            | \$0       | 0                  | \$0         | \$0              | \$9,800,000        |
| Segment 5 - CPR (Mechanicville-Albany)     | 0                | \$0         | 99,792                 | \$5,987,520 | 0                    | \$0       | \$0           | 2,100                   | \$6,300,000 | 4                        | \$20,000  | 42                              | \$8,400,000 | 46                           | \$230,000 | 0                  | \$0         | \$35,000,000     | \$55,937,520       |
| Segment 6 - CPR (Mechanicville-CPF 480)    | 31,680           | \$6,811,200 | 0                      | \$0         | 0                    | \$0       | \$8,000,000   | 300                     | \$900,000   | 2                        | \$10,000  | 6                               | \$1,200,000 | 8                            | \$40,000  | 0                  | \$0         | \$0              | \$16,961,200       |
| Segment 7 - PAR (Hoosick-Mechanicville)    | 10,000           | \$2,150,000 | 0                      | \$0         | 0                    | \$0       | \$4,000,000   | 500                     | \$1,500,000 | 7                        | \$35,000  | 10                              | \$2,000,000 | 17                           | \$85,000  | 0                  | \$0         | \$0              | \$9,770,000        |
| Segment 8 - VTR (No. Bennington-Hoosick)   | 0                | \$0         | 36,960                 | \$2,217,600 | 0                    | \$0       | \$0           | 300                     | \$900,000   | 5                        | \$25,000  | 6                               | \$1,200,000 | 11                           | \$55,000  | 2                  | \$1,000,000 | \$0              | \$5,397,600        |
| Segment 9 - VTR (Manchester-N. Bennington) | 0                | \$0         | 110,880                | \$6,652,800 | 10,000               | \$500,000 | \$0           | 800                     | \$2,400,000 | 21                       | \$105,000 | 16                              | \$3,200,000 | 37                           | \$185,000 | 9                  | \$4,500,000 | \$0              | \$17,542,800       |
| Segment 10 - VTR (Rutland-Manchester)      | 0                | \$0         | 163,680                | \$9,820,800 | 10,000               | \$500,000 | \$0           | 1050                    | \$3,150,000 | 57                       | \$285,000 | 21                              | \$4,200,000 | 78                           | \$390,000 | 5                  | \$2,500,000 | \$0              | \$20,845,800       |

<sup>1</sup> Base material and labor costs only. No contingencies included.



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## 1.2 Facilities

The alternatives described in the previous section identify ten station locations that could be included in future Amtrak service in the project study area:

- Rutland
- Manchester
- North Bennington
- Mechanicville
- Albany/Rensselaer
- Schenectady
- Ft Edwards/Glens Falls
- Saratoga Springs
- Whitehall
- Castleton

Seven of the ten locations have existing stations. Table 3 identifies the key station components for these seven existing stations. Three new stations are proposed in Manchester and North Bennington, Vermont, and Mechanicville, New York.

**Table 3 - Existing Station Data<sup>1</sup>**

| Station               | Staff     | Building/<br>Waiting Area | Parking                        | Platform                            | ADA<br>Accessibility             |
|-----------------------|-----------|---------------------------|--------------------------------|-------------------------------------|----------------------------------|
| Rutland               | Unstaffed | Building & waiting area   | 5 short-term,<br>30 long-term  | Low level<br>200' +/-               | Mini-High                        |
| Castleton             | Unstaffed | Building                  | 5 +/-                          | Low level<br>30' +/-                | None                             |
| Whitehall             | Unstaffed | Sheltered<br>waiting area | 3 short-term,<br>3 long-term   | Low level<br>100' +/-               | None <sup>3</sup>                |
| Fort Edward           | Unstaffed | Building                  | 4 short-term,<br>10 long-term  | Low level<br>100' +/-               | None <sup>3</sup>                |
| Saratoga<br>Springs   | Staffed   | Building                  | 40 short-term,<br>40 long-term | Low level<br>600' +/-<br>(2 tracks) | Wheelchair<br>Lifts <sup>3</sup> |
| Schenectady           | Staffed   | Building                  | 20 short-term,<br>30 long-term | Low level<br>600' +/- <sup>2</sup>  | None <sup>3</sup>                |
| Albany/<br>Rensselaer | Staffed   | Building                  | Garage                         | Multiple<br>elevated<br>platforms   | High level<br>platforms          |

<sup>1</sup> Existing station data is based on ridership data and photographs in the field.

<sup>2</sup> Double-sided platform with canopy.

<sup>3</sup> Plans to improve accessibility in progress.

The following general assumptions were used as a basis of the cost estimates.

- All of the stations, both existing and new, will be modified or built to meet current Amtrak station and ADA standards. Amtrak station design standards are shown in Figure 2.
- New stations will serve less than 4,000 annual passengers, qualifying them as Classification V stations, based on Amtrak station classifications.
- Platform lengths at the new station will be built to accommodate 3 passenger cars (300 feet +/-).
- All new station platforms will be meet level boarding requirements.
- All existing low level station platforms are exempt from the level boarding requirement based on agreements with the host freight railroads and will be retained.
- New stations will be constructed with 50 parking spaces. Existing stations without parking will have 50 parking spaces added.
- Existing station and highway signage meets current Amtrak requirements. New platform signage is required for all stations with reconstructed platforms.
- Whitehall Station will not be located as part of the proposed improvements.

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## **Proposed Station Improvements**

The proposed station improvements are based on the Amtrak station design standards shown in Figure 2. The proposed station design components and service features are based on the existing or projected annual ridership for each station.

### **Existing Stations**

Table 4 summarizes the proposed improvements and associated order of magnitude costs for the existing stations in the project study area. The listed improvements are proposed to ensure all stations fully meet the Amtrak station design standards and ADA standards.

Figure 2 - Amtrak Station Classifications and Features

| Physical Design and Service Features     |  | Classifications      |                    |                   |                       |                        |
|--|--|----------------------|--------------------|-------------------|-----------------------|------------------------|
|  |  | I                    | II                 | III               | IV                    | V                      |
|  |  | Large                | Medium             | Small/<br>Medium  | Small                 |                        |
|  |  | Staffed              | Staffed            | Caretaker         | Shelter/<br>Unstaffed | Platform/<br>Unstaffed |
| Projected Ridership Thresholds:          |  | Greater than 400,000 | 100,000 to 400,000 | 20,000 to 100,000 | 4,000 to 20,000       | Less than 4,000        |
| Facility Type                            | Platform   | ●                    | ●                  | ●                 | ●                     | ●                      |
|  | Platform canopy  | ●                    | ●                  | ●                 | ○                     |                        |
|  | Sheltered waiting area providing windbreak/weather protection                  |                      |                    |                   | ●                     |                        |
|  | Station building with restroom(s) and other amenities in conditioned structure | ●                    | ●                  | ●                 |                       |                        |
| Access and Wayfinding Elements           | Auto pick-up / drop-off  | ●                    | ●                  | ●                 | ○                     | ○                      |
|  | Parking  | ○                    | ●                  | ●                 | ○                     | ○                      |
|  | Rental cars  | ●                    | ○                  | ○                 |                       |                        |
|  | Bus access   | ○                    | ○                  | ○                 | ○                     |                        |
|  | Other transit access (bus, light/commuter rail)                                | ○                    | ○                  | ○                 | ○                     |                        |
|  | Taxi access  | ●                    | ●                  | ●                 | ○                     |                        |
|  | Bicycle racks  | ●                    | ●                  | ●                 | ○                     |                        |
|  | Station signage (Amtrak Standards)   | ●                    | ●                  | ●                 | ●                     | ●                      |
| Highway signage                          | ●  | ●                    | ●                  | ●                 | ●                     |                        |
| Customer Service Elements                | <b>Ticketing and Baggage</b>   |                      |                    |                   |                       |                        |
|  | Quik-Trak/eTicketing   | ●                    | ●                  | ●                 | ●                     | ○                      |
|  | Ticket office  | ●                    | ●                  |                   |                       |                        |
|  | Passenger boarding assistance  | ●                    | ●                  |                   |                       |                        |
|  | Checked baggage handling   | ●                    | ○                  |                   |                       |                        |
|  | Caretaker / greeter staff  |                      |                    | ●                 |                       |                        |
|  | <b>Passenger Information</b>   |                      |                    |                   |                       |                        |
|  | Passenger information display system (PIDS)                                    | ●                    | ●                  | ●                 | ○                     |                        |
|  | Pay telephones   | ●                    | ●                  | ○                 | ○                     |                        |
|  | Information counter  | ●                    | ○                  |                   |                       |                        |
|  | Customer service office  | ●                    |                    |                   |                       |                        |
|  | <b>Security</b>  |                      |                    |                   |                       |                        |
|  | Emergency platform call box  | ●                    | ●                  | ●                 | ●                     |                        |
|  | Security facilities on site  | ●                    |                    |                   |                       |                        |
| Security on call / systems               |  | ●                    | ○                  |                   |                       |                        |
| Local police surveillance / call box     |  |                      |                    | ○                 | ○                     |                        |
| ● Generally required for classification  |  |                      |                    |                   |                       |                        |
| ○ Optionally required for classification |  |                      |                    |                   |                       |                        |

**Table 4 - Proposed Station Improvements**

| Station               | Annual Ridership (FY 2010) | Station Class | Proposed Improvements  | Cost Estimate |
|-----------------------|----------------------------|---------------|--|---------------|
| Rutland               | 15,843                     | IV            | Emergency Platform Call Box  | \$20,000      |
| Castleton             | 1,734                      | V             | 50 Parking Spaces<br>Auto pick-up/drop off   | \$115,000     |
| Fort Edward           | 8,386                      | IV            | Emergency Platform Call Box<br>50 Parking Spaces<br>Auto pick-up/drop off  | \$135,000     |
| Saratoga Springs      | 29,678                     | III           | Bicycle Racks<br>Passenger Information Display System (PIDS)<br>Emergency Platform Call Box  | \$82,000      |
| Schenectady           | 55,458                     | III           | Bicycle Racks<br>Passenger Information Display System (PIDS)<br>Emergency Platform Call Box  | \$82,000      |
| Albany/<br>Rensselaer | 722,096                    | I             | The existing station generally meets the requirements for Classification I stations. There are no proposed improvements to this station. | \$0           |

**New Stations:**

Manchester, North Bennington, and Mechanicville Stations are projected to serve less than 4,000 annual passengers qualifying them as Classification V – Small Unsheltered/Unstaffed Stations, based on Amtrak station classifications. Table 5 summarizes the proposed improvements and associated order of magnitude costs for the existing stations in the project study area. The following design and service features are proposed to fully meet the Amtrak station design standards and ADA standards for the new stations

**Table 5 - Proposed New Stations**

| Station          | Proposed Station Class | Proposed Improvements  | Cost Estimate |
|------------------|------------------------|--|---------------|
| Mechanicville    | V                      | 300-foot High Level Platform<br>50 Parking Spaces<br>Auto pick-up/drop off | \$820,000     |
| North Bennington | V                      | 300-foot High Level Platform<br>50 Parking Spaces<br>Auto pick-up/drop off | \$820,000     |
| Manchester       | V                      | 300-foot High Level Platform<br>50 Parking Spaces<br>Auto pick-up/drop off | \$820,000     |

For Alternative 3 only, Manchester Station would be a terminal station, and as would be considered a Classification III Small/Medium Caretaker Station. Additionally a facility would be required to provide overnight layover areas, maintenance shops and facilities, and the necessary utilities to service the trains. Table 6 summarizes the proposed improvements to construct the necessary facilities for a terminal station in Manchester, Vermont.

**Table 6 - Manchester Station Facilities (Alternative 3 Only)**

| Facility Type       | Proposed Station Class | Proposed Improvements   | Cost Estimate <sup>1</sup> |
|---------------------|------------------------|---|----------------------------|
| Terminal Station    | III                    | 300' High Level Platform<br>Platform Canopy<br>Station Building with Restrooms<br>50 Parking Spaces<br>Auto pick-up/drop off<br>Bicycle Racks<br>Station/Highway Signage<br>Quik-Trak/eTicketing<br>Passenger Information Display System (PIDS)<br>Emergency Platform Call Box  | \$1,182,000                |
| Layover/Maintenance | N/A                    | Train layover siding with maintenance vehicle access drives. Layover area sufficient to accommodate 1 train consisting of 5 passenger cars and 2 locomotives (~640 feet)<br>Train layover area utility service (power, lighting, water, drainage, sewer)<br>Maintenance building with shop, bathroom, and employee areas<br>Employee parking area (10 spaces) | \$1,450,400                |

<sup>1</sup> Base material costs only. No contingencies included.

Table 7 includes a breakdown of the capital cost estimate for each facility.

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**Table 7 - Facility Cost Breakdown**

| Facility                                   | Site Preparation | High Level Platform |           | Platform Canopy |           | Station Building   |           | Station Signage | Highway Signage | Parking/Pick-up/Drop-off |           | Bicycle Rack |         | QuikTrak/eTicketing | PIDS     | Emergency Platform Call Box |          | Utility Service | Layover Area | Total       |
|--|------------------|---------------------|-----------|-----------------|-----------|--------------------|-----------|-----------------|-----------------|--------------------------|-----------|--------------|---------|---------------------|----------|-----------------------------|----------|-----------------|--------------|-------------|
|  | LS               | \$1,700             | FT        | \$500           | FT        | \$200              | SF        | LS              | LS              | \$2,300                  | Space     | \$2,000      | EA      | LS                  | LS       | \$20,000                    | EA       | LS              | LS           |             |
|  | Quant.           | Cost                | Quant.    | Cost            | Quant.    | Cost               | Quant.    | Cost            | Quant.          | Cost                     | Quant.    | Cost         | Quant.  | Cost                | Quant.   | Cost                        | Quant.   | Cost            | Quant.       |             |
| Rutland Station (Upgrades)                 | \$0              | 0                   | \$0       | 0               | \$0       | 0                  | \$0       | \$0             | \$0             | 0                        | \$0       | 0            | \$0     | \$0                 | \$0      | 1                           | \$20,000 | \$0             | \$0          | \$20,000    |
| Castleton Station (Upgrades)               | \$0              | 0                   | \$0       | 0               | \$0       | 0                  | \$0       | \$0             | \$0             | 50                       | \$115,000 | 0            | \$0     | \$0                 | \$0      | 0                           | \$0      | \$0             | \$0          | \$115,000   |
| Ft. Edward Station (Upgrades)              | \$0              | 0                   | \$0       | 0               | \$0       | 0                  | \$0       | \$0             | \$0             | 50                       | \$115,000 | 0            | \$0     | \$0                 | \$0      | 1                           | \$20,000 | \$0             | \$0          | \$135,000   |
| Saratoga Springs Station (Upgrades)        | \$0              | 0                   | \$0       | 0               | \$0       | 0                  | \$0       | \$0             | \$0             | 0                        | \$0       | 1            | \$2,000 | \$0                 | \$60,000 | 1                           | \$20,000 | \$0             | \$0          | \$82,000    |
| Schenectady Station (Upgrades)             | \$0              | 0                   | \$0       | 0               | \$0       | 0                  | \$0       | \$0             | \$0             | 0                        | \$0       | 1            | \$2,000 | \$0                 | \$60,000 | 1                           | \$20,000 | \$0             | \$0          | \$82,000    |
| Manchester Station (New)                   | \$150,000        | 300                 | \$510,000 | 0               | \$0       | 0                  | \$0       | \$40,000        | \$5,000         | 50                       | \$115,000 | 0            | \$0     | \$0                 | \$0      | 0                           | \$0      | \$0             | \$0          | \$820,000   |
| North Bennington Station (New)             | \$150,000        | 300                 | \$510,000 | 0               | \$0       | 0                  | \$0       | \$40,000        | \$5,000         | 50                       | \$115,000 | 0            | \$0     | \$0                 | \$0      | 0                           | \$0      | \$0             | \$0          | \$820,000   |
| Mechanicville Station (New)                | \$150,000        | 300                 | \$510,000 | 0               | \$0       | 0                  | \$0       | \$40,000        | \$5,000         | 50                       | \$115,000 | 0            | \$0     | \$0                 | \$0      | 0                           | \$0      | \$0             | \$0          | \$820,000   |
| Manchester - Terminal Station (Alt. 3)     | \$150,000        | 300                 | \$510,000 | 300             | \$150,000 | 500                | \$100,000 | \$40,000        | \$5,000         | 50                       | \$115,000 | 1            | \$2,000 | \$30,000            | \$60,000 | 1                           | \$20,000 | \$0             | \$0          | \$1,182,000 |
| Manchester - Layover/ Maintenance (Alt. 3) | \$100,000        | 0                   | \$0       | 0               | \$0       | 1,500 <sup>1</sup> | \$225,000 | 0               | \$0             | 10                       | \$23,000  | 0            | \$0     | 0                   | \$0      | 0                           | \$0      | \$1,000,000     | \$102,400    | \$1,450,500 |

<sup>1</sup> Maintenance Facility - \$150/SF



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### 1.3 Capital Cost Estimates by Alternative

Table 8 summarizes the capital cost estimates, by alternative, for both rail infrastructure and facility improvements assuming that the CP Colonie Subdivision (Segment 5) is used to get from Mechanicville to Albany/Rensselaer, New York. Table 9 provides capital cost estimates assuming that the route from Mechanicville, New York to Albany/Rensselaer, New York is by way of Schenectady, New York (Segments 1, 2 and 6). Both tables include a listing of all new or upgraded stations and all corridor segments that are affected by each alternative.

As shown in the tables Alternatives 2 and 6 are anticipated to require the largest capital expenditures, and Alternative 3 is anticipated to have the lowest capital cost requirement. Generally, those alternatives with greater route mileage are expected to have higher capital costs. Using the CP Colonie Subdivision (Segment 5) as the route between Mechanicville, New York and Albany/Rensselaer, New York is anticipated to be significantly more costly than the routing via Schenectady, New York (Segments 1, 2, and 6).

**Table 8 - Cost Estimate by Alternative (CP Colonie Routing)**

| Alternative   | Existing Stations to be Improved   | New Stations  | Corridor Segments | Rail Infrastructure Cost | Facility Cost | Equipment Cost <sup>1</sup> | Total Base Cost | Total Cost <sup>2</sup> |
|---|--|---|-------------------|--------------------------|---------------|-----------------------------|-----------------|-------------------------|
| Alt. 1 – No-Build                                       | No improvements  | No new stations.  | 1,2,3,4           | -                        | -             | -                           | -               | -                       |
| Alt. 2 – Loop Service                                   | Rutland, Castleton, Fort Edward/Glens Falls, Saratoga Springs, Schenectady | Mechanicville, N. Bennington, and Manchester              | 1-5,7-10          | \$131,233,720            | \$2,894,000   | \$13,000,000                | \$147,127,720   | \$210,392,640           |
| Alt. 3 – New Service to Manchester (Through Service)    | None   | Mechanicville, N. Bennington, and Manchester <sup>2</sup> | 5,7,8,9           | \$88,647,920             | \$4,272,500   | \$1,500,000                 | \$94,420,420    | \$135,021,201           |
| Alt. 3 – New Service to Manchester (Connecting Service) | None   | Mechanicville, N. Bennington, and Manchester <sup>3</sup> | 5,7,8,9           | \$88,647,920             | \$4,272,500   | \$13,000,000                | \$105,920,420   | \$151,466,201           |
| Alt. 4 – New Service to Rutland (Through Service)       | Rutland  | Mechanicville, N. Bennington, and Manchester              | 5,7,8,9,10        | \$109,493,720            | \$2,480,000   | -                           | \$111,973,720   | \$160,122,420           |
| Alt. 4 – New Service to Rutland (Connecting Service)    | Rutland  | Mechanicville, N. Bennington, and Manchester              | 5,7,8,9,10        | \$109,493,720            | \$2,480,000   | \$13,000,000                | \$124,973,720   | \$178,712,420           |
| Alt. 5 – Rerouted Ethan Allen Service                   | Rutland  | Mechanicville, N. Bennington, and Manchester              | 5,7,8,9,10        | \$109,493,720            | \$2,480,000   | -                           | \$111,973,720   | \$160,122,420           |
| Alt. 6 – Split Shuttle Service                          | Rutland, Castleton, Fort Edward/Glens Falls, Saratoga Springs, Schenectady | Mechanicville, N. Bennington, and Manchester              | 1-5,7-10          | \$131,233,720            | \$2,894,000   | \$13,000,000                | \$147,127,720   | \$210,392,640           |

1 Assumes consist includes: one cabbage unit, one diesel locomotive and two single-level coaches

2 Assumes 30% contingency for overall construction (including incidentals) and 13% for professional services (survey, engineering, construction management and project administration).

3 Assumes construction of a caretaker-type station and layover/maintenance facility at the Manchester terminus.

**Table 9 - Cost Estimate by Alternative (Schenectady Routing)**

| Alternative   | Existing Stations to be Improved   | New Stations  | Corridor Segments | Rail Infrastructure Cost | Facility Cost | Equipment Cost <sup>1</sup> | Total Base Cost | Total Cost <sup>2</sup> |
|---|--|---|-------------------|--------------------------|---------------|-----------------------------|-----------------|-------------------------|
| Alt. 1 – No-Build                                       | No improvements  | No new stations.  | 1,2,3,4           | -                        | -             | -                           | -               | -                       |
| Alt. 2 – Loop Service                                   | Rutland, Castleton, Fort Edward/Glens Falls, Saratoga Springs, Schenectady | Mechanicville, N. Bennington, and Manchester              | 1-4,6-10          | \$92,257,400             | \$2,894,000   | \$13,000,000                | \$108,151,400   | \$154,656,502           |
| Alt. 3 – New Service to Manchester (Through Service)    | Schenectady  | Mechanicville, N. Bennington, and Manchester <sup>2</sup> | 1,2,6,7,8,9       | \$56,886,600             | \$4,354,500   | \$1,500,000                 | \$62,741,100    | \$89,719,773            |
| Alt. 3 – New Service to Manchester (Connecting Service) | Schenectady  | Mechanicville, N. Bennington, and Manchester <sup>2</sup> | 1,2,6,7,8,9       | \$56,886,600             | \$4,354,500   | \$13,000,000                | \$74,241,100    | \$106,164,773           |
| Alt. 4 – New Service to Rutland (Through Service)       | Rutland, Schenectady   | Mechanicville, N. Bennington, and Manchester              | 1,2,6-10          | \$77,732,400             | \$2,562,000   | -                           | \$80,294,400    | \$114,820,992           |
| Alt. 4 – New Service to Rutland (Connecting Service)    | Rutland, Schenectady   | Mechanicville, N. Bennington, and Manchester              | 1,2,6-10          | \$77,732,400             | \$2,562,000   | \$13,000,000                | \$93,294,400    | \$133,410,992           |
| Alt. 5 – Rerouted Ethan Allen Service                   | Rutland, Schenectady   | Mechanicville, N. Bennington, and Manchester              | 1,2,6-10          | \$77,732,400             | \$2,562,000   | -                           | \$80,294,400    | \$114,820,992           |
| Alt. 6 – Split Shuttle Service                          | Rutland, Castleton, Fort Edward/Glens Falls, Saratoga Springs, Schenectady | Mechanicville, N. Bennington, and Manchester              | 1-4,6-10          | \$92,257,400             | \$2,894,000   | \$13,000,000                | \$108,151,400   | \$154,656,502           |

1 Assumes consist includes: one cabbage unit, one diesel locomotive and two single-level coaches.

2 Assumes 30% contingency for overall construction (including incidentals) and 13% for professional services (survey, engineering, construction management and project administration).

3 Assumes construction of a caretaker-type station and layover/maintenance facility at the Manchester terminus.

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# A-2

## Attachment 2 - Operations

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### 2 Operations

Operating and maintenance costs are typically comprised of four major components:

- **Transportation** – The costs associated with the personnel directly involved in the movement of trains and the cost to move (operate) the trains. This cost includes the salaries of locomotive engineers and conductors, train dispatchers, and other operating personnel. Also included are the cost of Onboard Service personnel and the associated costs of providing food service, where applicable. These costs include provision for “Extra Board” staff to cover regular assignments due to vacations, training, illness, etc. and benefits accruing to the staff. Finally, this category includes provision for alternative transportation during times of heavy infrastructure maintenance or emergencies.
- **Mechanical** – The costs to maintain the equipment. This cost includes the daily cleaning and maintenance of the equipment and all major overhaul and repair work. Similar, to transportation needs, a reserve of equipment or “spare margin” is also included to provide equipment during times of routine maintenance, mechanical failures, wreck damage, etc.
- **Engineering** – The right-of-way and track maintenance costs. It includes labor and material costs for items such as tie renewal, ballast cleaning, rail replacement, grade crossing maintenance, etc.
- **Administrative** – The costs to administer the service and provide critical support services such as reservations systems, training and marketing programs.

In addition to these four categories, each service alternative considered will require the payment of an access fee to the host railroad(s). The access fee may be included in the engineering cost category. For the purposes of this analysis, it is assumed that the access fee charged by each host railroad is consistent among the host railroads in what it includes and the rate charged. A separate access fee will be assumed for each host railroad (i.e. if an alternative operates over three different railroads, three separate access fees will be assumed). Along with the

host railroad access fee Amtrak also provides performance incentive payments to host railroads based on specific criteria pertaining to on-time performance measurements.

It should be noted that Amtrak, the operator of the Adirondack and Ethan Allen services, has a more detailed cost model with additional breakdowns of the four major categories listed above. This initial screening of service alternatives will consider the four major categories of costs described above.

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## Existing Conditions

The existing Adirondack and Ethan Allen services are funded by NYSDOT and VTrans respectively and are operated by Amtrak. The No-Build and four of the five service alternatives assume that these two existing services continue to operate as they are structured today. Alternative 5 would reroute the Ethan Allen service via Mechanicville, North Bennington and Manchester to Rutland. The existing Adirondack service is structured to serve the New York City – Albany – Montreal corridor while the Ethan Allen service is structured to serve the New York City – Albany – Rutland corridor. The Ethan Allen generally operates with a locomotive and five coaches (four 78-seat coaches and one café car with 53 seats). It traverses three host railroads north of Albany – CSX, CP, and VRS. The total operating territory along the three host railroads is 100 miles (200 miles roundtrip). Since the existing Ethan Allen service structure is closest to the service alternatives being considered, it will serve as the basis of comparison for the service alternatives.

### Alternative 1 – No-Build

The No-Build Alternative assumes that the existing Adirondack and Ethan Allen Services continue to operate with their existing O&M cost structure and equipment consists. There are assumed to be no changes in the annual operating costs of the services (other than inflation).

### Alternative 2 – Loop Service

Alternative 2 proposes the operation of a new connecting loop service from Albany/Rensselaer to Rutland and back around to Albany/Rensselaer, serving all existing Ethan Allen stations plus three new stations in Manchester, North Bennington and Mechanicville.

Compared to the Existing Condition, Alternative 2 requires the following:

- One new set of equipment (1 locomotive, two coaches, 1 cabbage unit, and a spare equipment allowance;
- One additional crew (1 Engineer, 1 Conductor, 1 Assistant Conductor) and an

Extra Board allowance;

- 217/195 (Schenectady/CP Colonie routing) additional train miles;
- Service at three new stations (Manchester, North Bennington, and Mechanicville); and
- One additional host railroad (PAR).

### **Alternative 3 – New Service to Manchester**

Alternative 3 proposes the operation of a new service from Albany/Rensselaer to Manchester and back. Since Manchester does not currently have a facility to “turn” the train to orient the traditional “locomotive first” operation, a cab car or non-powered locomotive is necessary to provide push-pull service.

Compared to the Existing Condition, Alternative 3 (Connecting Service) requires the following:

- One new set of equipment (1 locomotive, two coaches, 1 cabbage unit, and a spare equipment allowance;
- One additional crew (1 Engineer, 1 Conductor, 1 Assistant Conductor) and an Extra Board allowance;
- A new layover facility in Manchester;
- Mechanical staff at Manchester to service trains at the new layover facility;
- 170/129 (Schenectady/CP Colonie routing) additional train miles;
- Service at three new stations (Manchester, North Bennington, Mechanicville); and
- One additional host railroad (PAR).

During the public review of the service alternatives, it was suggested that a through service would be preferred over a connecting service at Albany. Amtrak’s experience in the intercity market indicates a shuttle connection reduces total demand from 25 to 40 percent, depending upon the type of service. To operate a through service, an existing Empire Corridor train that currently terminates in Albany would be extended to Manchester. In order to extend this train, an additional crew would be required.

Compared to the Existing Condition, Alternative 3 (Through Service) requires the following:

- Since Manchester does not currently have a facility to “turn” the train to orient the traditional “locomotive first” operation, a cab car or non-powered locomotive is necessary to provide push-pull service; a cabbage unit is assumed for this analysis. Also, it may be necessary to increase the spare

equipment allowance;

- One additional crew (1 Engineer, 1 Conductor, 2 Assistant Conductors, 1 Lead Service Attendant) and an Extra Board allowance;
- 170/129 (Schenectady/CP Colonie routing) additional train miles;
- Service at three new stations (Manchester, North Bennington, and Mechanicville); and
- One additional host railroad (PAR).

#### **Alternative 4 –New Service to Rutland**

Alternative 4 proposes the operation of a new service from Albany/Rensselaer to Rutland and back, serving the existing Schenectady and Rutland stations plus three new stations in Manchester, North Bennington and Mechanicville.

Compared to the Existing Condition, Alternative 4 (Connecting Service) requires the following:

- One new set of equipment (1 locomotive, two coaches, 1 cabbage unit, and a spare equipment allowance;
- One additional crew (1 Engineer, 1 Conductor, 1 Assistant Conductor) and an Extra Board allowance;
- 234/191 (Schenectady/CP Colonie routing) additional train miles;
- Service at three new stations (Manchester, North Bennington, and Mechanicville); and
- One additional host railroad (PAR).

During the public review of the service alternatives, it was suggested that a through service would be preferred over a connecting service at Albany. Amtrak's experience in the intercity market indicates a shuttle connection reduces total demand from 25 - 40%, depending upon the type of service. To operate a through service, an existing Empire Corridor train that currently terminates in Albany would be extended to Rutland. In order to extend this train, an additional crew would be required. No additional equipment would be required.

Compared to the Existing Condition, Alternative 4 (through Service) requires the following:

- No additional equipment is required to operate the service as an existing Empire Corridor set is being utilized. It may be necessary to increase the spare equipment allowance;
- One additional crew (1 Engineer, 1 Conductor, 2 Assistant Conductors, 1 Lead

Service Attendant) and an Extra Board allowance;

- 234/191 (Schenectady/CP Colonie routing) additional train miles;
- Service at three new stations (Manchester, North Bennington, and Mechanicville); and
- One additional host railroad (PAR).

### **Alternative 5 – Rerouted Ethan Allen Service**

Alternative 5 would reroute the existing Ethan Allen service. The rerouted service would travel via Mechanicville to Rutland and back. It would service two existing stations in Schenectady and Rutland plus three new stations in Manchester, North Bennington and Mechanicville. The service is assumed to be provided by the existing five coach consist (four standard coaches and one café car seats) hauled by a diesel locomotive. This service will operate over four host railroads (CSX, CP, VRS (VTR) and PAR) north of Albany for a total of 234 miles.

Compared to the Existing Condition, Alternative 5 requires the following:

- No new equipment (existing Ethan Allen equipment used);
- No additional crew (existing Ethan Allen crew used);
- 34/(-9) (Schenectady/CP Colonie routing) additional train miles;
- Service at three new stations (Manchester, North Bennington, and Mechanicville); and
- One additional host railroad (PAR).

### **Alternative 6 – Split Shuttle Service**

Alternative 6 proposes the operation of a new “split” shuttle service from Albany/Rensselaer to Rutland and back via two routes. One route would follow the existing Ethan Allen service corridor while the second route would be via Mechanicville, North Bennington and Manchester to Rutland. The split shuttle would service all existing Ethan Allen stations plus three new stations in Manchester, North Bennington and Mechanicville. Since Albany does not currently have a facility to “turn” the train to orient the traditional “locomotive first” operation, a cab car or non-powered locomotive is necessary to provide push-pull service.

Compared to the Existing Condition, Alternative 6 requires the following:

- Two new sets of equipment (1 locomotive, two coaches, and 1 cabbage unit in each set) and spare equipment allowances;
- Two additional crews (1 Engineer, 1 Conductor, 1 Assistant Conductor in each crew) and an Extra Board allowance;

- 434/391 (Schenectady/CP Colonie routing) additional train miles;
- Service at three new stations (Manchester, North Bennington, and Mechanicville); and
- One additional host railroad (PAR).

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## Assessment of O&M Costs

A summary of operating assumptions is documented in Table 1. For the purposes of the Phase One Screening, order of magnitude O&M costs for each alternative were calculated based on the existing operating cost for the Ethan Allen service. The fully-allocated cost for operating the Ethan Allen service during Fiscal Year 2010-11 was used to estimate an average per-mile operating cost. This per-mile cost was then applied to the proposed service alternatives to calculate estimated O&M costs for each, based on the additional train miles for each alternative. Tables 2 and 3 show the estimated O&M cost for both routings to connect Mechanicville, New York to Albany/Rensselaer, New York and the relative cost impact, by alternative.

Major points to be noted about the O&M cost estimates:

- Of the Build Alternatives, Alternative 6 has the highest additional O&M costs:
  - Two new crews are required;
  - It has the highest new train mileage; and
  - While Alternative 6 requires two sets of equipment (two two-car sets), the equipment requirements are similar to existing conditions (one five car set).
- Of the Build Alternatives, Alternative 5 has the lowest additional O&M costs since rerouting the existing Ethan Allen service results in an increment of 34/(-9) (Schenectady/CP Colonie routing) train miles.
- For Alternative 3, the operating cost would be slightly higher than the amount indicated in Table 2 and 3 as a mechanical crew would be needed to staff the Manchester Layover facility.
- For Alternatives 3 and 4:
  - The difference in operating cost of through versus connecting service is anticipated to be minimal; and
  - The capital equipment cost is higher for the connecting service considering the requirement for one new set – one locomotive and two coaches - to operate the proposed service.

Table 1 - Operations Summary

| Service Parameters      | Alternative 1 –<br>No-Build<br>(Ethan Allen stats)                | Alternative 2 –<br>Loop Service | Alternative 3 –<br>Service to Manchester |            | Alternative 4 –<br>Service to Rutland |            | Alternative 5 –<br>Rerouted Ethan<br>Allen Service | Alternative 6 –<br>Split Shuttle<br>Service |
|-------------------------|---|---------------------------------|--|------------|---------------------------------------|------------|--|---|
| Service                 | Through   | Connecting                      | Through                                  | Connecting | Through                               | Connecting | Through  | Connecting                                  |
| New Consists            | -   | 1                               | -  | 1          | -                                     | 1          | -  | 2   |
| <i>Locomotives</i>      | -   | 1                               | -  | 1          | -                                     | 1          | -  | 2   |
| <i>Coaches</i>          | -   | 2                               | -  | 2          | -                                     | 2          | -  | 4   |
| Host Railroads          | -   | 4                               | 4  | 4          | 4                                     | 4          | 1  | 4   |
| New Op Crews            | -   | 1                               | 1  | 1          | 1                                     | 1          | -  | 2   |
| New Mechanical<br>Crews | -   | -                               | 1  | 1          | -                                     | -          | -  | -   |
| New Stations            | -   | 3                               | 3  | 3          | 3                                     | 3          | 3  | 3   |
| O&M Cost Impact         | None  | Moderate                        | Moderate                                 | Moderate   | Moderate                              | Moderate   | Low  | High  |
| Notes                   | Maintains existing Ethan Allen (EA) and Adirondack (ADK) service. |                                 |  |            |                                       |            | Reroutes existing<br>EA service                    | Maintains<br>existing EA and<br>ADK service |

**Table 2 - Estimated Net Change in O&M Cost (CP Colonie Routing)**

| Alternative                         | 1        | 2           | 3           | 4           | 5           | 6           |
|-------------------------------------|----------|-------------|-------------|-------------|-------------|-------------|
| From                                | Rutland  | Rutland     | Manchester  | Rutland     | Rutland     | Rutland     |
| To                                  | Albany   | Rutland     | Albany      | Albany      | Albany      | Albany      |
| No. of Daily Roundtrips             | 0        | 1           | 1           | 1           | 1           | 2           |
| Daily Roundtrip Miles               | 0        | 195         | 129         | 191         | -9          | 391         |
| Days of Operation                   | 0        | 365         | 365         | 365         | 365         | 365         |
| Annual Miles                        | 0        | 71,175      | 47,085      | 69,715      | (3,285)     | 142,715     |
| Fully Allocated Unit Operating Cost | \$ 66.01 | \$ 66.01    | \$ 66.01    | \$ 66.01    | \$ 66.01    | \$ 66.01    |
| Annual Operating Cost               | \$ 0     | \$4,698,220 | \$3,108,053 | \$4,601,847 | \$(216,841) | \$9,420,534 |

**Table 3 - Estimated Net Change in O&M Cost (Schenectady Routing)**

| Alternative                         | 1        | 2            | 3            | 4            | 5          | 6             |
|-------------------------------------|----------|--------------|--------------|--------------|------------|---------------|
| From                                | Rutland  | Rutland      | Manchester   | Rutland      | Rutland    | Rutland       |
| To                                  | Albany   | Rutland      | Albany       | Albany       | Albany     | Albany        |
| No. of Daily Roundtrips             | 0        | 1            | 1            | 1            | 1          | 2             |
| Daily Roundtrip Miles               | 0        | 217          | 170          | 234          | 34         | 434           |
| Days of Operation                   | 0        | 365          | 365          | 365          | 365        | 365           |
| Annual Miles                        | 0        | 79,205       | 62,050       | 85,410       | 12,410     | 158,410       |
| Fully Allocated Unit Operating Cost | \$ 66.01 | \$ 66.01     | \$ 66.01     | \$ 66.01     | \$ 66.01   | \$ 66.01      |
| Annual Operating Cost               | \$ 0     | \$ 5,228,276 | \$ 4,095,884 | \$ 5,637,864 | \$ 819,177 | \$ 10,456,552 |



# A-3

## Attachment 3 – Environmental Impact Summary Table

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### 3 Environmental Impact Summary Table

Table 1 - Summary of Anticipated Environmental Impacts

|           | Noise and Vibration Impacts  | Rare, Threatened and Endangered (RTE) Species/Habitats   | Water Resources  | Floodplain and Wetland Impacts  | Environmental Justice  | Socioeconomic Impacts and Land Use  | Cultural/Historic Section 4(f) and Recreational Section 4(f) and 6(f) Impacts   |
|-----------|--|--|--|---|--|---|---|
| Segment 1 | <p><b>Noise:</b> Future noise levels may increase up to 3dba. Potential moderate noise impacts near at-grade crossing up to 139 ft from near track. For new special trackwork – potential moderate noise impacts up 200'/300' (jointed rail/ continuous welded rail (CWR)) and potential severe impacts 46'/200'.</p> <p><b>Vibration:</b> Distance from near track to potential vibration impact:<br/>Special Trackwork – 200'/183' (land use category 2/3).</p>                      | Potential impacts to RTE species or habitat is expected to be minimal.   | The potential for impacts to surface water or groundwater resources along Segment 1 is expected to be minimal.   | <p><b>Floodplains:</b> Floodplains crossed by or adjacent to Segments 1 through 4 are unlikely to be impacted by the Project unless work extends outside of the existing rail ROW or surface water crossings are modified in such as way as to change the hydraulic opening.</p> <p><b>Wetlands:</b> Wetlands extending into or adjacent to Segments 1 through 4 are unlikely to be impacted by the Project unless work extends outside of the existing rail ROW or surface water crossings are modified in such as way as to change the hydraulic opening.</p> | Seven census tracts along Segment 1 qualify as EJ populations. No properties would be acquired in this segment, so EJ communities would not be displaced nor would community cohesion be affected. | Socioeconomic Impacts: No significant and adverse direct, indirect, or cumulative effects to socioeconomic conditions are expected to result from the Project. Constructing a new wye in Mechanicville and reconstructing a wye in Albany on Segment 5 may lead to direct changes to land use, and direct, though likely not significant, effects associated with land acquisition and community cohesion. It is anticipated that the scale or types of properties acquired or businesses potentially relocated would not amount to a significant impact to socioeconomic conditions.   | <p><b>Cultural:</b> 2 above-ground resources within 100' (50' from centerline) of the rail corridor. No anticipated adverse effects.</p> <p><b>Recreational:</b> 5 properties identified; no direct or constructive use impacts anticipated.</p>  |
| Segment 2 | <p><b>Noise:</b> Future noise levels may increase up to 3dba. Potential moderate noise impacts near at-grade crossing up to 191 ft from near track. For new special trackwork – potential moderate noise impacts up 200'/300' (jointed rail/CWR) and potential severe impacts 55'/200'.</p> <p><b>Vibration:</b> Distance from near track to potential vibration impact:<br/>Special Trackwork – 157'/110' (land use category 2/3).</p>  | Potential impacts to RTE species or habitat is expected to be minimal.   | The potential for impacts to groundwater resources along Segment 2 is expected to be minimal. Upgrading crossings to accommodate a new siding may impact surface water resources.                    | <p><b>Floodplains:</b> Floodplains crossed by or adjacent to Segments 1 through 4 are unlikely to be impacted by the Project unless work extends outside of the existing rail ROW or surface water crossings are modified in such as way as to change the hydraulic opening.</p> <p><b>Wetlands:</b> Wetlands extending into or adjacent to Segments 1 through 4 are unlikely to be impacted by the Project unless work extends outside of the existing rail ROW or surface water crossings are modified in such as way as to change the hydraulic opening.</p> | Two census tracts along Segment 2 qualify as EJ populations. No properties would be acquired in this segment, so EJ communities would not be displaced nor would community cohesion be affected.   | Given the likely availability of potentially suitable land that may be developed adjacent to the ROW for the proposed new station parking areas, it is unlikely that parking lots would replace residences or businesses. Direct effects to socioeconomic conditions as a result of land use changes related to new stations are considered unlikely.   | <p><b>Cultural:</b> 1 above-ground resource within 100' of the rail corridor. No anticipated adverse effects.</p> <p><b>Recreational:</b> No properties identified adjacent to rail line in Segment 2.</p>  |
| Segment 3 | <p><b>Noise:</b> Future noise levels may increase up to 2dba. Potential moderate noise impacts near at-grade crossing up to 138 ft from near track and potential severe impacts up to 29'. For new special trackwork – potential moderate noise impacts up 88'/200' (jointed rail/CWR) and potential severe impacts up to 50' for CWR.</p> <p><b>Vibration:</b> Distance from near track to potential vibration impact:<br/>Special Trackwork – 172'/120' (land use category 2/3).</p> | Potential impacts to RTE species or habitat is expected to be minimal.   | The potential for impacts to groundwater resources along Segment 3 is expected to be minimal. Upgrading crossings to accommodate a new siding and mainline track may impact surface water resources. | <p><b>Floodplains:</b> Floodplains crossed by or adjacent to Segments 1 through 4 are unlikely to be impacted by the Project unless work extends outside of the existing rail ROW or surface water crossings are modified in such as way as to change the hydraulic opening.</p> <p><b>Wetlands:</b> Wetlands extending into or adjacent to Segments 1 through 4 are unlikely to be impacted by the Project unless work extends outside of the existing rail ROW or surface water crossings are modified in such as way as to change the hydraulic opening.</p> | No EJ communities adjacent to Segment 3.   | On a regional level, the Project would be expected to support regional planning initiatives, particularly the clearly defined goals outlined by the Rutland Regional Planning Commission with regard to enhancement of rail service throughout the region as a means of supporting economic development.  | <p><b>Cultural:</b> 2 above-ground resources within 100' of the rail corridor. No anticipated adverse effects. High archaeological sensitivity between Fort Edward and Whitehall, where Champlain Canal and early barge canal parallel rail corridor.</p> <p><b>Recreational:</b> 5 properties identified; no direct or constructive use impacts anticipated.</p> |
| Segment 4 | <p><b>Noise:</b> Future noise levels may increase up to 2dba. Potential moderate noise impacts near at-grade crossing up to 443 ft from near track and potential severe impacts up to 37'. For new special trackwork – potential moderate to severe noise impacts up 148'/39' (jointed rail/CWR).</p> <p><b>Vibration:</b> Distance from near track to potential vibration impact:<br/>Mainline – 94'/66' (land use category 2/3)<br/>Special Trackwork – 200'/183'</p>                | RTE species or habitat in Segment 4 may be impacted because the element occurrences (Eos) are close to the rail ROW. | The potential for impacts to surface water or groundwater resources along Segment 4 is expected to be minimal.   | <p><b>Floodplains:</b> Floodplains crossed by or adjacent to Segments 1 through 4 are unlikely to be impacted by the Project unless work extends outside of the existing rail ROW or surface water crossings are modified in such as way as to change the hydraulic opening.</p> <p><b>Wetlands:</b> Wetlands extending into or adjacent to Segments 1 through 4 are unlikely to be impacted by the Project unless work extends outside of the existing rail ROW or surface water crossings are modified in such as way as to change the hydraulic opening.</p> | No EJ communities adjacent to Segment 4.   | Only along Segment 5, with the proposed new wye in Mechanicville and grade separated crossing at the reconstructed wye in Albany, have project-related activities extending beyond the existing ROW been identified. Since Segment 5 is common to all Service Alternatives, there is no difference between the alternatives in the potential for impacts to land use from infrastructure improvements. There is potential for direct land use impacts associated with the development of parking lots to support the three proposed new stations in Mechanicville, NY North Bennington, VT and Manchester, VT. Each of these stations is also common to all Service Alternatives, and therefore there is no difference between the alternatives in the potential for impacts to land use from the stations. | <p><b>Cultural:</b> 3 above-ground resources within 100' of the rail corridor. No anticipated adverse effects.</p> <p><b>Recreational:</b> 3 properties identified; no direct or constructive use impacts anticipated.</p>  |



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|           | Noise and Vibration Impacts   | Rare, Threatened and Endangered (RTE) Species/Habitats                        | Water Resources   | Floodplain and Wetland Impacts   | Environmental Justice   | Socioeconomic Impacts and Land Use | Cultural/Historic Section 4(f) and Recreational Section 4(f) and 6(f) Impacts  |
|-----------|---|---|---|--|---|------------------------------------|--|
| Segment 5 | <p><b>Noise:</b> Future noise levels may increase up to 5dba. Potential moderate noise impacts along mainline up to 188'/549' (jointed rail/CWR) along mainline, and potential severe noise impacts 23'/58'. Potential moderate noise impacts near at-grade crossing up to 313 ft from near track and potential severe impacts up to 49'.</p> <p>For new special trackwork – potential moderate noise impacts up 300'/549' and potential severe impacts 177'/200'.</p> <p>Potential for moderate noise impacts up to 750' and severe noise impacts up to 350' from the new wye connection in Mechanicville. No noise impacts are expected near the proposed wye connection in Albany.</p> <p><b>Vibration:</b> Distance from near track to potential vibration impact:<br/>Mainline – 86'/60' (land use category 2/3)<br/>Special Trackwork – 172'/120'</p> | <p>Potential impacts to RTE species or habitat is expected to be minimal.</p> | <p>The potential for impacts to groundwater resources along Segment 5 is expected to be minimal. A new bridge over the Anthony Kill would be built for the new wye connection in Mechanicville, and may impact the Anthony Kill. Upgrades to existing crossings and new crossing construction may impact surface water resources.</p> | <p><b>Floodplains:</b> The proposed new crossing over the Anthony Kill and its floodplain may impact these resources. Other floodplains crossed by or adjacent to Segment 5 are unlikely to be impacted by the Project unless work extends outside of the existing rail ROW.</p> <p><b>Wetlands:</b> The planned crossing over the Anthony Kill may impact wetlands. Other wetlands extending into or adjacent to Segment 5 are unlikely to be impacted by the Project unless work extends outside of the existing rail ROW.</p> | <p>Three census tracts along Segment 5 qualify as EJ populations. It is anticipated that the scale or types of properties acquired or businesses relocated to accommodate the grade separated crossing in Albany would not amount to a significant impact to socioeconomic conditions; therefore, EJ communities in Segment 5 would likely not bear direct effects.</p> |                                    | <p><b>Cultural:</b> 6 above-ground resources within 100' of the rail corridor. Reconstructed wye connection in Albany may be considered an adverse effect to the two nearby properties that may be eligible for listing. High archaeological sensitivity along entire route due to close proximity of Hudson River, Erie Canal, and Champlain Canal.</p> <p><b>Recreational:</b> 2 properties identified; no direct or constructive use impacts anticipated.</p> |
| Segment 6 | <p><b>Noise:</b> Future noise levels may increase up to 2dba. Potential moderate noise impacts near at-grade crossing up to 139 ft from near track and potential severe impacts up to 30'.</p> <p>For new special trackwork – potential moderate noise impacts up 59'/200' (jointed rail/CWR) and potential severe impacts up to 35' for CWR.</p> <p><b>Vibration:</b> Distance from near track to potential vibration impact:<br/>Mainline – 86'/60' (land use category 2/3)<br/>Special Trackwork – 172'/120'</p>   | <p>Potential impacts to RTE species or habitat is expected to be minimal.</p> | <p>The potential for impacts to groundwater resources along Segment 6 is expected to be minimal. Upgrading crossings to accommodate a new siding may impact surface water resources.</p>  | <p><b>Floodplains:</b> Floodplains crossed by or adjacent to Segments 6 through 10 are unlikely to be impacted by the Project unless work extends outside of the existing rail ROW or surface water crossings are modified in such as way as to change the hydraulic opening.</p>  | <p>No EJ communities adjacent to Segment 6.</p>   |                                    | <p><b>Cultural:</b> No above-ground resources within 100' of the rail corridor. Potential sites near Anthony Kill, otherwise generally low archaeological sensitivity.</p> <p><b>Recreational:</b> No properties identified adjacent to rail line in Segment 6.</p>  |
| Segment 7 | <p><b>Noise:</b> Future noise levels may increase up to 2dba. Potential moderate noise impacts near at-grade crossing up to 139 ft from near track and potential severe impacts up to 29'.</p> <p>A new passenger rail station in Mechanicville would have the potential for moderate noise impacts up to 29' for CWR.</p> <p>For new special trackwork – potential moderate noise impacts up 110'/200' (jointed rail/CWR) and potential severe impacts up to 23'/61'.</p> <p><b>Vibration:</b> Distance from near track to potential vibration impact:<br/>Special Trackwork – 157'/110' (land use category 2/3)</p>   | <p>Potential impacts to RTE species or habitat is expected to be minimal.</p> | <p>The potential for impacts to groundwater resources along Segment 7 is expected to be minimal; upgrading the crossings to accommodate the track may impact surface water resources.</p>   | <p><b>Wetlands:</b> Wetlands extending into or adjacent to Segments 6- 10 are unlikely to be impacted by the Project unless work extends outside of the existing rail ROW or surface water crossings are modified in such as way as to change the hydraulic opening.</p>   | <p>No EJ communities adjacent to Segment 7.</p>   |                                    | <p><b>Cultural:</b> 2 above-ground resources within 100' of the rail corridor. No anticipated adverse effects.</p> <p><b>Recreational:</b> No properties identified adjacent to rail line in Segment 7.</p>  |



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|                   | Noise and Vibration Impacts  | Rare, Threatened and Endangered (RTE) Species/Habitats  | Water Resources   | Floodplain and Wetland Impacts | Environmental Justice                     | Socioeconomic Impacts and Land Use | Cultural/Historic Section 4(f) and Recreational Section 4(f) and 6(f) Impacts   |
|-------------------|--|---|---|--------------------------------|---|------------------------------------|---|
| <b>Segment 8</b>  | <p><u>Noise:</u> Future noise levels may increase up to 6dba. Potential moderate noise impacts along mainline up to 100'/147' (jointed rail/CWR) along mainline and potential severe noise impacts up to 26' for CWR. Potential moderate noise impacts near at-grade crossing up to 905' ft from near track and potential severe impacts up to 207'.</p> <p>A new passenger rail station in North Bennington would have the potential for moderate noise impacts up to 209'/257' and potential severe impacts up to 49'/64'.</p> <p>For new special trackwork – potential moderate noise impacts up to 200' for either jointed rail or CWR and potential severe impacts up to 49'/64'.</p> <p><u>Vibration:</u> Distance from near track to potential vibration impact:<br/>Mainline – 86'/60' (land use category 2/3)<br/>New Station – 20'/29'</p> | Potential impacts to RTE species or habitat is expected to be minimal.  | The potential for impacts to groundwater resources along Segment 8 is expected to be minimal. Upgrading the crossings to accommodate the infrastructure improvements and reconstructing bridges may impact surface water resources. |                                | No EJ communities adjacent to Segment 8.  |                                    | <p><u>Cultural:</u> 2 above-ground resources within 100' of the rail corridor. No anticipated adverse effects. High archaeological sensitivity along most of corridor due to close proximity of the Walloomsac River and Bennington Battlefield.</p> <p><u>Recreational:</u> No properties identified adjacent to rail line in Segment 8.</p> |
| <b>Segment 9</b>  | <p><u>Noise:</u> Same potential impacts as Segment 8.</p> <p><u>Vibration:</u> Same potential impacts as Segment 8.</p>  | RTE species in Segment 9 may be impacted because the EOs are close to the rail ROW. Increased train traffic or track improvements could impact bear movement and result in habitat fragmentation; the impacts are expected to be minimal because this segment is an active rail corridor.           | The potential for impacts to groundwater resources along Segment 9 is expected to be minimal. Upgrading the crossings to accommodate new infrastructure and reconstructing bridges may impact surface water resources.              |                                | No EJ communities adjacent to Segment 9.  |                                    | <p><u>Cultural:</u> 4 above-ground resources within 100' of the rail corridor. No anticipated adverse effects.</p> <p><u>Recreational:</u> 4 properties identified; no direct or constructive use impacts anticipated.</p>  |
| <b>Segment 10</b> | <p><u>Noise:</u> Same potential impacts as Segment 8, except there will be no new Station in this segment.</p> <p><u>Vibration:</u> Same potential impacts as Segment 8, except with no new Station in this segment.</p>   | RTE species in Segment 10 may be impacted because the EOs are close to the rail ROW. Increased train traffic or track improvements could impact deer and bear movement and result in habitat fragmentation; the impacts are expected to be minimal because this segment is an active rail corridor. | The potential for impacts to groundwater resources along Segment 10 is expected to be minimal. Upgrading crossings to accommodate new track may impact surface water resources.   |                                | No EJ communities adjacent to Segment 10. |                                    | <p><u>Cultural:</u> 2 above-ground resources within 100' of the rail corridor. No anticipated adverse effects. High archaeological sensitivity along Otter Creek, with several known sites.</p> <p><u>Recreational:</u> 11 properties identified; no direct or constructive use impacts anticipated.</p>                                      |



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# A-4

## Attachment 4 – Evaluation Summary Tables

### 4 Evaluation Summary Tables

Tables 1 through 6 present a summary of the evaluation rankings for each alternative including a brief justification describing why each alternative received a particular ranking. Each alternative has been assigned a “Positive” (●), “Negative” (○) or “Neutral” (◐) impact for each criteria using the symbols indicated.

**Table 1 - Alternative One (No-Build)**

| Category                    | Criterion  | Score | Justification  |
|-----------------------------|--|-------|--|
| Rail Access and Mobility    | Would the proposed alternative improve regional mobility and rail access to key destinations within the project study area?                      | ○     | Currently unserved areas would remain unserved.  |
|                             | Would the proposed alternative lead to travel time savings for potential passengers, as compared to existing travel modes (i.e. rail, car, bus)? | ○     | Travel times would likely increase with increases in traffic volumes and congestion.   |
|                             | Would the proposed alternative provide a frequency of service and/or routing that would make it an attractive transportation option?             | ○     | <ul style="list-style-type: none"> <li>Existing deficiencies in coverage would remain.</li> <li>Based on Phase One analyses, the No-Build alternative exhibits the lowest anticipated increase in annual ridership.</li> </ul> |
| Transportation Efficiencies | Does the proposed alternative provide viable and useful intermodal connections?  | ○     | Currently unserved areas would remain unserved.  |
|                             | Is the proposed alternative generally cost efficient in terms of order of magnitude costs?   | ●     | No additional capital or O&M costs would be required.  |
|                             | Does the proposed alternative maximize use of the existing infrastructure?   | ◐     | Alternative assumes no capital improvements beyond those already committed.  |
|                             | Does the proposed alternative minimize impacts on existing freight and passenger rail operations (post implementation)?                          | ◐     | No additional impacts (positive or negative) to existing freight services or passenger rail services.  |
|                             | Can the supporting infrastructure be built with  | ◐     | No capital improvements necessary to   |

|  |   |                                  |  |
|--|---|----------------------------------|--|
|  | minimum impact on the operations of existing freight and passenger rail services during construction? |                                  | implement this alternative.  |
| <b>Economic/<br/>Sustainable<br/>Development</b> | Would the alternative support or promote opportunities for Smart Growth & Economic Development?       | <input type="radio"/>            | Due to the remaining deficiencies in coverage, economic opportunities in the region would likely continue to be limited. |
| <b>Environmental<br/>Quality</b>                 | Does the proposed alternative minimize potential environmental impacts?                               | <input checked="" type="radio"/> | No significant environmental impacts are anticipated.  |
|  | Does the proposed alternative result in any potentially positive environmental impacts?               | <input checked="" type="radio"/> | No significant environmental impacts (including benefits) are anticipated.   |

**Table 2 - Alternative Two (Loop Service)**

| Category                           | Criterion   | Score | Justification  |
|------------------------------------|---|-------|--|
| <b>Rail Access and Mobility</b>    | Would the proposed alternative improve regional mobility and rail access to key destinations within the project study area?                           | ●     | Alternative would provide improved access to rail; however mobility would be hindered by loop routing.   |
|                                    | Would the proposed alternative lead to travel time savings for potential passengers, as compared to existing travel modes (i.e. rail, car, bus)?      | ○     | Loop routing would make the round trip inefficient and make travel time savings unlikely.  |
|                                    | Would the proposed alternative provide a frequency of service and/or routing that would make it an attractive transportation option?                  | ○     | <ul style="list-style-type: none"> <li>Given the wide coverage area, this alternative is projected to have good potential for ridership capture; however the loop routing would make some connections inefficient.</li> <li></li> </ul>  |
| <b>Transportation Efficiencies</b> | Does the proposed alternative provide viable and useful intermodal connections?   | ●     | Provides connections to cities and major attractions within the study area; however, the loop routing may make the service less attractive for providing useful connections.   |
|                                    | Is the proposed alternative generally cost efficient in terms of order of magnitude costs?  | ○     | <ul style="list-style-type: none"> <li>Based on the Phase One cost estimates, this alternative is anticipated to be one of the most expensive to implement.</li> <li>This alternative is anticipated to have moderate operating costs compared to other alternatives.</li> </ul> |
|                                    | Does the proposed alternative maximize use of the existing infrastructure?  | ●     | <ul style="list-style-type: none"> <li>Alternative can be implemented using established, active rail lines.</li> <li>New connections can be established on existing track (in Vermont) with the capacity to support passenger rail.</li> </ul>                                   |
|                                    | Does the proposed alternative minimize impacts on existing freight and passenger rail operations (post implementation)?                               | ○     | Additional passenger service on the New York side of the study area could lead to capacity issues depending on projected future freight traffic.   |
|                                    | Can the supporting infrastructure be built with minimum impact on the operations of existing freight and passenger rail services during construction? | ●     | Capital improvements to support the proposed service can be constructed with minimal impact to existing operations.  |

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| Category   | Criterion   | Score | Justification   |
|--|---|-------|---|
| <b>Economic/<br/>Sustainable<br/>Development</b> | Would the alternative support or promote opportunities for Smart Growth & Economic Development? | ○     | Alternative provides improved rail connections throughout the study area; however, the loop routing may be unattractive to choice riders and would likely limit economic development opportunities. |
| <b>Environmental<br/>Quality</b>                 | Does the proposed alternative minimize potential environmental impacts?                         | ●     | Desktop review revealed no significant environmental impacts (or benefits) that would differentiate one build alternative from the others.  |
|  | Does the proposed alternative result in any potentially positive environmental impacts?         | ●     |   |

**Table 3 - Alternative Three (New Service to Manchester)**

| Category                    | Criterion   | Score | Justification   |
|-----------------------------|---|-------|---|
| Rail Access and Mobility    | Would the proposed alternative improve regional mobility and rail access to key destinations within the project study area?                           | ○     | <ul style="list-style-type: none"> <li>Improved rail access to Albany/ Rensselaer from southwest Vermont</li> <li>Lacks connection b/w Rutland and Manchester.</li> </ul>   |
|                             | Would the proposed alternative lead to travel time savings for potential passengers, as compared to existing travel modes (i.e. rail, car, bus)?      | ○     | <ul style="list-style-type: none"> <li>Potential travel time savings due to new connections.</li> <li>No time savings for trips to Rutland from other Vermont stations.</li> </ul>  |
|                             | Would the proposed alternative provide a frequency of service and/or routing that would make it an attractive transportation option?                  | ○     | <ul style="list-style-type: none"> <li>More attractive for travelers to/from Vermont, but limited due to lack of connection from Rutland to Manchester.</li> <li>Based on the Phase One analyses, this alternative is projected to produce the second lowest increase in annual ridership.</li> </ul> |
| Transportation Efficiencies | Does the proposed alternative provide viable and useful intermodal connections?   | ○     | <ul style="list-style-type: none"> <li>Provides connections to cities and major attractions within the study area.</li> <li>No direct connection b/w Manchester and Rutland.</li> </ul>   |
|                             | Is the proposed alternative generally cost efficient in terms of order of magnitude costs?  | ●     | <ul style="list-style-type: none"> <li>Based on the Phase One cost estimates, this alternative is anticipated to be the least expensive to implement.</li> <li>This alternative is anticipated to have moderate operating costs compared to other alternatives.</li> </ul>                            |
|                             | Does the proposed alternative maximize use of the existing infrastructure?  | ●     | <ul style="list-style-type: none"> <li>Alternative can be implemented using established, active rail lines.</li> <li>New connections can be established on existing track (in Vermont) with the capacity to support passenger rail.</li> </ul>  |
|                             | Does the proposed alternative minimize impacts on existing freight and passenger rail operations (post implementation)?                               | ●     | Alternative proposes adding service on the Vermont side of the study area where there is capacity for additional service.   |
|                             | Can the supporting infrastructure be built with minimum impact on the operations of existing freight and passenger rail services during construction? | ○     | Capital improvements to support the proposed service can be constructed with minimal impact to existing operations.   |

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| Category   | Criterion   | Score | Justification  |
|--|---|-------|--|
| <b>Economic/<br/>Sustainable<br/>Development</b> | Would the alternative support or promote opportunities for Smart Growth & Economic Development? | ●     | Alternative provides improved rail connections to southwest Vermont; however, the lack of a direct link between Manchester and Rutland will likely limit economic development opportunities. |
| <b>Environmental<br/>Quality</b>                 | Does the proposed alternative minimize potential environmental impacts?                         | ●     | Desktop review revealed no significant environmental impacts (or benefits) that would differentiate one build alternative from the others.   |
|  | Does the proposed alternative result in any potentially positive environmental impacts?         | ●     |  |

Table 4 - Alternative Four (New Service to Rutland)

| Category                          | Criterion   | Score | Justification   |
|-----------------------------------|---|-------|---|
| Rail Access and Mobility          | Would the proposed alternative improve regional mobility and rail access to key destinations within the project study area?                           | ●     | <ul style="list-style-type: none"> <li>Improved rail access to Albany/Rensselaer from southwest Vermont</li> <li>Provides rail link b/w Manchester and Rutland.</li> </ul>  |
|                                   | Would the proposed alternative lead to travel time savings for potential passengers, as compared to existing travel modes (i.e. rail, car, bus)?      | ●     | Potential travel time savings due to new connections.   |
|                                   | Would the proposed alternative provide a frequency of service and/or routing that would make it an attractive transportation option?                  | ●     | <ul style="list-style-type: none"> <li>More attractive for travelers to/from Vermont.</li> <li>Based on the Phase One analyses, this alternative is projected to produce the highest increase in annual ridership.</li> </ul>   |
| Transportation Efficiencies       | Does the proposed alternative provide viable and useful intermodal connections?   | ●     | Provides connections to cities and major attractions within the study area.   |
|                                   | Is the proposed alternative generally cost efficient in terms of order of magnitude costs?  | ●     | <ul style="list-style-type: none"> <li>Based on the Phase One capital cost estimates, this alternative is anticipated to require moderate capital investment to implement.</li> <li>This alternative is anticipated to have moderate operating costs compared to other alternatives.</li> </ul> |
|                                   | Does the proposed alternative maximize use of the existing infrastructure?  | ●     | <ul style="list-style-type: none"> <li>Alternative can be implemented using established, active rail lines.</li> <li>New connections can be established on existing track (in Vermont) with the capacity to support passenger rail.</li> </ul>  |
|                                   | Does the proposed alternative minimize impacts on existing freight and passenger rail operations (post implementation)?                               | ●     | Alternative proposes adding service on the Vermont side of the study area where there is capacity for additional service.   |
|                                   | Can the supporting infrastructure be built with minimum impact on the operations of existing freight and passenger rail services during construction? | ●     | Capital improvements to support the proposed service can be constructed with minimal impact to existing operations.   |
| Economic/ Sustainable Development | Would the alternative support or promote opportunities for Smart Growth & Economic Development?   | ●     | Due to improved rail connections within the study area and to the region, this alternative has good potential to support economic development opportunities.  |

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| Category                         | Criterion   | Score | Justification  |
|----------------------------------|---|-------|--|
| <b>Environmental<br/>Quality</b> | Does the proposed alternative minimize potential environmental impacts?                 | ●     | Desktop review revealed no significant environmental impacts (or benefits) that would differentiate one build alternative from the others. |
|                                  | Does the proposed alternative result in any potentially positive environmental impacts? | ●     |  |

**Table 5 - Alternative Five (Rerouted Ethan Allen Service)**

| Category                           | Criterion   | Score | Justification   |
|------------------------------------|---|-------|---|
| <b>Rail Access and Mobility</b>    | Would the proposed alternative improve regional mobility and rail access to key destinations within the project study area?                           | ●     | <ul style="list-style-type: none"> <li>Improved rail access to Albany/Rensselaer and beyond from SW Vermont.</li> <li>Removes one frequency of service from the New York side.</li> </ul>   |
|                                    | Would the proposed alternative lead to travel time savings for potential passengers, as compared to existing travel modes (i.e. rail, car, bus)?      | ●     | <ul style="list-style-type: none"> <li>Potential travel time savings due to new connections.</li> <li>May increase travel time for travelers to/from New York stops.</li> </ul>   |
|                                    | Would the proposed alternative provide a frequency of service and/or routing that would make it an attractive transportation option?                  | ●     | <ul style="list-style-type: none"> <li>More attractive for travelers to/from Vermont; less so for travelers to/from New York side.</li> <li>Based on the Phase One analyses, this alternative is projected to produce the lowest increase in annual ridership for the build alternatives, likely due to removing service from the New York side of the study area.</li> </ul> |
| <b>Transportation Efficiencies</b> | Does the proposed alternative provide viable and useful intermodal connections?   | ●     | Provides connections to cities and major attractions within the study area.   |
|                                    | Is the proposed alternative generally cost efficient in terms of order of magnitude costs?  | ●     | <ul style="list-style-type: none"> <li>Would not require any additional equipment – is anticipated to have the lowest operating cost as compared to the other alternatives.</li> <li>Based on the Phase One capital cost estimates, this alternative is anticipated to require moderate capital investment to implement.</li> </ul>   |
|                                    | Does the proposed alternative maximize use of the existing infrastructure?  | ●     | <ul style="list-style-type: none"> <li>Alternative can be implemented using established, active rail lines.</li> <li>New connections can be established on existing track (in Vermont) with the capacity to support passenger rail.</li> </ul>  |
|                                    | Does the proposed alternative minimize impacts on existing freight and passenger rail operations (post implementation)?                               | ●     | Alternative proposes adding service on the Vermont side of the study area where there is capacity for additional service.   |
|                                    | Can the supporting infrastructure be built with minimum impact on the operations of existing freight and passenger rail services during construction? | ●     | Capital improvements to support the proposed service can be constructed with minimal impact to existing operations.   |

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| Category   | Criterion   | Score | Justification   |
|--|---|-------|---|
| <b>Economic/<br/>Sustainable<br/>Development</b> | Would the alternative support or promote opportunities for Smart Growth & Economic Development? | ●     | Alternative provides improved rail connections to southwest Vermont; however, removing service from the New York side of the study area could limit economic development opportunities. |
|  | Does the proposed alternative minimize potential environmental impacts?                         | ●     | Desktop review revealed no significant environmental impacts (or benefits) that would differentiate one build alternative from the others.  |
| <b>Environmental<br/>Quality</b>                 | Does the proposed alternative result in any potentially positive environmental impacts?         | ●     |   |

**Table 6 - Alternative Six (Split Shuttle Service)**

| Category                           | Criterion   | Score | Justification   |
|------------------------------------|---|-------|---|
| <b>Rail Access and Mobility</b>    | Would the proposed alternative improve regional mobility and rail access to key destinations within the project study area?                           | ●     | Improved rail access throughout the study area.   |
|                                    | Would the proposed alternative lead to travel time savings for potential passengers, as compared to existing travel modes (i.e. rail, car, bus)?      | ●     | Potential travel time savings due to new connections.   |
|                                    | Would the proposed alternative provide a frequency of service and/or routing that would make it an attractive transportation option?                  | ●     | <ul style="list-style-type: none"> <li>• More attractive due to increased coverage and additional frequency on the New York side of study area.</li> <li>• Based on the Phase One analyses, this alternative is projected to produce the second highest increase in annual ridership.</li> </ul>        |
| <b>Transportation Efficiencies</b> | Does the proposed alternative provide viable and useful intermodal connections?   | ●     | Provides connections to cities and major attractions within the study area.   |
|                                    | Is the proposed alternative generally cost efficient in terms of order of magnitude costs?  | ○     | <ul style="list-style-type: none"> <li>• This alternative is anticipated to have the highest operating costs, as compared to the other alternatives.</li> <li>• Based on the Phase One capital cost estimates, this alternative is anticipated to be one of the most expensive to implement.</li> </ul> |
|                                    | Does the proposed alternative maximize use of the existing infrastructure?  | ●     | <ul style="list-style-type: none"> <li>• Alternative can be implemented using established, active rail lines.</li> <li>• New connections can be established on existing track (in Vermont) with the capacity to support passenger rail.</li> </ul>  |
|                                    | Does the proposed alternative minimize impacts on existing freight and passenger rail operations (post implementation)?                               | ○     | Additional passenger service (two frequencies) on the New York side of the study area could lead to capacity issues depending on projected future freight traffic.  |
|                                    | Can the supporting infrastructure be built with minimum impact on the operations of existing freight and passenger rail services during construction? | ●     | Capital improvements to support the proposed service can be constructed with minimal impact to existing operations.   |

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| Category   | Criterion   | Score | Justification  |
|--|---|-------|--|
| <b>Economic/<br/>Sustainable<br/>Development</b> | Would the alternative support or promote opportunities for Smart Growth & Economic Development? | ●     | Due to improved rail connections within the study area and to the region, this alternative has good potential to support economic development opportunities. |
| <b>Environmental<br/>Quality</b>                 | Does the proposed alternative minimize potential environmental impacts?                         | ○     | Desktop review revealed no significant environmental impacts (or benefits) that would differentiate one build alternative from the others.                   |
|  | Does the proposed alternative result in any potentially positive environmental impacts?         | ○     |  |



# B

## Identification and Evaluation of Alternatives - Phase Two

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### Introduction

The purpose of the Phase Two screening process is to identify the Preferred Alternative for the project. During the Phase One screening the initial set of proposed alternatives was narrowed down to two Build Alternatives plus the No-Build Alternative based on criteria developed in accordance with the goals from the Project Purpose and Need Statement.

For the Phase Two evaluation, the Build Alternatives that advanced from the Phase One screening have been defined to a greater level of detail. The following analyses have been developed for the No-Build Alternative and the two Build Alternatives that advanced past the Phase One screen:

- Capital costs;
- Operations and maintenance costs;
- Ridership estimates;
- Operational Analysis/Operating Plans; and
- Review of environmental impacts.

Based on the compiled data and analyses, a detailed assessment of each alternative was performed as part of the Phase Two screening. The alternatives were evaluated against each of the criteria described below and are scored on a scale of +2 (alternative is expected to have a significantly favorable impact), to -2 (alternative is expected to have a significantly unfavorable impact) in each category. A brief description of why the alternatives scored as they did is included. The scores for each of the 25 criteria are then summarized to produce a composite score for each goal and a best fit alternative is identified for each goal.

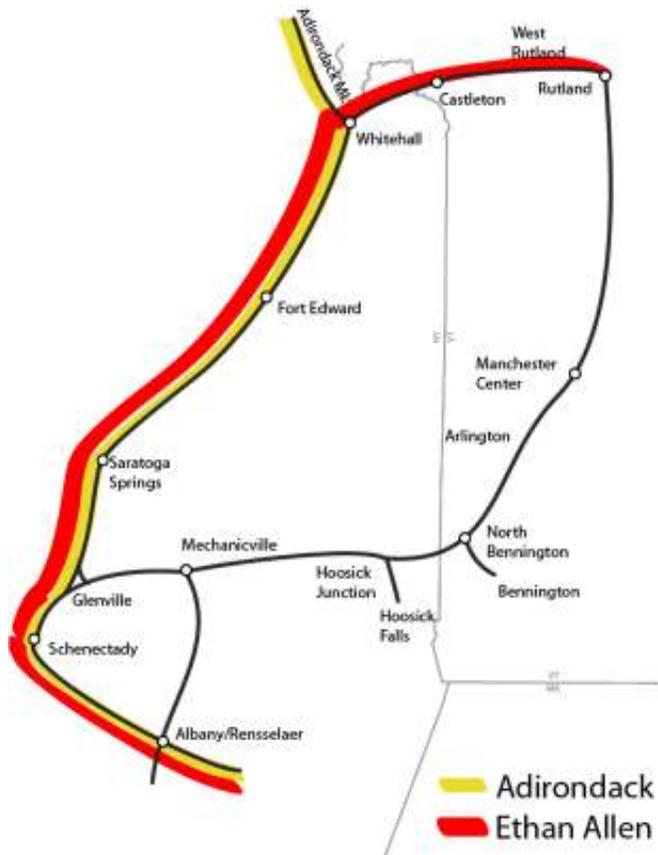


## Description of Alternatives

The No-Build Alternative and the Build Alternatives that advanced from the Phase One Screening are described below.

### No-Build Alternative

Figure 1: No-Build Alternative



The No-Build Alternative consists of the existing transportation systems plus currently planned and programmed track and service improvements in the project study area through the long-range planning horizon (year 2030). The National Environmental Policy Act (NEPA) requires inclusion in the evaluation of alternatives of a No-Build Alternative. It is evaluated to identify the operational and environmental effects on the study area if no action is taken. To meet this NEPA requirement, the No-Build Alternative was advanced to this second phase of the screening process so it can be compared to the final Build Alternatives. Figure 1 provides a schematic drawing of the No-Build Alternative.

Existing passenger rail services in the study area included in the No-Build

Alternative include:

- The **Ethan Allen** service provides connections between Rutland, Vermont and New York City. It makes one round trip daily. Station stops within the project study area include Rutland, and Castleton, Vermont, and Fort Edward/Glens Falls, Saratoga Springs, Schenectady and Albany/Rensselaer, New York.
- The **Adirondack** service provides connections between Montreal and New York City. It makes one round trip daily. Station stops within the project study area include Whitehall, Fort Edward/Glens Falls,



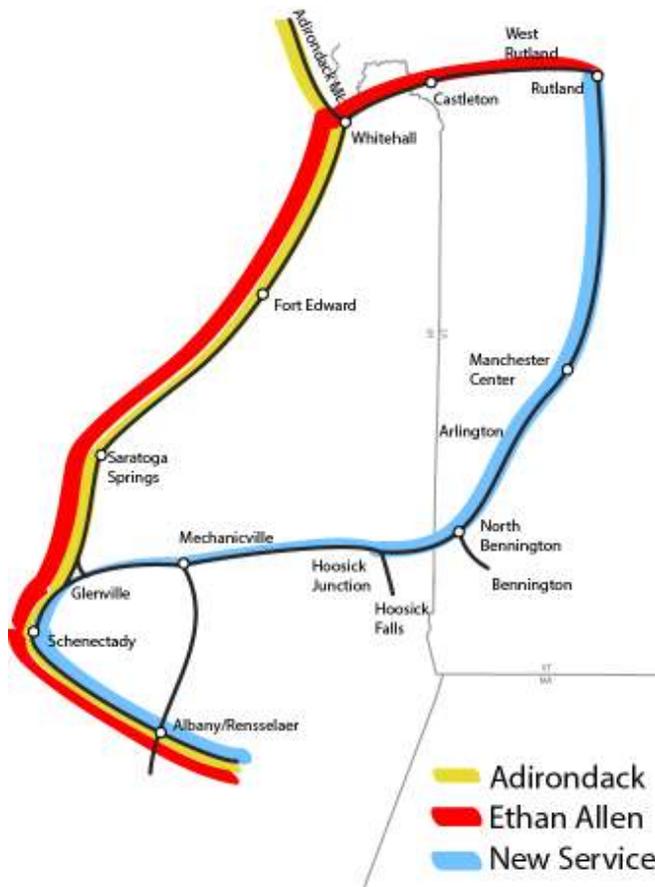
Saratoga Springs, Schenectady and Albany/Rensselaer, New York.

The No-Build Alternative includes programmed and funded improvements to the existing rail infrastructure in the study area. These improvements are:

- Addition of a fourth track at Albany/Rensselaer station (\$58.1M)
- Addition of a second mainline track between Albany/Rensselaer and Schenectady (\$91.2M)
- Two miles of new track at Ballston Spa to provide a five (5) mile segment of double-track extending from Saratoga Springs to Ballston Spa, New York (\$6.6M).

### Alternative 1<sup>1</sup>: New Service to Rutland

Figure 2: Alternative 1, New Service to Rutland



Alternative 1 would extend service to southwest Vermont, with a terminus in Rutland, Vermont. Figure 2 is a schematic map of the New Service to Rutland Alternative.

This alternative would operate out of Albany/Rensselaer, New York station connecting to new stations in Mechanicville, New York and North Bennington and Manchester, Vermont, en route to a terminus in Rutland, Vermont. Alternative 1 would operate one round trip per day.

Alternative 1 proposes a through service, with no transfer needed for service beyond Albany/Rensselaer, New York, along the Empire Corridor. To operate Alternative 1 as a through service, it is proposed that an existing Empire Corridor train that currently terminates at Albany/Rensselaer, New York be extended to

<sup>1</sup> Former Alternative 4 – from the Phase One Screening.

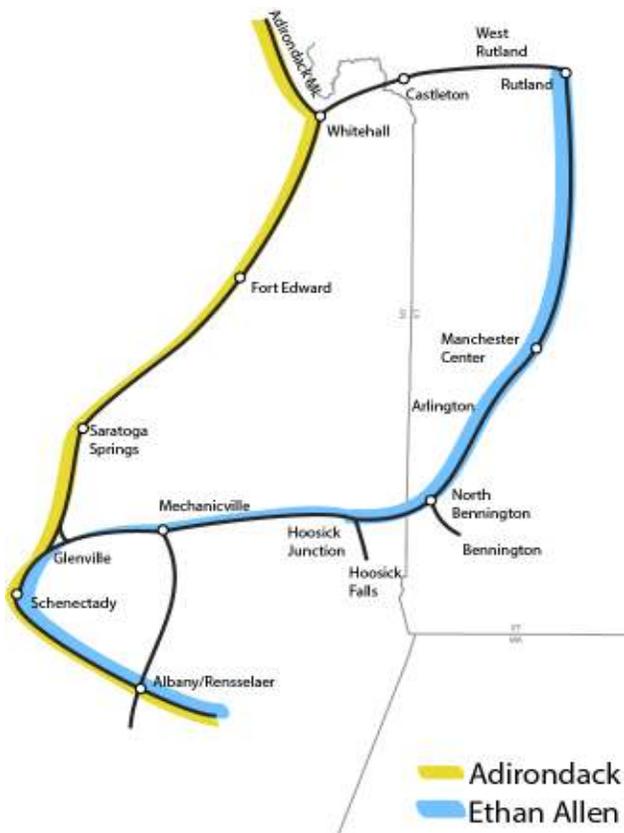


Rutland, Vermont.

In Alternative 1 the Ethan Allen and Adirondack services would continue to operate on the same routes and frequencies (one round trip per day for both) as they do now. Alternative 1 would provide new service to Mechanicville, New York and North Bennington and Manchester, Vermont.

## Alternative 2<sup>2</sup>: Rerouted Ethan Allen Service

Figure 3: Alternative 2 - Reroute Ethan Allen



Alternative 2 proposes re-routing the existing Ethan Allen service through southwest Vermont. The alternative would operate between Rutland, Vermont and Albany/Rensselaer, New York through southwest Vermont with stops in Mechanicville, New York and North Bennington and Manchester, Vermont. Figure 3 is a schematic map of the Rerouted Ethan Allen Service Alternative.

Alternative 2 also proposes a through service, to New York City. Similar to existing Ethan Allen Service, no transfer would be needed for service beyond Albany/Rensselaer, NY along the Empire Corridor.

As part of Alternative 2, the existing Adirondack service would continue to operate on the same route and at the same frequency (one round trip per day) as it does now. The rerouted Ethan Allen service would operate one round trip per day.

With this alternative, service to Castleton would be eliminated while service to Mechanicville, New York and North Bennington and Manchester, Vermont would be added. This alternative would reduce service to one train per day in each direction (Adirondack service only) at Saratoga Springs and Fort Edward.

<sup>2</sup> Former Alternative 5 – from the Phase One Screening.



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## Phase Two Screening

This section includes a discussion of how the No-Build and two Build Alternatives perform with respect to each of the criterion identified in the evaluation methodology. The alternatives are compared with respect to each criterion, and a summary evaluation table is provided at the end of the section.

### ***GOAL 1: Extend Intercity Passenger Rail Access and Improve Mobility***

#### **Directness/Travel Time to Key Regional Destinations**

This criterion focuses on the directness of the trip to key regional destinations within the project study area. The measures of effectiveness (MOE) used to evaluate this criterion are:

- The number of stations that would have train service;
- Transfers required; and
- Cumulative Travel Time

#### *Directness to Key Regional Destinations*

A need identified in the project Purpose and Need is to provide better access to trains service in the study area – particularly in southwestern Vermont. Providing rail access to more towns within the study area will open up better access to regional attractors near the stations. For existing stations within the study area, regional destinations have, in many cases, developed around the stations. The proposed new stations have been placed in locations that are proximate to the highest numbers of regional attractions – in the respective town centers – are along viable (existing) track, and are currently unserved. Table B1 indicates the stations (both existing and proposed) that will be served under each alternative.



Table B1 – Stations with Train Service

| Station                | No Build | Alternative 1 | Alternative2 |
|------------------------|----------|---------------|--------------|
| Rutland                | ●        | ●             | ●            |
| Manchester             |          | ●             | ●            |
| North Bennington       |          | ●             | ●            |
| Mechanicville          |          | ●             | ●            |
| Albany/Rensselaer      | ●        | ●             | ●            |
| Schenectady            | ●        | ●             | ●            |
| Saratoga Springs       | ●        | ●             | ●            |
| Ft. Edward/Glens Falls | ●        | ●             | ●            |
| Whitehall              | ●        | ●             | ●            |
| Castleton              | ●        | ●             |              |
| Rutland                | ●        | ●             | ●            |

1-Assumes shuttle bus service is available from the Stations to the ski resorts and other attractions.

Alternative 1 provides the best access/coverage in the study area since it retains the Ethan Allen service and also adds service along the Western Corridor of Vermont. Alternative 2 also maintains coverage through the New York portion of the study area (via the Adirondack), as well as provide access along the Western Corridor; however, Castleton Station would not be served under this alternative. The No Build maintains the existing service pattern, and the Western Corridor would continue to not be served (except for the existing station at Rutland).

*Transfers Required*

The major difference between the three alternatives is related to how many transfers are required to access each of the station areas in the study area.

- The No-Build Alternative would require travelers to make a transfer (bus or car) to access the Western Corridor and Mechanicville.
- Alternative 1 provides access to all station areas, with no transfers needed.
- Alternative 2 would provide access to the majority of the stations within the study area; however a transfer would be required (likely at Rutland Station) to get to Castleton.



*Cumulative Travel Time*

The travel time from Schenectady Station to the other stations north and west is provided in Table B2. The times are based on travel from Schenectady because the run times from Albany to Schenectady are equal for all three alternatives.

**Table B2 - Cumulative Travel Time**

| Schenectady to:  | No Build          | Alternative 1     | Alternative 2     |
|------------------|-------------------|-------------------|-------------------|
| Rutland          | 2:24 <sup>1</sup> | 2:21 <sup>3</sup> | 2:21 <sup>3</sup> |
| Manchester       | N/A               | 1:40 <sup>3</sup> | 1:40 <sup>3</sup> |
| North Bennington | N/A               | 1:14 <sup>3</sup> | 1:14 <sup>3</sup> |
| Mechanicville    | N/A               | 0:37 <sup>3</sup> | 0:37 <sup>3</sup> |
| Fort Edward      | 0:46 <sup>1</sup> | 0:46 <sup>1</sup> | 0:50 <sup>2</sup> |
| Saratoga Springs | 0:26 <sup>1</sup> | 0:26 <sup>1</sup> | 0:28 <sup>2</sup> |
| Castleton        | 2:00 <sup>1</sup> | 2:00 <sup>1</sup> | N/A               |

- 1- Published travel times for the Ethan Allen Express (per [www.amtrak.com](http://www.amtrak.com) reservation query for 10/2/12)
- 2- Published travel times for the Adirondack Service (per [www.amtrak.com](http://www.amtrak.com) reservation query for 10/2/12)
- 3- Based on the Train Performance Calculator (TPC) from the Rail Traffic Controller model created for the project.

The end-to-end (Schenectady to Rutland) run time is similar for each alternative of the three alternatives. The summary evaluation scores for each of the MOEs for this criterion are provided in Table B3.

**Table B3 – Directness/Travel Time Evaluation Summary**

|                        | No Build | Alternative 1 | Alternative 2 |
|------------------------|----------|---------------|---------------|
| Stations Served        | 0        | +2            | +1            |
| Transfers Required     | 0        | +2            | +1            |
| Cumulative Travel Time | 0        | 0             | 0             |
| Overall Rating         | 0        | +4            | +2            |

**Availability of Intermodal Connections**

This criterion is a simple measure of whether there are intermodal connections (local/regional buses, other rail options) available to travelers at each station. Table B4-A provides a summary of the intermodal connections available at each station (or within ½-mile of the station), by mode. It is assumed that given the non-urban nature of most stations in the study area, most passengers would use taxis or private vehicles to transfer between modes. Table B4-B lists which stations have passenger rail connections, by Alternative.



**Table B4-A: Available Intermodal Connections at Study Area Stations**

| Mode Type                                     | Study Area Stations Served   |
|---|--|
| <b>Passenger Train</b>                        |  |
| Ethan Allen Express (Current)                 | Rutland, Castleton, Ft. Edward/Glens Falls, Saratoga Springs, Schenectady, Albany/Rensselaer |
| Adirondack                                    | Whitehall, Ft. Edward/Glens Falls, Saratoga Springs, Schenectady, Albany/Rensselaer          |
| Saratoga & North Creek                        | Saratoga Springs   |
| Proposed New Service/<br>Rerouted Ethan Allen | Rutland, Manchester, North Bennington, Mechanicville, Schenectady, Albany/Rensselaer         |
| <b>Regional Bus</b>                           |  |
| Adirondack Trailways                          | Saratoga Springs, Schenectady, Albany/Rensselaer   |
| Greyhound                                     | Saratoga Springs, Schenectady, Albany/Rensselaer   |
| Yankee Trails                                 | Albany/Rensselaer  |
| <b>Local Bus</b>                              |  |
| Capital District Transit Authority            | Saratoga Springs, Schenectady, Albany/Rensselaer   |
| Marble Valley Regional Transit District       | Rutland, Manchester  |
| Greater Glens Falls Transit                   | Ft. Edward/Glens Falls   |
| Green Mountain Community Network              | Manchester, North Bennington   |
| Mechanicville City Bus                        | Mechanicville  |

**Table B4-B: Passenger Rail Connections, by Alternative**

| Condition       | No Build  | Alternative 1  | Alternative 2  |
|-----------------|---|--|--|
| <b>Existing</b> | Rutland, Castleton, Whitehall, Ft. Edward/Glens Falls, Saratoga Springs, Schenectady, Albany/Rensselaer | Rutland, Whitehall, Ft. Edward/Glens Falls, Saratoga Springs, Schenectady, Albany/Rensselaer | Rutland, Whitehall, Ft. Edward/Glens Falls, Saratoga Springs, Schenectady, Albany/Rensselaer |
| <b>New</b>      | N/A   | Manchester, N. Bennington, Mechanicville   | Manchester, N. Bennington, Mechanicville   |
| <b>Removed</b>  | N/A   | N/A  | Castleton  |

In terms of intermodal connections, the primary differences between the three alternatives area:

- Both Alternative 1 and 2 will improve the opportunity for intermodal connections in Manchester, North Bennington, and Mechanicville.
- Alternative 2 will remove the passenger rail connection in Castleton; however; and



- The primary regional transfer point at Albany/Rensselaer, where riders can transfer to the Lakeshore Limited or one of the Empire Service trains, will be retained for all of the alternatives.

**Table B5 – Intermodal Connections Evaluation Summary**

|                        | No Build   | Alternative 1                                | Alternative 2   |
|------------------------|------------|--|---|
| Intermodal Connections | No change. | New passenger rail connections at 3 stations | New passenger rail connections at 3 stations, removed connection at 1 station |
| Phase Two Rating       | 0          | +2   | +1  |

**Frequency/Ridership/Population**

This criterion addresses whether the alternative will provide a frequency of service and/or routing that would make it an attractive transportation option by assessing the level of anticipated ridership. The forecast ridership of each alternative, and the population within 10 miles of each station – which may inform the local market for potential passengers, are used as measures of evaluation. Both of the Build Alternatives propose one round trip per day for the new service.

Table B6 provides the forecast annual ridership for each of the alternatives, and Table B7 gives the evaluation scores for each alternative. A summary of the ridership estimates is included as Attachment 1 to this technical memorandum.



**Table B6: Annual Ridership Forecasts<sup>1</sup>**

| STATION                    | 2010<br>Baseline | 2030          |                |                |
|----------------------------|------------------|---------------|----------------|----------------|
|                            |                  | No-Build      | Alternative1   | Alternative2   |
| Montreal - Ft. Ticonderoga | 5,200            | 5,700         | 5,700          | 5,700          |
| Rutland                    | 8,300            | 10,800        | 14,900         | 12,500         |
| Castleton                  | 1,100            | 1,800         | 1,900          | 0              |
| Whitehall                  | 900              | 1,000         | 1,000          | 1,000          |
| Fort Edward/Glens Falls    | 4,300            | 4,600         | 4,500          | 3,100          |
| Saratoga Springs           | 15,100           | 16,600        | 16,500         | 11,300         |
| Schenectady                | 8,100            | 8,400         | 10,300         | 9,200          |
| Manchester                 | --               | --            | 4,400          | 4,400          |
| N. Bennington              | --               | --            | 6,400          | 6,400          |
| Mechanicsville             | --               | --            | 4,600          | 4,600          |
| Albany/Rensselaer          | 3,200            | 3,400         | 3,700          | 3,300          |
| Hudson – NY Penn           | 32,400           | 35,900        | 52,100         | 42,600         |
| <b>TOTAL</b>               | <b>78,600</b>    | <b>88,200</b> | <b>126,000</b> | <b>104,100</b> |

<sup>1</sup> One-way boardings.

**Table B7 – Frequency/Ridership/Population Evaluation Summary**

|  | No Build | Alternative 1              | Alternative 2               |
|--|----------|----------------------------|-----------------------------|
| Forecasted Ridership<br>(2030 Boardings) | 88,200   | 126,000                    | 104,100                     |
| Forecasted Ridership<br>Increase         | 0%       | 42.8%                      | 18.0%                       |
| Population                               | 905,700  | 1,069,873<br>+18%>No Build | 1,038,640<br>+15%> No Build |
| Phase Two Rating                         | 0        | +2                         | +1                          |

***GOAL 2: Maximize Transportation Efficiencies***

**Alternative Costs**

These criteria provide a measure of the financial resources that will be required to make capital improvements (capital costs), to operate and maintain each alternative annually (operations and maintenance costs). Cost per rider is also assessed. Table B8 provides the projected cost and revenue information for each alternative. A summary of the capital cost estimates is included as Attachment 2 to this technical memorandum.



**Table B8 – Cost Evaluation Summary**

|                              | No Build    | Alternative 1 | Alternative 2 |
|------------------------------|-------------|---------------|---------------|
| Capital Cost <sup>1,2</sup>  | \$0         | \$112,244,000 | \$112,244,000 |
| Annual O&M Cost              | \$6,297,000 | \$11,748,000  | \$6,889,000   |
| Third Party Costs            | \$868,000   | \$1,884,000   | \$1,016,000   |
| Route Costs                  | \$5,429,000 | \$9,864,000   | \$5,873,000   |
| Annual Revenue               | \$2,950,000 | \$4,431,000   | \$3,714,000   |
| Net Operating Cost per Rider | \$33.34     | \$69.61       | \$29.52       |
| Phase Two Rating             | 0           | -2            | +2            |

1 Assumes cost for 425-foot, high level platform.

2 Cost includes: labor, burden, construction equipment use, materials, station site acquisition, permanent equipment and contractor's overhead and profit. Does not include contingency allowances.

O&M costs for each alternative were calculated based on the operating cost for the Ethan Allen service. The estimated cost for operating the Ethan Allen service during Fiscal Year 2010-11<sup>3</sup> was used to project the cost for the build alternatives. The 209 cost model is made up of two major cost categories: third party costs and route costs. Route costs consist of activities specific to running the route such as labor or route advertising. Third party costs are those costs paid to the host railroads so that the passenger service may operate over their right-of-way. Table B8 also shows the estimated Third Party Costs and Route Costs for FY 2012.

Annual fare revenue was calculated in the ridership model for the year 2030. The forecasted revenue was prepared using current (2012) fares for existing station-to-station trips (as accessed on the Amtrak website) and developing a similar fare structure for the proposed new stations based on distance between origin and destination. The total fare revenue for each alternative was based on the station-to-station fare multiplied by the projected number of riders traveling between those stations. The O&M costs, total<sup>4</sup> revenue and cost per rider reported in Table B8 are for FY 2012. These 2012 figures were determined by calculating the annual growth in ridership for the Ethan Allen from 2010 (Base Year) to the No Build 2030 scenario, and then applying that growth rate to costs and revenues from FY 2010-11.

**Sustainability/Funding Opportunities**

This criterion evaluates whether an alternative has the potential to be financially sustainable. The financial stability of each alternative is related

<sup>3</sup> Based on the cost methodology developed as part of the coordination for cost-sharing related to Passenger Rail Investment Act of 2008 (PRIIA) Section 209.

<sup>4</sup> Total revenue includes fare revenue (the majority), food and beverage revenue, and other revenue (advertising, etc.).



to the annual operating subsidy (annual O&M cost less the revenue generated). Since the state(s) have limited dollars, those alternatives that require fewer subsidies are preferable.

Funding and cost-sharing opportunities were also evaluated for each alternative and are presented in Table 9. VTrans is the sponsoring agency for the Ethan Allen service and would be for the new service, but could negotiate with NYSDOT on splitting the state’s portion of the annual required subsidy based on train miles per state. For the existing Ethan Allen service extending from Albany north, the Vermont subsidy would be based on the mileage from Fort Edwards – Glen Falls to Rutland, 44 miles, or approximately 44% of the 100-mile route. For the new route along the Western Corridor, the Vermont subsidy would cover from Mechanicville to Rutland, 81.4 miles, or approximately 81% of the 116.7-mile route. If Alternative 2 is selected, Vermont would subsidize 100% of the 116.7-mile route from Albany to Rutland.

**Table 9 – Sustainability Evaluation Summary**

|                                     | No Build    | Alternative 1 | Alternative 2 |
|-------------------------------------|-------------|---------------|---------------|
| Financial Sustainability:           |             |               |               |
| VT Subsidy                          | \$1,473,000 | \$4,235,000   | \$3,175,000   |
| NY Subsidy                          | \$1,874,000 | \$3,083,000   | \$0           |
| Total Subsidy                       | \$3,347,000 | \$7,318,000   | \$3,175,000   |
| Funding /Cost Sharing Opportunities | Yes         | Yes           | Yes           |
| Phase Two Rating                    | 0           | -1            | 0             |

**Construction Impacts on Operations**

This criterion assesses whether the required infrastructure associated with each alternative can be built with minimum impact on the operation of existing freight and passenger rail services during construction. The No Build would have no impact on freight and passenger rail services beyond what is already planned. The impacts associated with both Build Alternatives are expected to be minimal since the sidings and other proposed improvements can be constructed adjacent to the travel way without impacting freight operations. Some coordination for cut-ins of switches would be required. Table 10 gives the evaluation score for each alternative.



**Table B10 – Constructability Evaluation Summary**

|                  | No Build | Alternative 1 | Alternative 2 |
|------------------|----------|---------------|---------------|
| Phase Two Rating | 0        | -1            | -1            |

**Additional Capacity**

Each Build Alternative was analyzed to determine how much additional capacity would be added by implementing the proposed services. Table B11 summarizes the additional train miles, seat miles and revenue vehicle hours for each alternative, as well as the evaluation score.

**Table B11 – Additional Capacity Evaluation Summary**

|                       | No Build   | Alternative 1               | Alternative 2              |
|-----------------------|------------|-----------------------------|----------------------------|
| Train Miles (Annual)  | 73,000     | 158,410                     | 85,410                     |
| Seat Miles (Annual)   | 16,352,000 | 117% increase over No Build | 17% increase over No Build |
| Load Factor           | 65%        | 46%                         | 74%                        |
| Revenue Vehicle Hours | 2,250      | 4,249                       | 1,996                      |
| Phase Two Rating      | 0          | +2                          | +1                         |

**Reliability/Flexibility**

Operational flexibility is dependent on: a) how well service can be provided to passengers when there is an obstacle or outage in some part of the system, and b) frequency of service. Alternative 1 provides operational flexibility to passengers in terms of dealing with obstacles/outages because they have the option to take either the Ethan Allen or the new service, via the Western Corridor, to travel between Rutland and Albany. Neither the No Build nor Alternative 2 provide such flexibility. In terms of flexibility related to schedule choices, the No Build Alternative and Alternative 1 provide greater schedule flexibility along the current Ethan Allen routing – travelers using the Saratoga Springs and Ft. Edward stations have two trains they can use; these passengers would only have one daily option under Alternative 2. It should be noted that although routine passenger service would not be provided between Rutland and Ft. Edward under Alternative 2, that segment of track remains and the option to run trains for emergency service would also be available.

Reliability is a function of how well the system infrastructure accommodates conflicts while still helping trains maintain schedules. Among the proposed improvements for the Build Alternatives are a



number of passing sidings included to accommodate high traffic areas. Table B12 indicated the amount of funding proposed for new passing sidings in the Build Alternatives and also gives the summary evaluation score for this criterion.

**Table B12 – Reliability/Flexibility Evaluation Summary**

|   | No Build | Alternative 1 | Alternative2 |
|---|----------|---------------|--------------|
| Operational Flexibility                     | Least    | Most          | Limited      |
| Costs of improvements to ensure reliability | \$0      | \$10,973,000  | \$10,973,000 |
| Phase Two Rating                            | 0        | +2            | +1           |

**Impact on Rail and Bus Operations**

This criterion measures whether current bus routes and schedules would be affected by the alternative; how each alternative would impact the viability of routes and schedule of currently available passenger rail services; and how the proposed alternatives would impact existing freight operations; including consideration of such factors as operating schedules and potential improvements in infrastructure.

Minor bus reroutes and schedule adjustments are anticipated to provide local and sub-regional circulation options for arriving or departing rail passengers for Alternatives 1 and 2. For passenger rail operations, Alternative 2 reduces the frequency of service to Whitehall, Fort Edward and Saratoga Springs, though these stations would still be served by the Adirondack service, and eliminates it entirely to Castleton. Both Build Alternatives entail infrastructure improvements that would increase the maximum allowable speed (MAS) for both freight and passenger rail operations in some areas.

It is anticipated that the overall net impact to both bus and passenger rail operations will be positive for Alternatives 1 and 2 as both alternatives will produce more ridership than the No Build Alternative. The overall net impact to freight rail operations is anticipated to be neutral. No negative impacts to freight operations are anticipated due to the capacity improvements (sidings) that have been proposed; additionally, the proposed geometry improvements and additional sidings may allow for increased capacity and/or speeds on some segments.



Table B13 includes a summary of the MOEs for these criteria, as well as the evaluation scoring.

**Table B13 – Multi-Modal Operations Evaluation Summary**

|                                     | No Build  | Alternative 1  | Alternative 2  |
|-------------------------------------|-----------|--|--|
| Impact on Bus Operations            | No Impact | Minor reroutes and schedule adjustments to access train stations/match train schedules to facilitate intermodal connections. |  |
| Impact on Passenger Rail Operations | No Impact | Extension of one Empire Corridor trainset serving three new towns.   | Provides service to three new towns. Removes direct train service to Castleton, VT, reduces frequency of service in Ft. Edward and Saratoga Springs. |
| Impact on Freight Operations        | No Impact | Improvement of track and sidings; potential for increased speeds.  | Improvement of track and sidings; potential for increased speeds.  |
| Phase Two Rating                    | 0         | +2   | +1   |

***Goal 3: Support Economic Development and Sustainable Development***

**Accessibility and Connections**

These sub-criteria related to accessibility and connections evaluate how each alternative impacts access to institutional services, regional attractions and tourist destinations within the project study area, with a focus on whether an alternative would allow travelers access without needing a car. It should be noted that since only one round trip is proposed per day, the proposed service would not be considered for daily commuting; however, it does provide connectivity for an overnight trip (or longer). Also, a mode change (buses, taxis or private vehicles) will be necessary to connect passengers to most regional attractions. Table B14 provides a summary of how well each alternative satisfies these criteria, as well as the evaluation scoring.



**Table B14 – Accessibility and Connections Evaluation Summary**

| Criteria   | No Build  | Alternative 1  | Alternative 2  |
|--|---|--|--|
| Accessibility/Connections to Employment                                    | Provides connections between Rutland and major employers in the Albany Capitol District                     | Provides connections between Rutland, Manchester and Bennington and major employers in the Albany Capitol District                     | Provides connections between Rutland, Manchester and Bennington and major employers in the Albany Capitol District                     |
| Accessibility/Connections to Institutional Services                        | Provides access between Rutland and institutional services in the Albany Capitol District and New York City | Provides access between Rutland, Manchester and Bennington and institutional services in the Albany Capitol District and New York City | Provides access between Rutland, Manchester and Bennington and institutional services in the Albany Capitol District and New York City |
| Accessibility/Connections to Regional Attractions and Tourist Destinations | Provides access to regional attractions and destinations in the vicinity of Rutland                         | Provides access to regional attractions and destinations in the vicinity of Rutland, Manchester and Bennington                         | Provides access to regional attractions and destinations in the vicinity of Rutland, Manchester and Bennington                         |
| Phase Two Rating   | 0   | +2   | +2   |

**Opportunities for Smart Growth/Economic Development and Support of Transit Oriented Development (TOD)**

This criterion is a qualitative measure of how well each alternative supports the opportunities for TOD development efforts, and takes into account factors that would support this type of development, such as level of service, mode and location of new stations. Table B15 provides a summary of how well each alternative satisfies these criteria, as well as the evaluation scoring. Attachment 3 includes a summary of the station siting process.



**Table B15 –Smart Growth, Economic Development and TOD Support Evaluation Summary**

|  | No Build   | Alternative 1   | Alternative 2   |
|--|--|---|---|
| Opportunities for Smart Growth/ Economic Development and Support of Transit Oriented Development (TOD) | Opportunities present in the vicinity of existing stations | Opportunities present in the vicinity of existing stations and new stations, if new stations are located in downtown areas. Improved access to regional attractions along Western Corridor will also positively impact economic development in that corridor. | Opportunities present in the vicinity of existing stations and new stations, if new stations are located in downtown areas. Improved access to regional attractions along Western Corridor will also positively impact economic development in that corridor. Reduction in service to existing stations could have minor negative effect. |
| Phase Two Rating   | 0  | +2 <sup>1</sup>   | +1 <sup>1</sup>   |

<sup>1</sup>Assumes new stations are located in downtown areas.

***Goal 4: Protect Environmental Quality***

The environmental criteria are intended to vet the alternatives to ensure that the alternative that is chosen as the preferred alternative will not have any significant adverse impacts on the environment. Table B16 provides a summary of how well each alternative satisfies these criteria, as well as the evaluation scoring.



**Table B16 – Environmental Impact Evaluation Summary**

| Criteria                                      | No Build  | Alternative 1   | Alternative 2   |
|---|---|---|---|
| Current Land Use                              | No effect on existing land uses   | No effect on existing land uses   | No effect on existing land uses   |
| Support for Planned Land Uses                 | Supports current land use, but not regional plans for economic development  | Consistent with Rutland and Bennington County Regional Plans for economic development   | Consistent with Rutland and Bennington County Regional Plans for economic development   |
| Displacement and Relocation Requirements      | No displacements or relocations   | No displacements or relocations for sidings. Land acquisition and limited displacements may be required for new stations.   | No displacements or relocations for sidings. Land acquisition and limited displacements may be required for new stations.   |
| Environmental Justice                         | No effects on low income or minority populations  | No effects on low income or minority populations  | No effects on low income or minority populations  |
| Impacts to Historic/ Archaeological Resources | No effects on historic or architectural resources   | No effects on historic or architectural resources [pending review of new station locations  | No effects on historic or architectural resources [pending review of new station locations  |
| Impacts to 4(f) Properties                    | No effects to Section 4(f) properties   | No effects to Section 4(f) properties   | No effects to Section 4(f) properties   |
| Air Quality                                   | VOC and NO <sub>x</sub> emissions are typically lower than Existing Conditions emissions due to implementation of state and federal emission control programs | Forecasted decrease in VMT (per the ridership model) is anticipated to result in a reduction to VOC, NO <sub>x</sub> , PM and CO emissions as compared to No Build                      | Forecasted decrease in VMT (per the ridership model) is anticipated to result in a reduction to VOC, NO <sub>x</sub> , PM and CO emissions as compared to No Build                      |
| Water Resources/ Floodplains                  | No new impacts to water quality or floodplains.   | No new stormwater discharges to surface water bodies or groundwater anticipated; no impact to floodplains anticipated since rail modification is generally within the existing rail ROW | No new stormwater discharges to surface water bodies or groundwater anticipated; no impact to floodplains anticipated since rail modification is generally within the existing rail ROW |



Table B16 – Environmental Impact Evaluation Summary, continued

| Criteria                        | No Build   | Alternative 1   | Alternative 2  |
|---------------------------------|--|---|--|
| Threatened & Endangered Species | No effects to protected species or their habitat   | One federally listed species and 13 state-listed species recorded near the rail bed between Manchester and Rutland. Potential impacts and avoidance measures will need to be identified during final design   | One federally listed species and 13 state-listed species recorded near the rail bed between Manchester and Rutland. Potential impacts and avoidance measures will need to be identified during final design  |
| Traffic Impacts                 | No significant change anticipated.   | Potential decrease in traffic due to mode switch from cars to rail for trips to/from newly served stations. Marginal positive impact because this alternative produces the highest level of rail ridership, a more efficient means of transportation. | Potential decrease in traffic due to mode switch from cars to rail for trips to/from newly served stations.  |
| Noise and Vibration Impacts     | Existing noise and vibration impacts from passenger and freight rail traffic would continue. | Potential minor increases in noise and vibration at sensitive receptors close to the right-of-way along the Western Corridor and along existing passenger rail alignment from Albany to Schenectady due to new/increased service.                     | Potential minor increases in noise and vibration at sensitive receptors close to the right-of-way along the Western Corridor and along segment from Albany to Schenectady due to new/increased service. Potential decrease in noise and vibration along segment from Schenectady to Rutland due to rerouted Ethan Allen. |
| Phase Two Rating                | 0  | -1  | -1   |

***Other Factors***

A number of other factors could affect the implementation of any of the alternatives being analyzed, and could make one more or less viable than the others. These factors include Public Support for the alternative and Project Schedule Risk.

**Public Support**

This criterion will consider if there will be considerable public support for or opposition to the alternative.

**Project Schedule Risk**



This criterion considers factors that could delay implementation of the project, including:

- Prerequisite projects; such projects may be necessary to satisfy operational requirements or to address/adhere to federal guidelines or requirements; and
- Obtaining approvals from key stakeholders, including the potential host railroad owners and the state Departments of Transportation

Table B17 provides a summary of how each alternative is affected by these factors, as well as the evaluation scoring.

**Table B17 –Summary of Other Impacts**

|                       | No Build | Alternative 1   | Alternative2                          |
|-----------------------|----------|---|---------------------------------------|
| Public Support        | Minimal  | Support has been split between Alternatives 1 and 2 at public meetings and in comments on the project website. Alternative 1 is praised for providing new service to the Western Corridor, while retaining all existing service in the corridor currently served Ethan Allen; however, it is acknowledged that Alternative 2 may be the more cost-feasible means of providing access to passenger rail service in the Western Corridor. |                                       |
| Prerequisite projects | None     | None  | None                                  |
| Approvals needed      | None     | FRA, NY and VT,<br>Pan Am, CP,<br>Amtrak  | FRA, NY and VT,<br>Pan Am, CP, Amtrak |



## Summary and Conclusions

Table B18 includes a summary of the evaluation scores for the Phase Two screening criteria; Table B19 follows with a summary of the key information and findings from the Phase II analyses, by Alternative.

**Table B18 –Summary of Evaluation Scores**

|   | No Build | Alternative 1                     | Alternative 2 |
|---|----------|-----------------------------------|---------------|
| <b>GOAL 1 – Extend Intercity Passenger Rail Access and Improve Mobility</b> |          |                                   |               |
| Directness to Key Regional Destinations                                     | 0        | +2                                | +1            |
| Transfers Required  | 0        | +2                                | +1            |
| Cumulative Travel Time  | 0        | 0                                 | 0             |
| Availability of Intermodal Connections                                      | 0        | +2                                | +1            |
| Frequency/Ridership /Population   | 0        | +2                                | +1            |
| <i>Goal 1 Total:</i>  | <i>0</i> | <i>+8</i>                         | <i>+4</i>     |
| <b>Best Fit Alternative:</b>  |          | <b>X</b>                          |               |
| <b>GOAL 2 – Maximize Transportation Efficiencies</b>                        |          |                                   |               |
| Cost Evaluation   | 0        | -2                                | +2            |
| Construction Impacts on Operations  | 0        | -1                                | -1            |
| Sustainability/Funding Opportunities  | 0        | -1                                | 0             |
| Additional Capacity   | 0        | +2                                | +1            |
| Reliability/Flexibility   | 0        | +2                                | +1            |
| Impacts to Rail and Bus Operations  | 0        | +2                                | +1            |
| <i>Goal 2 Total:</i>  | <i>0</i> | <i>+2</i>                         | <i>+4</i>     |
| <b>Best Fit Alternative:</b>  |          |                                   | <b>X</b>      |
| <b>GOAL 3 – Support Economic Development and Sustainable Development</b>    |          |                                   |               |
| Accessibility/Connections   | 0        | +2                                | +2            |
| Smart Growth  | 0        | +2                                | +1            |
| <i>Goal 3 Total:</i>  | <i>0</i> | <i>+4</i>                         | <i>+3</i>     |
| <b>Best Fit Alternative:</b>  |          | <b>X</b>                          |               |
| <b>GOAL 4 – Protect Environmental Quality</b>                               |          |                                   |               |
| Environmental Impacts   | 0        | -1                                | -1            |
| <i>Goal 4 Total:</i>  | <i>0</i> | <i>-1</i>                         | <i>-1</i>     |
| <b>Best Fit Alternative:</b>  |          | <b>Alternatives 1 &amp; 2 tie</b> |               |
| <b>TOTAL:</b>   | <b>0</b> | <b>+13</b>                        | <b>+10</b>    |
| <b>Preferred Alternative:</b>   |          | <b>X</b>                          |               |



Table B19 breaks down the evaluation scores by goal and reveals the following trends:

- Both Build Alternatives propose adding service in the Western Corridor of Vermont, but *Alternative 1 best satisfies Goal 1* because it adds service to new segments of the study area without removing service from any existing station areas. Under Alternative 2, service would still be available along much of the existing Ethan Allen alignments – via the Adirondack Service; however, there would be one less roundtrip available for portions of the current Ethan Allen alignment. Additionally, Castleton will no longer be served directly by passenger rail.
- *Alternative 2 best satisfies Goal 2*, due in major part to the cost difference associated with running two services (Alternative 1) versus one service (Alternative 2). Alternative 2 outperforms both the No Build and Alternative 1 in terms of the net cost per rider and the subsidy that would be required to support the service.
- *Alternatives 1 best satisfies Goal 3*, and is anticipated to slightly better support economic development and sustainable development. The major driver for both of these objectives will be the placement of new stations, which will be the same for both Alternatives. The removal of one round trip, as is proposed under Alternative 2, may have some negative impact to economic development at the stations where service is reduced.
- Both Alternative 1 and 2 are expected to have a similar (minimal) impact on the environment. It should be noted that both Build alternatives would also have potential for reduced traffic and improved air quality due to a reduction in annual VMT.

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## Conclusion

The purpose of the screening process is to identify which alternative(s) best satisfy the Purpose and Need for the project, which states:

*The purpose of this project is to identify and establish an efficient intercity passenger rail-based transportation link that will benefit un-served and underserved communities in southwestern Vermont and eastern central New York. The project would provide intercity passenger rail connections between Rutland, Vermont and Albany, New York, with new intercity passenger rail*



*services in southwestern Vermont and improvements to existing intercity passenger rail services in eastern central New York State. The project would also provide a key link along Vermont's "Western Corridor", with improved connections to passenger rail services in New York and beyond via Albany and/or Schenectady, New York.*

The Build Alternatives described herein are best able to satisfy the goal of providing passenger rail service along Vermont's Western Corridor. Notably, both alternatives:

- Provide access to passenger rail service at three new stations where there is no current service;
- Increase ridership over the No Build Alternative; and
- Due to improved access to passenger rail, provide for improved economic development opportunities along the Western Corridor.

As has been noted previously, the major difference between the two Build Alternatives is that Alternative 1 provides new service in the Western Corridor, while preserving both existing frequencies of service through the New York portion of the study area, while Alternative 2 would reroute the Ethan Allen from its existing alignment into the Western Corridor – leaving a single frequency of service (the Adirondack Service) through the New York portion of the study area. This distinction has the greatest impacts on ridership and operations and maintenance costs; the major pros and cons for each of the Build Alternatives are summarized below.

#### **Alternative 1**

**Pros:** Provides equivalent (to existing) or better access to passenger rail service *throughout* the study area; wider range of mode choices throughout the study area; operational and schedule flexibility in the New York portion of the study area, as compared to Alternative 2; higher anticipated ridership than Alternative 2.

**Cons:** Higher operating cost than Alternative 2.

#### **Alternative 2**

**Pros:** Lower operating costs than Alternative 1; provides service to the Western Corridor.

**Cons:** Removes one frequency or service along the existing Ethan Allen corridor, which negatively impacts anticipated ridership.



*Based on this Phase Two evaluation, Alternative 1 is the Preferred Alternative recommended for further development.*



Table B19 – Evaluation Summary Table

|   | No Build   | Alternative 1: New Service to Rutland   | Alternative 2: Reroute Ethan Allen   |
|---|--|---|--|
| <b>Goal 1: Extend Intercity Passenger Rail Access and Improve Mobility</b>                                    |  |   |  |
| <i>Directness/Travel Time to Key Regional Destinations:</i>   | Train access is provided to regional destinations in the New York portion of the study area only (along the Ethan Allen corridor). | Train access is provided to regional destinations in both New York (Adirondack and Ethan Allen) and in the Western Corridor of Vermont (New Service). | Train access is provided to regional destinations in both New York (Adirondack) and in the Western Corridor of Vermont (rerouted Ethan Allen). |
| <ul style="list-style-type: none"> <li>Directness of the trip to key regional destinations.</li> </ul>        |  |   |  |
| <ul style="list-style-type: none"> <li>Transfers required</li> </ul>  | Required for access to Western Corridor  | No transfers required.  | Requires a transfer at Rutland to get to Castleton.  |
|   | <i>Schenectady to:</i>   | <i>Schenectady to:</i>  | <i>Schenectady to:</i>   |
|   | Rutland 2:24   | Rutland 2:21  | Rutland 2:21   |
|   | Manchester N/A   | Manchester 1:40   | Manchester 1:40  |
| <ul style="list-style-type: none"> <li>Cumulative travel time (Schenectady to study area stations)</li> </ul> | North Bennington N/A   | North Bennington 1:14   | North Bennington 1:14  |
|   | Mechanicville N/A  | Mechanicville 0:37  | Mechanicville 0:37   |
|   | Fort Edward 0:46   | Fort Edward 0:46  | Fort Edward 0:50   |
|   | Saratoga Springs 0:26  | Saratoga Springs 0:26   | Saratoga Springs 0:28  |
|   | Castleton 2:00   | Castleton 2:00  | Castleton N/A  |
| <i>Availability of Intermodal Connections:</i>  | <b>Train:</b> Connections to other routes at 4 stations in the study area.   | <b>Train:</b> Connections to other routes at 5 stations in the study area.  | <b>Train:</b> Connections to other routes at 2 stations in the study area.   |
| <ul style="list-style-type: none"> <li>Presence of intermodal connections at each station.</li> </ul>         | <b>Local Bus:</b> Connections at 6 stations.   | <b>Local Bus:</b> Connections at 9 stations.  | <b>Local Bus:</b> Connections at 8 stations.   |
|   | <b>Regional Bus:</b> Connections at 3 stations.  | <b>Regional Bus:</b> Connections at 3 stations.   | <b>Regional Bus:</b> Connections at 3 stations.  |
| <i>Frequency/Ridership<sup>5</sup>/ Population within 10-mile Radius of study area stations (2010 Census)</i> | 1 train per day.<br>Total ridership: 88,200<br>Population: 905,700   | 1 train per day.<br>Total ridership: 126,000<br>Population: 1,069,873 (18% increase)  | 1 train per day.<br>Total ridership: 104,100<br>Population: 1,038,640 (15% increase)   |

<sup>5</sup> Ridership numbers reflect one-way boardings with one trip end associated with a station in the study area.

**Table B19 – Evaluation Summary Table (Continued)**

|  | No Build   | Alternative 1: New Service to Rutland  | Alternative 2: Reroute Ethan Allen   |
|--|--|--|--|
| <b>Goal 2: Maximize Transportation Efficiencies</b>  |  |  |  |
| <i>Capital Cost</i>  | \$0  | \$112,244,000  | \$112,244,000  |
| <i>Annual Operations and Maintenance Cost</i>  | \$6,297,000  | \$11,748,000   | \$6,889,000  |
| <i>Annual Revenue</i>  | \$2,950,000  | \$4,431,000  | \$3,714,000  |
| <i>Net Operating Cost per Rider</i>  | \$33.34  | \$69.61  | \$29.52  |
| <i>Constructability</i>  |  |  |  |
| <ul style="list-style-type: none"> <li>Impact on the operation of existing freight and passenger rail services during construction.</li> </ul> | No additional impact.  | No major impacts are anticipated to existing freight or passenger rail operations during construction.   | No major impacts are anticipated to existing freight or passenger rail operations during construction.   |
| <i>Sustainability/Funding Opportunities</i>  |  |  |  |
| <ul style="list-style-type: none"> <li>Financially sustainable.</li> </ul>   | No change from existing.   | Highest O&M costs due to operating two services. 117 percent increase in annual train miles vs. 43 percent increase in ridership (revenue).  | 17 percent increase in annual train miles vs. 18 percent increase in ridership (revenue).  |
| <i>Funding and cost-sharing opportunities</i>  | VTrans is the sponsoring agency for the Ethan Allen (EA) service. VTrans splits the annual O&M subsidy with NYSDOT based on each state's portion of the total train miles.<br><br>EA: 44 miles (VT), 56 miles (NY)<br><br>\$1,473,000 (VT), \$1,874,000 (NY) | VTrans would be the sponsoring agency for new service, but could negotiate with NYSDOT on splitting the state's portion of the annual O&M subsidy by train miles per state.<br><br>EA: 44 miles (VT), 56 miles (NY)<br>New Service: 82 miles (VT), 35 miles (NY)<br><br>\$4,235,000 (VT), \$3,083,000 (NY) | VTrans would be the sponsoring agency for the rerouted Ethan Allen (EA) service. Since this alternative primarily benefits Vermont, VTrans would be responsible for 100% of the annual O&M subsidy.<br><br>Rerouted EA: 117 miles (VT), 0 miles (NY)<br><br>\$3,175,000 (VT), \$0 (NY) |
| <i>Additional Capacity Train Miles (annual)</i>  | 73,000   | 158,410  | 85,410   |

**Table B19 – Evaluation Summary Table (Continued)**

|   | No Build  | Alternative 1: New Service to Rutland   | Alternative 2: Reroute Ethan Allen   |
|---|---|---|--|
| Seat Miles <sup>6</sup> (annual)  | 16,352,000  | 117% increase over No Build   | 17% increase over No Build   |
| Revenue Vehicle Hours   | 6.17 hr/day*365= 2,250  | (6.17(EA)+5.47(New))*365=4,249  | 5.47hr/day*365= 1,996  |
| <ul style="list-style-type: none"> <li>Operational flexibility</li> </ul>                     | No additional operational flexibility over existing condition.                          | Provides the opportunity, in the event of a disruption, to get trains from Rutland to Albany via two routes (redundant routes). No additional flexibility over existing condition for other stations in the study area. | No additional operational flexibility over existing condition.   |
| <ul style="list-style-type: none"> <li>Costs of improvements to ensure reliability</li> </ul> | None  | \$10,973,000  | \$10,973,000   |
| <i>Impact on Bus Operations</i>   | None  | Minor rerouting to access rail stations   | Minor rerouting to access rail stations  |
| <i>Impacts to Existing Passenger Rail Operations</i>  | None  | Extension of one Empire Corridor trainset   | Relocation of Ethan Allen service to Western Corridor  |
| <i>Impacts to Freight Operations</i>  | None  | Improvement in track and sidings  | Improvement in track and sidings   |
| <b>Goal 3: Support Economic Development and Sustainable Development</b>                       |   |   |  |
| <i>Accessibility/Connections to Employment</i><br>Connections to major employers              | Provides connections between Rutland and major employers in the Albany Capitol District | Provides connections between Rutland, Manchester and Bennington and major employers in the Albany Capitol District  | Provides connections between Rutland, Manchester and Bennington and major employers in the Albany Capitol District |
| Allow access without needing a car  | Provides transit access between Rutland, Albany Capitol District, and New York City     | Provides transit access between Rutland, Manchester, Bennington and Albany Capitol District, and NYC  | Provides transit access between Rutland, Manchester, Bennington, Albany Capitol District, & NYC                    |

<sup>6</sup> Assumes 4-car trainset for each alternative (2 coaches, 1 business class, 1 club dinette=224 seats).



**Table B19 – Evaluation Summary Table (Continued)**

|  | <b>No Build</b>   | <b>Alternative 1: New Service to Rutland</b>   | <b>Alt.2: Reroute Ethan Allen</b>  |
|--|---|--|--|
| <i>Accessibility/Connections to Institutional Services</i>   | Provides access between Rutland and institutional services in the Albany Capitol District and New York City | Provides access between Rutland, Manchester and Bennington and institutional services in the Albany Capitol District and New York City   | Provides access between Rutland, Manchester and Bennington and institutional services in the Albany Capitol District and New York City   |
| <i>Accessibility/Connections to Regional Attractions and Tourist Destinations</i>                            | Provides access to regional attractions and destinations in the vicinity of Rutland                         | Provides access to regional attractions and destinations in the vicinity of Rutland, Manchester and Bennington   | Provides access to regional attractions and destinations in the vicinity of Rutland, Manchester and Bennington   |
| <i>Opportunities for Smart Growth/Economic Development and Support of Transit Oriented Development (TOD)</i> | Opportunities present in the vicinity of existing stations  | Opportunities present in the vicinity of existing stations and new stations, if new stations are located in downtown areas. Consistent with Rutland and Bennington County Regional Plans for economic development. | Opportunities present in the vicinity of existing stations and new stations, if new stations are located in downtown areas. Consistent with Rutland and Bennington County Regional Plans for economic development. |
| <b>Goal 4: Protect Environmental Quality</b>   |   |  |  |
| <i>Land Use</i>  |   |  |  |
| <ul style="list-style-type: none"> <li>Current land uses within the study area</li> </ul>                    | No effect on existing land uses   | No effect on existing land uses  | No effect on existing land uses  |
| <ul style="list-style-type: none"> <li>Support for planned land uses</li> </ul>                              | Supports current land use   | Consistent with Rutland and Bennington County Regional Plans   | Consistent with Rutland and Bennington County Regional Plans   |
| <i>Displacement and Relocation Requirements</i>  | No displacements or relocations   | No displacements or relocations. Minor land acquisition (of undeveloped land) required for new stations.   | No displacements or relocations. Minor land acquisition (of undeveloped land) required for new stations.   |
| <i>Environmental Justice</i>   | No effects on low income or minority populations  | No effects on low income or minority populations   | No effects on low income or minority populations   |
| <i>Impacts to Historic or Architectural Resources</i>  | No effects on historic or architectural resources   | No effects on historic or architectural resources [pending review of new station locations]  | No effects on historic or architectural resources [pending review of new station locations]  |
| <i>Impacts to Section 4(f) Properties</i>  | No effects to Section 4(f) properties   | No effects to Section 4(f) properties  | No effects to Section 4(f) properties  |

**Table B19 – Evaluation Summary Table (Continued)**

|  | <b>No Build</b>   | <b>Alternative 1: New Service to Rutland</b>  | <b>Alt.2: Reroute Ethan Allen</b>  |
|--|---|---|--|
| <i>Air Quality</i>                         | VOC and NO <sub>x</sub> emissions are typically lower than Existing Conditions emissions due to implementation of state and federal emission control programs | Forecasted decrease in VMT (per the ridership model) is anticipated to result in a reduction to VOC, NO <sub>x</sub> , PM and CO emissions as compared to No Build  | Forecasted decrease in VMT (per the ridership model) is anticipated to result in a reduction to VOC, NO <sub>x</sub> , PM and CO emissions as compared to No Build   |
| <i>Water Resources/ Floodplains</i>        | No new impacts to water quality or floodplains.   | No new stormwater discharges to surface water bodies or groundwater anticipated; no impact to floodplains anticipated since rail modification is generally within the existing rail ROW   | No new stormwater discharges to surface water bodies or groundwater anticipated; no impact to floodplains anticipated since rail modification is generally within the existing rail ROW  |
| <i>Threatened &amp; Endangered Species</i> | No effects to protected species or their habitat  | One federally listed species and 13 state-listed species recorded near the rail bed between Manchester and Rutland. Potential impacts and avoidance measures will need to be identified during final design   | One federally listed species and 13 state-listed species recorded near the rail bed between Manchester and Rutland. Potential impacts and avoidance measures will need to be identified during final design  |
| <i>Traffic Impacts</i>                     | No significant change anticipated.  | Potential decrease in traffic due to mode switch from cars to rail for trips to/from newly served stations.   | Potential decrease in traffic due to mode switch from cars to rail for trips to/from newly served stations.  |
| <i>Noise and Vibration Impacts</i>         | Existing noise and vibration impacts from passenger and freight rail traffic would continue.  | Potential minor increases in noise and vibration along existing passenger rail routes due to increased service. Potential to increase noise and vibration impacts at sensitive receptors close to the right-of-way along the western corridor.  | Potential to increase noise and vibration impacts at sensitive receptors close to the right-of-way along the western corridor. Potential decrease in noise and vibration along segment from Whitehall to Rutland if Ethan Allen service is rerouted. |
| <b>Other Factors</b>                       |   |   |  |
| <i>Public Support</i>                      | Minimal   | Support has been split between Alternatives 1 and 2 at public meetings and in comments on the project website. Alternative 1 is praised for providing new service to the Western Corridor, while retaining all existing service in the corridor currently served Ethan Allen; however, it is acknowledged that Alternative 2 may be the more cost-feasible means of providing access to passenger rail service in the Western Corridor. |  |



**Table B19 – Evaluation Summary Table (Continued)**

|                              | No Build | Alternative 1: New Service to Rutland  | Alt.2: Reroute Ethan Allen             |
|------------------------------|----------|--|--|
| <i>Project Schedule Risk</i> |          |  |  |
| • Prerequisite projects      | None     | None                                   | None                                   |
| • Approvals needed           | None     | FRA, NY and VT, Pan Am, CP, and Amtrak | FRA, NY and VT, Pan Am, CP, and Amtrak |





Memorandum

To: Costa Pappis, VTRANS

Date: May 3, 2013 (Revised January 8, 2014)

Project No.: 11518.00

From: Lara Webster, VHB

Re: NY-VT Ridership and Revenue Forecasts  
Revision and Update

The purpose of this memorandum is to present the results of the revised ridership forecast for the NY-VT Intercity Passenger Rail Study Area. Three alternatives were analyzed:

- 1) No Build Alternative
- 2) Alternative 1 – New Service to SW Vermont
- 3) Alternative 2 – Rerouted Ethan Allen Service

For both Build alternatives, service would be provided to Rutland via the “Western Corridor”; however Alternative 1 retains the Ethan Allen service – which provides service to Rutland through New York – and Alternative 2 reroutes the Ethan Allen through southwest Vermont. Both alternatives assume the routing from Albany to Mechanicville is via Schenectady. **Figures 1 and 2** below, illustrate the two Build alternatives.

Figure 1: Alternative 1 – New Service to SW Vermont

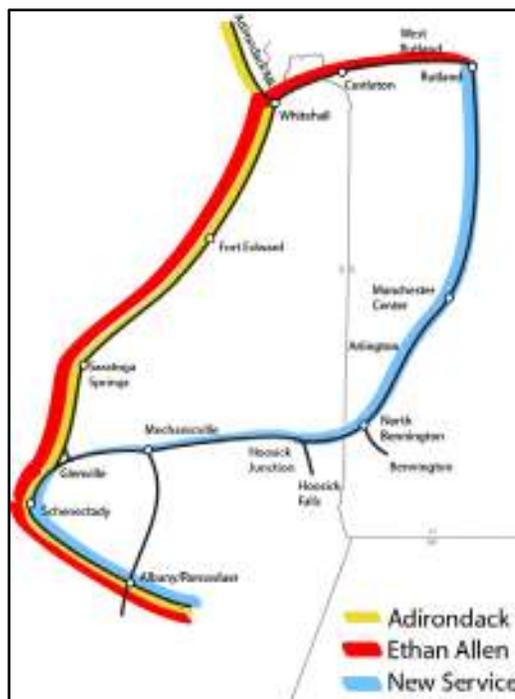
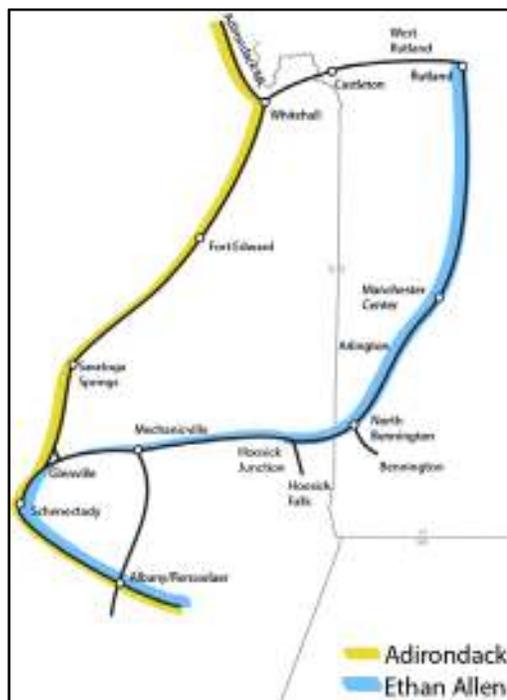


Figure 2: Alternative 2 – Rerouted Ethan Allen Service



The original ridership forecasts were developed using an analytical procedure considering the following information:

- Existing demographic and economic conditions in Study Area;
- Forecasted demographic and economic conditions in the Study Area;
- Rail ridership of existing services in the region, specifically the ridership of the Adirondack and Ethan Allen services operated by Amtrak;
- Ridership for station pairs served by the Adirondack and Ethan Allen services;
- Service level and fare of existing and proposed rail service in the region; and
- Travel time, operating costs and toll costs of automobile drivers or passengers in the region

The ridership forecasting procedure is district-to-district based. The Study Area has been divided into traffic districts, each representing the catchment area of an existing or new rail station. For the purposes of the ridership analysis, the catchment areas were defined as the 10-mile buffer around each station. If a portion of a town fell within 10 miles of a station it was assigned to a station (Figure 3). Towns that fell within 10 miles of two stations were assigned to the closest station.

Figure 3: Catchment Areas of Stations

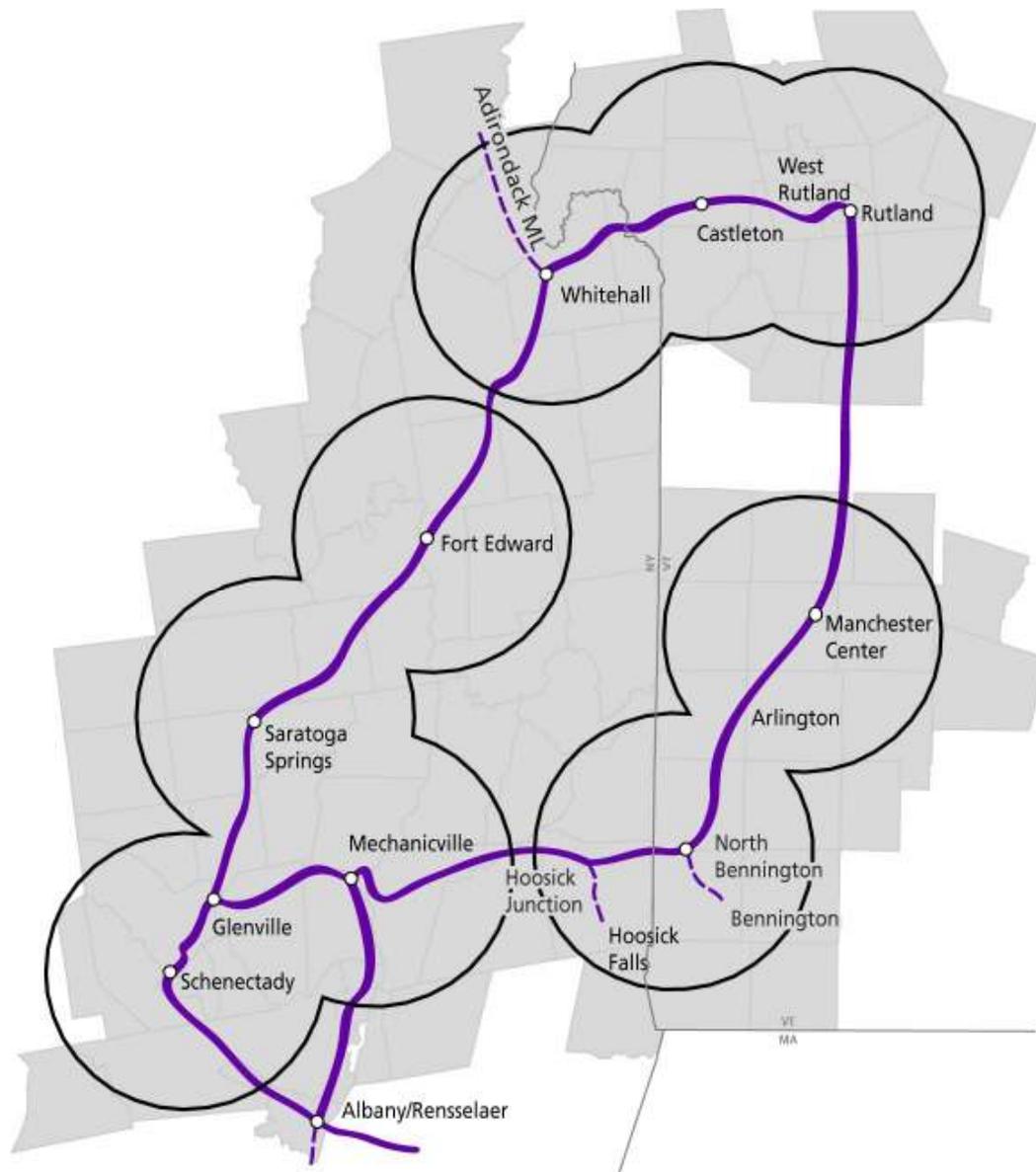
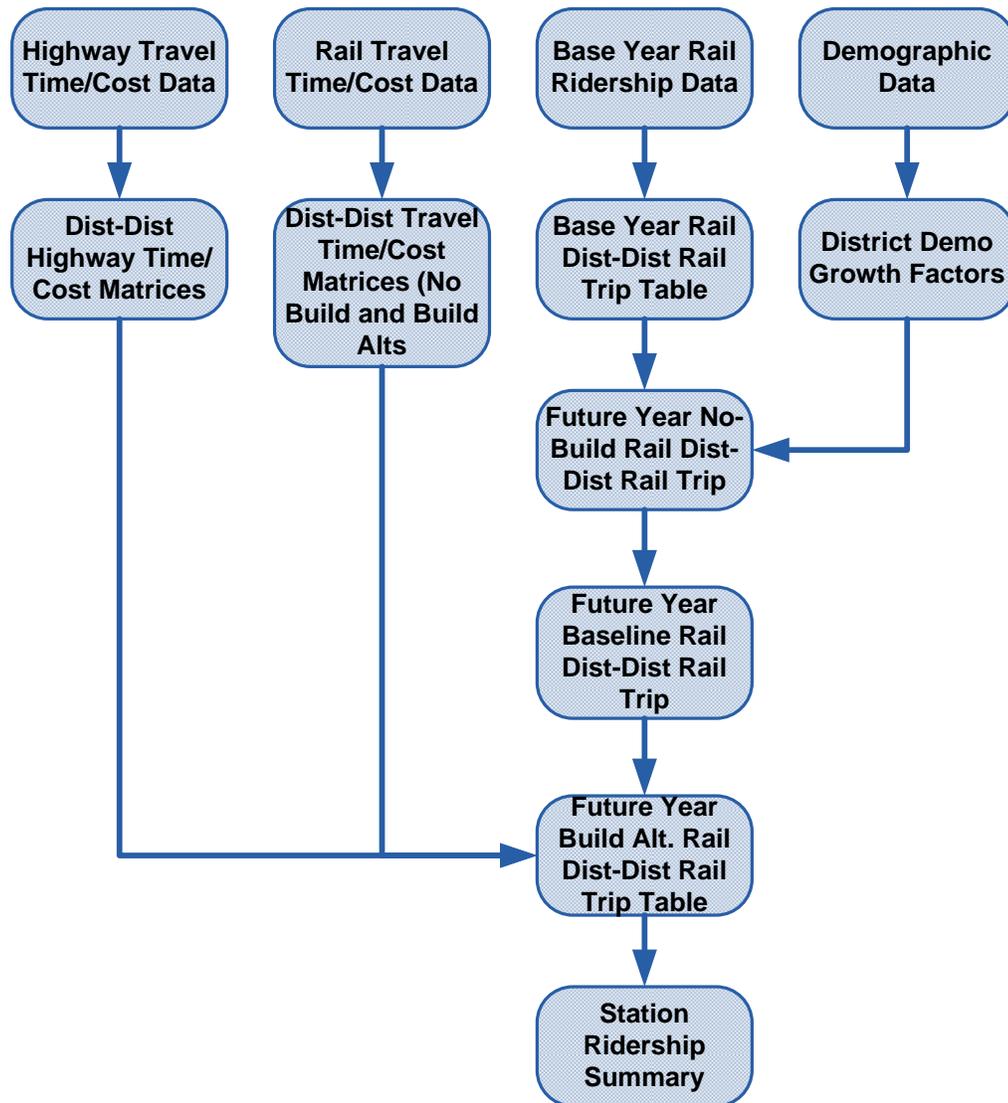


Figure 4 provides a flow chart of the ridership forecasting methodology.

**Figure 4: Ridership Forecasting Process**



## District Demographic Data

The demographic data (households, population and employment) were assembled for each traffic district. The data were derived from the demographic data of the area travel demand models received from the State of Vermont, the Capital District Transportation Committee (CDTC) and the Adirondack/Glen Falls Transportation Council (AGFTC). Table 1 summarizes the existing and projected demographic data by traffic district.

**Table 1: Households and Employment by Traffic District**

| Station          | 2010       | 2010       | 2030       | 2030       |
|------------------|------------|------------|------------|------------|
|                  | Households | Employment | Households | Employment |
| Rutland          | 16,400     | 22,100     | 20,300     | 32,700     |
| Castleton        | 4,900      | 3,900      | 6,500      | 5,900      |
| Whitehall        | 9,900      | 8,500      | 10,900     | 9,200      |
| Fort Edwards     | 28,200     | 34,600     | 31,000     | 36,800     |
| Saratoga Springs | 32,300     | 36,500     | 37,700     | 38,300     |
| Schenectady      | 92,200     | 97,800     | 99,100     | 101,700    |
| Manchester       | 5,400      | 6,300      | 7,000      | 12,600     |
| North Bennington | 14,000     | 16,100     | 15,300     | 21,100     |
| Mechanicsville   | 34,500     | 28,100     | 40,200     | 34,400     |

## District-to-District Travel Time/Cost Matrices

The district-to-district travel time and travel cost matrices for the rail mode and automobile mode were assembled based on data from:

- AMTRAK schedule and fare information
- Proposed service plans of the build alternatives
- A GIS roadway network covering the study area. Travel times were based on distances and assumed travel speeds. The travel speeds were based on regional travel demand model assumptions and posted speed limits.
- For the rail mode, the following district-to-district matrices were generated:
- In-vehicle times (time spent on rail train)
- Average wait time derived from the service frequency
- Rail fare
- Auto access and egress time

For the auto mode, the average travel time and operation cost matrices were generated based on the highway network developed for this study.

## Base Year Rail Trip Table

The base year station to station rail trip table was constructed based on collected ridership data provided by Amtrak. Amtrak provided the station ridership on the Adirondack and Ethan Allen services, as well as ridership of major station-to-station pairs on these lines. Based on these two sets of data, an estimation procedure was applied to derive the complete station-to-station rail trip table of the two rail lines.

The following table summarizes the Year 2010 annual ridership of existing rail stations in the study region.

**Table 2: Year 2010 Baseline Station Ridership**

| Station          | Baseline Ridership <sup>1</sup> | Households within 10 miles of station | Rail Ridership/HH |
|------------------|---------------------------------|---------------------------------------|-------------------|
| Rutland          | 16,600                          | 16,400                                | 1.00              |
| Castleton        | 2,200                           | 4,900                                 | 0.45              |
| Whitehall        | 1,800                           | 9,900                                 | 0.18              |
| Fort Edward      | 8,600                           | 28,200                                | 0.30              |
| Saratoga Springs | 30,200                          | 32,300                                | 0.94              |
| Schenectady      | 16,200                          | 92,200                                | 0.18              |

<sup>1</sup> Values refer to annual boardings and alightings combined.

**Table 3** shows the results of the revised ridership forecasts.

**Table 3 – Revised Annual Boardings Forecasts**

| Year | No Build | Alternative 1 | Alternative 2 |
|------|----------|---------------|---------------|
| 2010 | 78,600   | --            | --            |
| 2030 | 88,200   | 126,000       | 104,100       |

The ridership results reflect refinements to the model to reflect the following:

- Updated (train) travel times.** The travel times used in the refined model are based on the Rail Traffic Controller (RTC) model. The infrastructure used in the model was prepared to run the model's Train Performance Calculator (TPC) which calculated travel times between station based on the operating speeds of the train, the tractive effort and braking, station stops and cumulative travel times. The times used for the original ridership analysis were calculated based on distance between stations, assumed Maximum Allowable Speed (MAS), and a (conservative) impedance factor that was applied across the board. The travel times generated as part of the TPC run are faster than the originally calculated times.
- Updated fares.** For the original iteration of the ridership analysis, fares were matched to existing, published fares for Amtrak trips (Ethan Allen or Adirondack) of similar trip length for the trip pairs in the study area. The refined ridership model reflects current fares for the Ethan Allen service and incremental fares based on average cost per mile for non-Ethan Allen trip pairs.

Refined forecasts were completed for the No Build and the two Build alternatives still being analyzed. **Table 4** shows the updated annual boardings forecast for the years 2013 through 2017. To develop estimates for 2013 through 2017, the rate of growth from the 2010 to 2030 No-Build boardings was determined, and a straight line percentage difference in ridership was assumed for the interim years for each alternative.

**Table 4 – 2013 - 2017 Annual Boardings**

| Year | No Build | Alternative 1 | Alternative 2 |
|------|----------|---------------|---------------|
| 2013 | 79,980   | 114,100       | 98,350        |
| 2014 | 80,440   | 114,770       | 98,920        |
| 2015 | 80,910   | 115,440       | 99,500        |
| 2016 | 81,380   | 116,120       | 100,080       |
| 2017 | 81,860   | 116,800       | 100,670       |

**Table 5** provides the revised annual boardings by station for the 2010 base year and projected to 2030.

**Table 5 – Revised 2030 Annual Boardings Forecasts**

| Station                    | 2010          | 2030          |                |                |
|----------------------------|---------------|---------------|----------------|----------------|
|                            | No Build      | No Build      | Alternative 1  | Alternative 2  |
| Montreal - Ft. Ticonderoga | 5,200         | 5,700         | 5,700          | 5,700          |
| Rutland                    | 8,300         | 10,800        | 14,900         | 12,500         |
| Castleton                  | 1,100         | 1,800         | 1,900          | 0              |
| Whitehall                  | 900           | 1,000         | 1,000          | 1,000          |
| Fort Edward                | 4,300         | 4,600         | 4,500          | 3,100          |
| Saratoga Springs           | 15,100        | 16,600        | 16,500         | 11,300         |
| Schenectady                | 8,100         | 8,400         | 10,300         | 9,200          |
| Manchester                 | --            | --            | 4,400          | 4,400          |
| North Bennington           | --            | --            | 6,400          | 6,400          |
| Mechanicville              | --            | --            | 4,600          | 4,600          |
| Albany/Rensselaer          | 3,200         | 3,400         | 3,700          | 3,300          |
| Hudson - NY Penn           | 32,400        | 35,900        | 52,100         | 42,600         |
| <b>Total</b>               | <b>78,600</b> | <b>88,200</b> | <b>126,000</b> | <b>104,100</b> |

Note: Ridership numbers reflect one-way boardings.

**Table 6** presents the projected boardings by station and service. Stations that would be served by more than one service have had their annual boardings divided approximately equally between the services.

**Table 6 – Annual Boardings by Service**

| Station                                       | 2,010         |             | 2030          |             |                |             |             |                |             |
|---|---------------|-------------|---------------|-------------|----------------|-------------|-------------|----------------|-------------|
|   | No Build      |             | No Build      |             | Alternative 1  |             |             | Alternative 2  |             |
|   | Adirondack    | Ethan Allen | Adirondack    | Ethan Allen | Adirondack     | Ethan Allen | New Service | Adirondack     | Ethan Allen |
| Montreal - Ft. Ticonderoga                    | 2,600         | 2,600       | 5,700         |             | 5,700          |             |             | 5,700          |             |
| Rutland                                       |               | 8,300       |               | 10,800      |                | 7,450       | 7,450       |                | 12,500      |
| Castleton                                     |               | 1,100       |               | 1,800       |                | 1,900       |             |                |             |
| Whitehall                                     | 450           | 450         | 500           | 500         | 1,000          |             |             | 1,000          |             |
| Fort Edward                                   | 2,150         | 2,150       | 2,300         | 2,300       | 1,500          | 1,500       | 1,500       | 3,100          |             |
| Saratoga Springs                              | 7,550         | 7,550       | 8,300         | 8,300       | 5,500          | 5,500       | 5,500       | 11,300         |             |
| Schenectady                                   | 4,050         | 4,050       | 4,200         | 4,200       | 3,500          | 3,400       | 3,400       | 4,600          | 4,600       |
| Manchester                                    |               |             |               |             |                |             | 4,400       |                | 4,400       |
| North Bennington                              |               |             |               |             |                |             | 6,400       |                | 6,400       |
| Mechanicville                                 |               |             |               |             |                |             | 4,600       |                | 4,600       |
| Albany/Rensselaer                             | 1,600         | 1,600       | 1,700         | 1,700       | 1,300          | 1,200       | 1,200       | 1,700          | 1,600       |
| Hudson - NY Penn                              | 16,200        | 16,200      | 17,950        | 17,950      | 17,400         | 17,350      | 17,350      | 22,400         | 20,200      |
| Total   | 34,600        | 44,000      | 40,650        | 47,550      | 35,900         | 38,300      | 51,800      | 49,800         | 54,300      |
| <b>Adirondack + Ethan Allen + New Service</b> | <b>78,600</b> |             | <b>88,200</b> |             | <b>126,000</b> |             |             | <b>104,100</b> |             |

The ridership within the study area was forecasted based on the methodology described above. Some post-processing was completed to reassign boardings for unlikely trip pairs – for instance while a trip from North Bennington to Castleton would be possible via rail, it would require a transfer and would be neither time nor cost effective. These types of trips were reassigned using professional judgment to nearby major transfer points (i.e. Rutland, Schenectady or Albany).

The ridership results indicate the following:

- A significant portion of the increase in boardings for the Build alternatives (41% for Alternative 1, and 97% for Alternative 2) is generated at the new stations at Manchester, North Bennington, and Mechanicville.
- Another significant portion of the increase in boardings for the Build alternatives is generated by trips to the New York City metro area; this result is expected since the New Service (or rerouted Ethan Allen) would improve access between Vermont’s Western Corridor and New York City.
- There is also a significant increase in boardings at Rutland station. This large increase is expected because Rutland is the terminal station and will provide access to a larger catchment area than the other stations in the Study Area. Providing the

option for travel through the Western Corridor is also expected to be attractive for passengers in both directions as it will provide a slightly shorter travel time.

- Differences in boardings between the two Build alternatives are primarily seen in those stations that will lose a frequency of service (Ft. Edward, Saratoga Springs), the model indicates that there is a mode shift for many of these “lost” trips.
- At both Schenectady and Rutland Stations a moderate number of additional boardings are anticipated for Alternative 1 vs. Alternative 2. The difference in boardings is greater at Schenectady Station because it is anticipated that many of the riders that currently use Castleton Station would instead access the system at Rutland Station under Alternative 2 – this behavior causes a “bump” in boardings at Rutland Station for Alternative 2.

### Projected Fare Revenue

Annual revenue was calculated in the ridership model for the year 2030. The ridership forecast procedure included use of a station-to-station trip matrix, with forecast ridership calculated for each pairing. Total fare revenues were calculated by multiplying the station-to-station trip matrix with the attendant station-to-station fare matrix. The forecasted revenue was prepared using current fares for existing station-to-station trips (as accessed on the Amtrak website) and developing a similar fare structure for the proposed new stations based on distance between origin and destination. **Table 7** shows the projected 2030 annual revenues as well as adjusted 2013 ticket revenue projections based on the Pro Forma revenues shown in the PRIIA 209 Cost Methodology that has been prepared for the Ethan Allen Service. The adjusted revenue estimates were calculated by factoring the 2030 projections to the actual ticket revenues from FY’2010-11 (as reported in the 209 Cost Methodology).

**Table 7 – Fare Revenue Forecasts**

| Revenue Forecasts | No Build    | Alternative 1 | Alternative 2 |
|-------------------|-------------|---------------|---------------|
| 2030 Revenue      | \$4,371,000 | \$6,566,000   | \$5,504,000   |
| 2013 Revenue      | \$2,839,000 | \$4,264,000   | \$3,574,000   |

**Table 8** provides the annual revenue forecast for each alternative for the years 2013 through 2017. Similar to the interim year ridership forecasts, the interim year revenue forecasts are based on a straight line extrapolation of the difference between the calculated 2010 and 2030 revenues.

**Table 8 – 2013 – 2017 Annual Fare Revenue Forecasts**

| Year | No Build     | Alternative 1 | Alternative 2 |
|------|--------------|---------------|---------------|
| 2013 | \$ 2,839,000 | \$ 6,565,600  | \$ 3,574,464  |
| 2014 | \$ 2,929,129 | \$ 6,700,976  | \$ 3,687,942  |
| 2015 | \$ 3,019,259 | \$ 6,836,351  | \$ 3,801,420  |
| 2016 | \$ 3,109,388 | \$ 6,971,727  | \$ 3,914,898  |
| 2017 | \$ 3,199,518 | \$ 7,107,102  | \$ 4,028,376  |






**Memorandum**

To: Costa Pappis, VTRANS

Date: March 29, 2012

Project No.: 11518.00

From: VHB

Re: NY-VT Final Capital Cost Estimate

The purpose of this memorandum is to present the revised capital cost estimates for the NY-VT Intercity Passenger Rail Study Area. There are two components to the capital cost estimates – costs for track improvements, and station costs. This document provides the following:

- A summary of the alternatives estimated and the segments used in this estimate.
- A description of the work defined for each alternative for each segment.
- A description of the unit costs and their development for use in this estimate.
- A summary capital cost estimate for each alternative.

## ALTERNATIVES ANALYZED & ANALYSIS SEGMENTS

Three alternatives were analyzed:

- 1) No Build Alternative
- 2) Alternative 1 – New Service to SW Vermont
- 3) Alternative 2 – Rerouted Ethan Allen Service

For both Build alternatives, service would be provided to Rutland via the “Western Corridor”; Alternative 1 retains the Ethan Allen service on its current alignment and adds a new service through southwest Vermont, while Alternative 2 reroutes the Ethan Allen through southwest Vermont. Both alternatives assume the routing from Albany to Mechanicville is via Schenectady. **Figures 1 and 2** below, illustrate the two Build alternatives.

Figure 1: Alternative 1

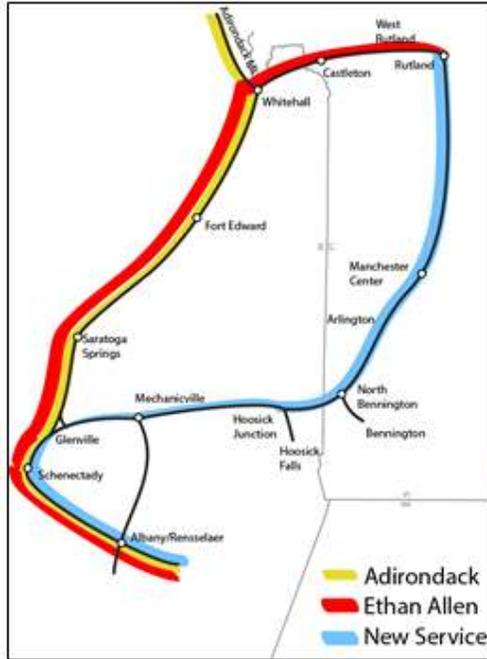
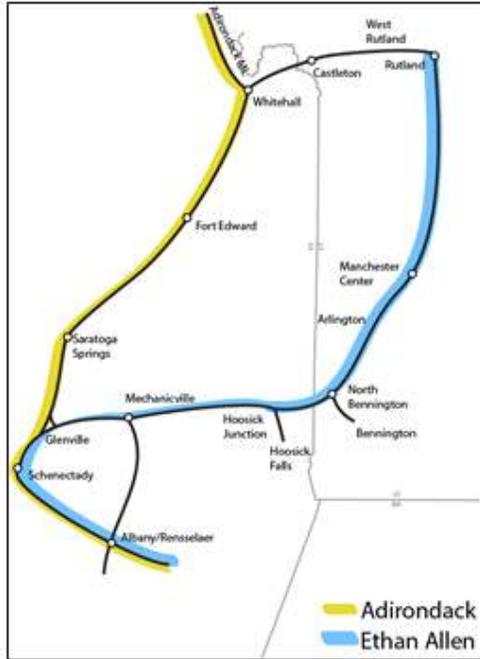


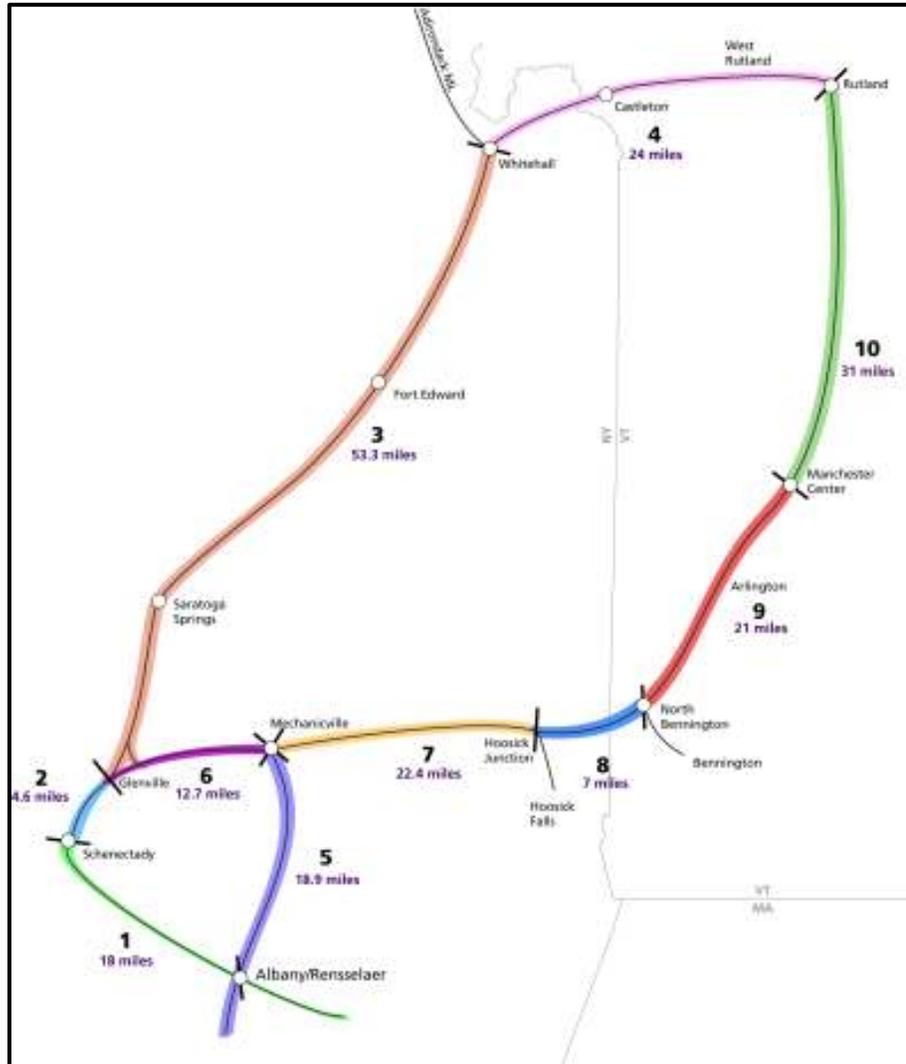
Figure 2: Alternative 2



To run the proposed new/rerouted service from Albany to Rutland via Schenectady and the Western Corridor (shown in blue in **Figures 1 and 2**), various infrastructure improvements are required to meet the targeted Maximum Allowable Speed (MAS) of 60MPH and provide sufficient capacity in the system to eliminate conflicts with the freight operations. Preliminary engineering has been completed to identify the necessary improvements for each alternative.

For the purposes of the preparing the capital cost estimate, the existing rail corridors in the project study area were divided into 10 segments, shown in **Figure 3**. Improvements are required for segments 2, 6, 8, 9 and 10 to accommodate the new or rerouted service through the Western Corridor of Vermont that are proposed in the Build Alternatives. The same capital improvements are required for Alternatives 1 and 2. **Table 1** provides a summary of the track improvements by segment. Segment 1 was not included in this table because it assumed no improvements on this segment are needed on both the signal and rail systems. Segment 5 was not included in the table because it has been eliminated from the study.

Figure 3: Segments Used in Cost Estimating





**Table 1: Track Improvements**

| # | Segment                              | Proposed Infrastructure Improvements  |
|---|--------------------------------------|---|
| 2 | Schenectady to CPF 480 (Glenville)   | <ul style="list-style-type: none"> <li>700' of new mainline for new alignment through CPF 480, all existing Public Grade crossings will require warning system modifications</li> <li>No track work required on existing mainline, 50' wide crossings assumed</li> <li>Signal system costs include electronic in-track signal system and interlocking tie-ins</li> <li>Aplaus Kill River Bridge needs upgrade to run double track; two turnouts at Aplaus Kill River Bridge will be retired</li> </ul>  |
| 6 | CPF 480 (Glenville) to Mechanicville | <ul style="list-style-type: none"> <li>2.5 miles of new sidings for congestion relief, all existing Public Grade crossings will require warning system modifications</li> <li>Signal system costs include electronic in-track signal system and interlocking tie-ins</li> <li>Two #20 crossovers, one #15 crossover, three #20 turnouts, and one #15 turnout needed; two turnouts to be retired</li> <li>Culvert at 1528+00 to be extended past proposed siding</li> </ul>  |
| 7 | Mechanicville to Hoosick             | <ul style="list-style-type: none"> <li>3 new sidings totaling 5.4 miles, existing 2 sidings need no work, 50' wide crossings assumed</li> <li>\$4M for updates to existing signal system, all existing Public Grade crossings will require warning system modifications</li> <li>8 new #20 turnouts needed for sidings</li> <li>800' of track needs to be realigned in order to fit #20 for station</li> <li>Grade crossing at Vial Ave will be made into double track to accommodate station siding at Mechanicville</li> <li>Bridge at Anthony's Kill (Bridge 186.93) requires a bridge extension/modification to facilitate second track</li> <li>A high platform passenger station in Mechanicville</li> </ul>  |
| 8 | Hoosick to North Bennington          | <ul style="list-style-type: none"> <li>Existing mainline is currently 100% welded rail (no rail upgrade needed), 50' wide crossings assumed</li> <li>Every 12th tie replaced, 50% of segment requires additional surfacing and aligning of curvature to meet increased speeds</li> <li>All existing Public Grade crossings will require warning system modifications</li> <li>1 mile of new siding required for congestion relief</li> <li>Two new #20 turnouts for new siding, existing bridge will require some work</li> <li>Culvert at 3143+00 needs to be extended past proposed siding</li> <li>3100' of new siding for station at North Bennington</li> <li>1350' of realigned track needed to allow space for siding inside the ROW</li> <li>Bridge costs included to rehabilitate or replace one (1) bridge identified as being in Poor condition based on inspections</li> <li>Two #20 turnouts needed for station siding</li> <li>Additional grade crossing for siding at Bank Street in North Bennington</li> <li>A high platform station in North Bennington including the historic station building and expanded parking</li> </ul> |

**Table 1: Track Improvements (Continued)**

| #  | Segment                              | Proposed Infrastructure Improvements  |
|----|--------------------------------------|---|
| 9  | North<br>Bennington to<br>Manchester | <ul style="list-style-type: none"> <li>Existing mainline is currently welded rail MP 2.0 - MP 13.4</li> <li>Existing mainline is currently Jointed 105# Rail MP13.4-MP16.0 &amp; MP 19.7- MP23.0 that requires upgrades and new welded rail</li> <li>Rail between MP16.0 to MP 19.7 is 115# 80' lengths that requires welding</li> <li>All existing Public Grade crossings will require warning system modifications, 50' wide crossings assumed</li> <li>Every 12th tie is replaced MP 2.0 -MP 13.4, 50% of segment requires additional surfacing and aligning of curvature to meet increased speeds</li> <li>Every 3rd tie is replaced MP13.4-MP 23.0, 50% of segment requires additional surfacing and aligning of curvature to meet increased speeds</li> <li>Bridge costs included to rehabilitate or replace three (3) bridges identified as being in Poor condition based on inspections</li> <li>VTR will allow increased passenger service without new signal system</li> <li>\$1M for new siding to accommodate high level platform station at Manchester</li> <li>1350' of realigned track needed to accommodate a 425' high level platform</li> <li>Relocation of private grade crossing Miles Lumber (MP 23.27) to accommodate siding</li> </ul> |
| 10 | Manchester to<br>Rutland             | <ul style="list-style-type: none"> <li>Existing mainline needs upgrading over entire length (30.4 miles of welded rail at 750k/mile)</li> <li>Shift track within railroad right-of-way in Manchester over length of 5,739'</li> <li>50' wide crossings assumed, all existing Public Grade crossings will require warning system modifications</li> <li>Every 3rd tie is replaced, 50% of segment requires additional surfacing and aligning of curvature to meet increased speeds</li> <li>Bridge costs included to rehabilitate or replace three (3) bridges identified as being in Poor condition based on inspections</li> <li>VTR will allow increased passenger service without new signal system</li> <li>Replace siding at MP 36.15 (601'), addition of siding for station 767' and addition of 3,000' siding</li> <li>2 turnouts needed for new siding, 1 turnout for replaced siding and 2 for station</li> <li>Siding entrance moved back 500' to avoid intersection at Brooklyn Road</li> <li>A high level platform station in Manchester</li> </ul>   |

## UNIT COSTS

The basic tool for pricing alternatives is the typical or “unit” cost by system element. The first task in developing unit costs is to prepare a list of work items or “library” of cost items included in the scope of work of this project. Each unit cost includes: labor, burden, construction equipment usage, materials, permanent equipment and contractor’s overhead and profit. The unit costs are then developed for each of the typical cross-sections anticipated for this project. The following elements were used to develop this estimate:

- New Mainline/
- Siding Track
- Upgrade Mainline Track
- Shift Mainline Track
- Stations
- Signal System Cost
- Grade Crossing - Public
- Grade Crossing - Private
- Grade Crossing - Warning System
- Grade Crossing Signage -All
- Undergrade Bridges
- Turnouts
- Turnouts to be Retired
- Clearing and Filling
- Culvert Extension

**Table 2** provides a brief description of each system elements and unit costs.

**Table 2: Unit Costs**

| <b>System Element</b>           | <b>Description</b>   | <b>Unit Cost</b>               |
|---------------------------------|--|--------------------------------|
| New Mainline/Siding Track       | New wood tie track construction, 115# CWR with new plates and resilient fasteners.   | \$200/TF                       |
| Upgrade Mainline Track          | Spot tie replacements as required per track condition, 115# CWR with new plates and resilient fasteners.   | Varies                         |
| Shift Mainline Track            | Mainline track that requires realignment and shifting to meet the increased speeds and proposed alignment configurations.  | \$150/TF                       |
| Stations                        | The cost estimate for each station was developed individually to reflect the varying conditions of each station location. Stations include a high level (48") platform of 425' by 15' with stairs and an access ramp to meet ADA requirements. | Varies – See <b>Tables 3-5</b> |
| Signal System Cost              | Cost of providing a basic signal system to support the desired passenger train speeds.   | Lump Sum                       |
| Grade Crossing – Public         | Installation/replacement of the track panel through the crossing and the associated typical roadway paving work.   | \$3,000/ TF                    |
| Grade Crossing – Private        | Installation/replacement of a timber plank crossing for private use.   | \$5,000 EA                     |
| Grade Crossing - Warning System | Installation and upgrade of the signal system to accommodate the increased passenger train speeds.   | \$300,000 EA                   |
| Grade Crossing Signage - All    | Installation of all required crossing warning signage.   | \$5,000 EA                     |
| Undergrade Bridges              | Structural repairs to bridges listed as in "poor" condition required for passenger trains. All bridges not listed as "poor" we assumed to need no work.  | \$500,000 EA                   |
| Turnouts                        | Addition of new turnouts required to support operational needs.  | Varies by type.                |
| Turnouts to be retired          | Removal of turnouts.   | \$70,000 EA                    |
| Clearing and Filling            | Clearing and grubbing, required fill slopes for track alignment, potential ditching.   | Lump Sum                       |
| Culvert Extension               | Extension of culverts to support the additional siding tracks or relocated track alignment.  | Lump Sum                       |

**Table 3** shows the total costs by major system elements and **Table 4** shows the cost breakdown by analysis segment.

**Table 3: Total Costs, by Major System Element**

| System Element        |               |             |              |               |                   |                       | Total <sup>1</sup> |
|-----------------------|---------------|-------------|--------------|---------------|-------------------|-----------------------|--------------------|
| Mainline Improvements | Crossings     | Stations    | Bridges      | Signal System | Special Trackwork | Clearing and Drainage |                    |
| \$ 55,730,050         | \$ 23,110,000 | \$5,290,000 | \$ 4,500,000 | \$ 16,000,000 | \$6,035,000       | \$ 1,579,060          | \$ \$112,244,110   |

1. Costs include: labor, burden, construction equipment usage, materials, station site acquisition, permanent equipment and contractor's overhead and profit. Does not include contingency allowances.

**Table 4: Total, Costs, by Analysis Segment**

|  | New Siding Track |             | Upgrade Mainline Track |                           | Shift Mainline Track |             | Signal System | Grade Crossing - Public |             | Grade Crossing - Private |           | Grade Crossing - Warning System |             | Grade Crossing Signage -All |           | Undergrade Bridges |             | Turnouts/Turnout Removal |             | Clearing & Filling | Culvert Extension | Stations    | Total <sup>1</sup> |              |
|--|------------------|-------------|------------------------|---------------------------|----------------------|-------------|---------------|-------------------------|-------------|--------------------------|-----------|---------------------------------|-------------|-----------------------------|-----------|--------------------|-------------|--------------------------|-------------|--------------------|-------------------|-------------|--------------------|--------------|
|  | \$200            | TF          | Varies                 | TF                        | \$150                | TF          | LS            | \$3,000                 | TF          | \$5,000                  | EA        | \$150,000                       | EA          | \$5,000                     | LS        | \$500,000          | EA          | Quant                    | Cost        | Cost               | Cost              | Cost        |                    |              |
|  | Quant            | Cost        | Quant.                 | Cost                      | Quant                | Cost        |               | Quant                   | Cost        | Quant                    | Cost      | Quant                           | Cost        | Quant                       | Cost      | Quant.             | Cost        |                          |             |                    |                   |             |                    |              |
| Segment 1 - CSX (Schenectady-Albany)       | 0                | \$0         | 0                      | \$0                       | 0                    | \$0         | \$0           | 0                       | \$0         | 0                        | \$0       | 0                               | \$0         | 0                           | \$0       | 0                  | \$0         | 0                        | \$0         | \$0                | \$0               | \$0         | \$0                | \$0          |
| Segment 2 - CPR (CPF 480-Schenectady)      | 700              | \$140,000   | 0                      | \$0                       | 1,000                | \$150,000   | \$4,000,000   | 200                     | \$600,000   | 0                        | \$0       | 4                               | \$600,000   | 4                           | \$20,000  | 1                  | \$500,000   | 0/2                      | \$140,000   | \$0                | \$0               | \$0         | \$0                | \$6,150,000  |
| Segment 6 - CPR (Mechanicville-CPF 480)    | 13,200           | \$2,640,000 | 0                      | \$0                       | 7,000                | \$1,050,000 | \$8,000,000   | 400                     | \$1,200,000 | 5                        | \$25,000  | 8                               | \$1,200,000 | 13                          | \$65,000  | 0                  | \$0         | 10/2                     | \$2,370,000 | \$431,500          | \$25,000          | \$1,550,000 | \$0                | \$18,556,500 |
| Segment 7 - PAR (Hoosick-Mechanicville)    | 28,500           | \$5,700,000 | 0                      | \$0                       | 800                  | \$120,000   | \$4,000,000   | 600                     | \$1,800,000 | 4                        | \$20,000  | 12                              | \$1,800,000 | 16                          | \$80,000  | 1                  | \$500,000   | 8/0                      | \$1,880,000 | \$877,800          | \$0               | \$0         | \$0                | \$16,777,800 |
| Segment 8 - VTR (No. Bennington-Hoosick)   | 8,100            | \$1,620,000 | 9,240                  | \$554,400 <sup>1</sup>    | 1,350                | \$202,500   | \$0           | 200                     | \$600,000   | 2                        | \$10,000  | 4                               | \$600,000   | 6                           | \$30,000  | 1                  | \$500,000   | 4/0                      | \$940,000   | \$219,760          | \$25,000          | \$2,290,000 | \$0                | \$7,591,660  |
| Segment 9 - VTR (Manchester-N. Bennington) | 0                | \$0         | 110,880                | \$8,995,400 <sup>2</sup>  | 1,350                | \$202,500   | \$0           | 1,000                   | \$3,000,000 | 26                       | \$280,000 | 20                              | \$3,000,000 | 46                          | \$230,000 | 3                  | \$1,500,000 | 0                        | \$0         | \$0                | \$0               | \$0         | \$0                | \$17,207,900 |
| Segment 10 - VTR (Rutland-Manchester)      | 4,368            | \$873,600   | 163,680                | \$32,620,800 <sup>3</sup> | 5,739                | \$860,850   | \$0           | 1,200                   | \$3,600,000 | 63                       | \$315,000 | 24                              | \$3,600,000 | 87                          | \$435,000 | 3                  | \$1,500,000 | 3/0                      | \$705,000   | \$0                | \$0               | \$1,450,000 | \$0                | \$45,960,250 |

1 – Unit price = \$15/TF (track foot)

2 – Unit price = \$30/TF. Includes \$244,000 for new welds, and \$4,425,000 for 5.9 miles of welded rail.

3 – Unit price= \$60/TF. Includes \$22,800,000 for 30.4 miles of new welded rail.



## Station Costs

New stations are proposed to be constructed in Mechanicville, North Bennington, and Manchester for both Build alternatives. All stations will be full length (425') high level platform stations to comply with ADA requirements.

The general development plan for each station calls for a Class V station that includes:

- Platform for ingress/egress access to trains;
- Parking lot with 50 spaces;
- Auto pick-up/drop-off area; and
- Sheltered Waiting Area.

**Tables 5 through 7** provide a breakdown of the station cost estimates for each station location – the total station costs are included in **Tables 3 and 4**.

**Table 5: Mechanicville Station Cost Estimate**

| Area Calculations                     |              |           |          |                    |
|---------------------------------------|--------------|-----------|----------|--------------------|
| Hot Mix Asphalt (driveway/parking)    | 25210        | SF        |          |                    |
| Cement Concrete Sidewalk              | 6650         | SF        |          |                    |
| Loam & Seed / Landscaping             | 4130         | SF        |          |                    |
| Platform (425-ft) / stairs / ramps    | 6375         | SF        |          |                    |
| <b>TOTAL AREA</b>                     | <b>42030</b> | <b>SF</b> |          |                    |
| Cost Estimate                         |              |           |          |                    |
|                                       | Unit Costs   | Unit      | Quantity | Cost               |
| Property Acquisition (60,000SF)       | \$100,000    | LS        | 1        | \$100,000          |
| Excavation (assume 1-ft cut)          | \$30         | CY        | 1557     | \$46,710           |
| Grading & Compacting                  | \$5          | SY        | 4670     | \$23,350           |
| Gravel Borrow (pavement & sidewalks)  | \$35         | CY        | 787      | \$27,545           |
| Crushed Stone                         | \$60         | CY        | 311      | \$18,660           |
| Hot Mix Asphalt Pavement (3.5" thick) | \$120        | TON       | 549      | \$65,880           |
| Cement Concrete                       | \$60         | SY        | 739      | \$44,340           |
| Loam Borrow (4" thick)                | \$50         | CY        | 51       | \$2,550            |
| Seeding                               | \$5          | SY        | 459      | \$2,295            |
| Landscaping (12 trees & shrubs)       | \$8,000      | LS        | 1        | \$8,000            |
| Curbing                               | \$40         | FT        | 1560     | \$62,400           |
| Drainage                              | \$50,000     | LS        | 1        | \$50,000           |
| Parking Area Lighting                 | \$50,000     | LS        | 1        | \$50,000           |
| Station Signage                       | \$40,000     | LS        | 1        | \$40,000           |
| Highway Signage                       | \$5,000      | LS        | 1        | \$5,000            |
| Platform                              |              |           |          |                    |
| High Level Platform                   | \$140        | SF        | 6375     | \$892,500          |
| Platform Lighting                     | \$75,000     | LS        | 1        | \$75,000           |
| Shelter Structure                     | \$30,000     | LS        | 1        | \$30,000           |
| <b>TOTAL COST</b>                     |              |           |          | <b>\$1,544,230</b> |
| <b>TOTAL COST (rounded)</b>           |              |           |          | <b>\$1,550,000</b> |

**Table 6: North Bennington Station Cost Estimate**

| Area Calculations                            |            |      |          |                    |
|--|------------|------|----------|--------------------|
| Hot Mix Asphalt (driveway/parking)           | 27210      | SF   |          |                    |
| Cement Concrete Sidewalk                     | 8430       | SF   |          |                    |
| Loam & Seed / Landscaping                    | 6490       | SF   |          |                    |
| Platform (425-ft) / stairs / ramps           | 6375       | SF   |          |                    |
| TOTAL AREA                                   | 48170      | SF   |          |                    |
| Cost Estimate                                |            |      |          |                    |
|  | Unit Costs | Unit | Quantity | Cost               |
| Property Acquisition (100,000SF)             | \$500,000  | LS   | 1        | \$500,000          |
| Excavation (assume 1-ft cut)                 | \$30       | CY   | 1784     | \$53,520           |
| Grading & Compacting                         | \$5        | SY   | 5352     | \$26,760           |
| Gravel Borrow (pavement & sidewalks)         | \$35       | CY   | 880      | \$30,800           |
| Crushed Stone                                | \$60       | CY   | 336      | \$20,160           |
| Hot Mix Asphalt Pavement (3.5" thick)        | \$120      | TON  | 593      | \$71,160           |
| Cement Concrete                              | \$60       | SY   | 937      | \$56,200           |
| Loam Borrow (4" thick)                       | \$50       | CY   | 80       | \$4,000            |
| Seeding                                      | \$5        | SY   | 721      | \$3,605            |
| Landscaping (12 trees & shrubs)              | \$8,000    | LS   | 1        | \$8,000            |
| Curbing                                      | \$40       | FT   | 1750     | \$70,000           |
| Drainage                                     | \$50,000   | LS   | 1        | \$50,000           |
| Parking Area Lighting                        | \$50,000   | LS   | 1        | \$50,000           |
| Station Signage                              | \$40,000   | LS   | 1        | \$40,000           |
| Highway Signage                              | \$5,000    | LS   | 1        | \$5,000            |
| Platform                                     |            |      |          |                    |
| High Level Platform                          | \$140      | SF   | 6375     | \$892,500          |
| Platform Lighting                            | \$75,000   | LS   | 1        | \$75,000           |
| Shelter Structure                            | \$30,000   | LS   | 1        | \$30,000           |
| Allowance for Historic N. Bennington Station |            |      |          | \$300,000          |
| <b>TOTAL COST</b>                            |            |      |          | <b>\$2,286,725</b> |
| <b>TOTAL COST (rounded)</b>                  |            |      |          | <b>\$2,290,000</b> |

**Table 7: Manchester Station Cost Estimate**

| <b>Area Calculations</b>              |                   |             |                 |                    |
|---------------------------------------|-------------------|-------------|-----------------|--------------------|
| Hot Mix Asphalt (driveway/parking)    | 26760             | SF          |                 |                    |
| Cement Concrete Sidewalk              | 5450              | SF          |                 |                    |
| Loam & Seed / Landscaping             | 3800              | SF          |                 |                    |
| Platform (425-ft) / stairs / ramps    | 6375              | SF          |                 |                    |
| <b>TOTAL AREA</b>                     | <b>42050</b>      | <b>SF</b>   |                 |                    |
| <b>Cost Estimate</b>                  |                   |             |                 |                    |
|                                       | <b>Unit Costs</b> | <b>Unit</b> | <b>Quantity</b> | <b>Cost</b>        |
| Excavation (assume 1-ft cut)          | \$30              | CY          | 1557            | \$46,710           |
| Grading & Compacting                  | \$5               | SY          | 4672            | \$23,360           |
| Gravel Borrow (pavement & sidewalks)  | \$35              | CY          | 795             | \$27,825           |
| Crushed Stone                         | \$60              | CY          | 330             | \$19,800           |
| Hot Mix Asphalt Pavement (3.5" thick) | \$120             | TON         | 583             | \$69,960           |
| Cement Concrete                       | \$60              | SY          | 606             | \$36,360           |
| Loam Borrow (4" thick)                | \$50              | CY          | 47              | \$2,350            |
| Seeding                               | \$5               | SY          | 422             | \$2,110            |
| Landscaping (12 trees & shrubs)       | \$8,000           | LS          | 1               | \$8,000            |
| Curbing                               | \$40              | FT          | 1650            | \$66,000           |
| Drainage                              | \$50,000          | LS          | 1               | \$50,000           |
| Parking Area Lighting                 | \$50,000          | LS          | 1               | \$50,000           |
| Station Signage                       | \$40,000          | LS          | 1               | \$40,000           |
| Highway Signage                       | \$5,000           | LS          | 1               | \$5,000            |
| Platform                              |                   |             |                 |                    |
| High Level Platform                   | \$140             | SF          | 6375            | \$892,500          |
| Platform Lighting                     | \$75,000          | LS          | 1               | \$75,000           |
| Shelter Structure                     | \$30,000          | LS          | 1               | \$30,000           |
| <b>TOTAL COST</b>                     |                   |             |                 | <b>\$1,444,975</b> |
| <b>TOTAL COST (rounded)</b>           |                   |             |                 | <b>\$1,450,000</b> |









**Memorandum**

To: Costa Pappis, VTRANS

Date: October 4, 2012

Project No.: 11518.00

From: VHB

Re: NY-VT New Station Locations

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The purpose of this memorandum is to present the results of the station siting analysis completed for the NY-VT Intercity Passenger Rail Study.

Three new stations are proposed in conjunction with both Build alternatives, in the following locations:

- 1) Mechanicville, NY
- 2) North Bennington, VT
- 3) Manchester, VT

Each of the three stations would serve passengers using the service that travels between Albany, NY and Rutland, VT via the "Western Corridor.

The general development plan for each station calls for a Class V station that will include:

- Platform for ingress/egress access to trains;
- Parking lot with 50 spaces;
- Auto pick-up/drop-off area; and
- Sheltered Waiting Area.

Factors considered during the station siting included:

- Proximity to town centers;
- Passenger/vehicular access to and from the site;
- Potential environmental restrictions;
- Presence of sufficient tangent track to accommodate trains (both passenger and freight); and
- Availability of land/need to purchase property.

Under Title II of the Americans with Disabilities Act (ADA) intercity rail systems which are owned or operated by public entities must be made readily accessible to and useable by individuals with disabilities, including those who use wheelchairs. With respect to public entities, Title II requires that rail cars be coordinated with boarding platforms to provide level boarding for all train cars. The term "level boarding" means direct access between the platform and any car of the train without any change in level.

Level boarding is identified as the best means of providing accessibility and benefits to all passengers, and has been deemed to be operationally superior to deploying boarding devices such as lifts, ramps or bridge plates. Current legislation recommends full length platforms over mini-high platforms because mini-high platforms can accommodate only a limited number of passengers, can serve only

one car at a time, and may restrict normal passenger flow. New or modified stations must be designed and constructed such that level boarding is feasible from the platforms; this generally means that high level platforms are required. Additionally, the length of tangent track (or nearly tangent track – degree of curvature must be 2 degrees or less) adjacent to the platform must be sufficient to allow the passenger trains to enter the station area (without clipping the edge of the platform) and be parallel to the platform in order to allow ingress and egress from the train.

There are currently freight operations on all sections of track associated with proposed route from Albany to Rutland (via the Western Corridor of Vermont). Because freight vehicles have larger clearance requirements than passenger trains, with respect to platform setbacks from the track, either gauntlet tracks (which place a set of tracks straddling one of the mainline tracks) or a siding may be needed in some locations to achieve the required offset from the mainline. Freight operators in the Study Area have indicated they want to preserve the ability to run wide loads, so the gauntlet track or sidings provide a way to shift the wide load trains away from the platform edge.

Graphics are attached that summarize the sites that were identified and analyzed in conjunction with each of the stations. For each station, there is a summary graphic showing each of the alternative station locations that include brief notes regarding the benefits or disadvantages of each site; example site layouts (in each of the town center site alternatives) are also attached.

Station Costs

A number of variations have been analyzed at each station and cost estimates prepared for each variation:

- Both high level (to conform with ADA level boarding requirements) and low level platform<sup>1</sup> stations have been analyzed for each station location;
- Platform length was also analyzed as a variable – 340-foot platforms (to accommodate 4-car trains) and 425-foot platforms (to accommodate 5-car trains).

**Table 2** summarizes the station cost estimates for each variation at each station location.

**Table 2 – Station Cost Estimates**

| Station          | Cost Estimate             |                            |                           |                            |
|------------------|---------------------------|----------------------------|---------------------------|----------------------------|
|                  | Low Level Platform (340') | High Level Platform (340') | Low Level Platform (425') | High Level Platform (425') |
| Mechanicville    | \$860,000                 | \$1,260,000                | \$930,000                 | \$1,400,000                |
| North Bennington | \$890,000                 | \$1,290,000                | \$970,000                 | \$1,440,000                |
| Manchester       | \$860,000                 | \$1,260,000                | \$930,000                 | \$1,400,000                |
| <b>TOTAL</b>     | <b>\$2,610,000</b>        | <b>\$3,810,000</b>         | <b>\$2,830,000</b>        | <b>\$4,240,000</b>         |

Note: A 340-foot can accommodate 4-car train; a 425-foot platform can accommodate a 5-car train.

<sup>1</sup> The state may pursue a waiver from level boarding requirements (though the forecasted ridership at the proposed new stations indicates they will surpass the threshold over which high platforms are required) and pursue low platform stations; therefore estimated capital costs were prepared for both low and high platform stations.

Mechanicville Station Location Alternatives

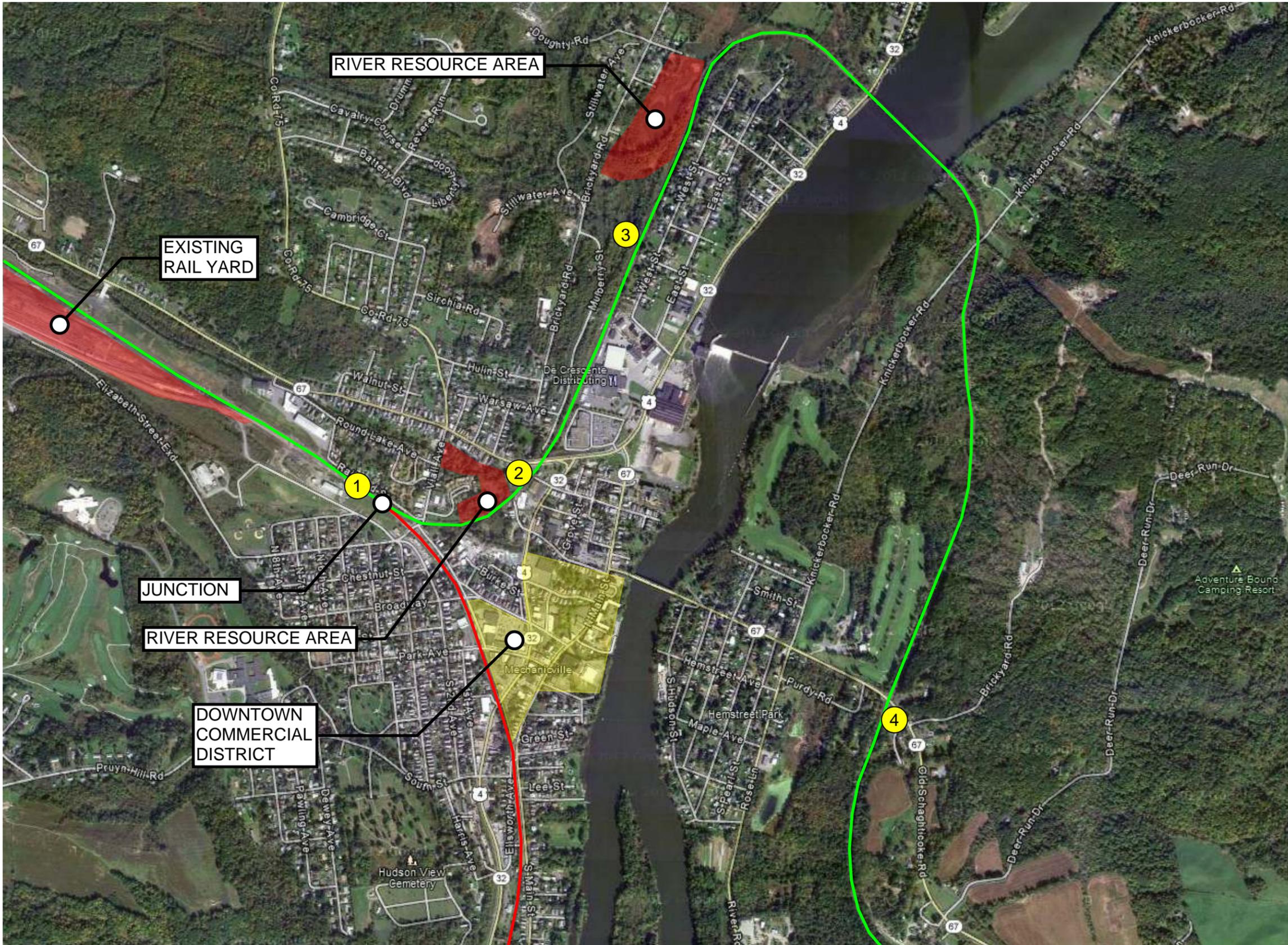


Image Source: Google Maps

Mechanicville Station

Mechanicville, NY

Class V Station

- 425' High-Level Platform
- Sheltered Waiting Area
- 50 Parking Spaces
- Auto pick-up/Drop-off Station/Highway Signage

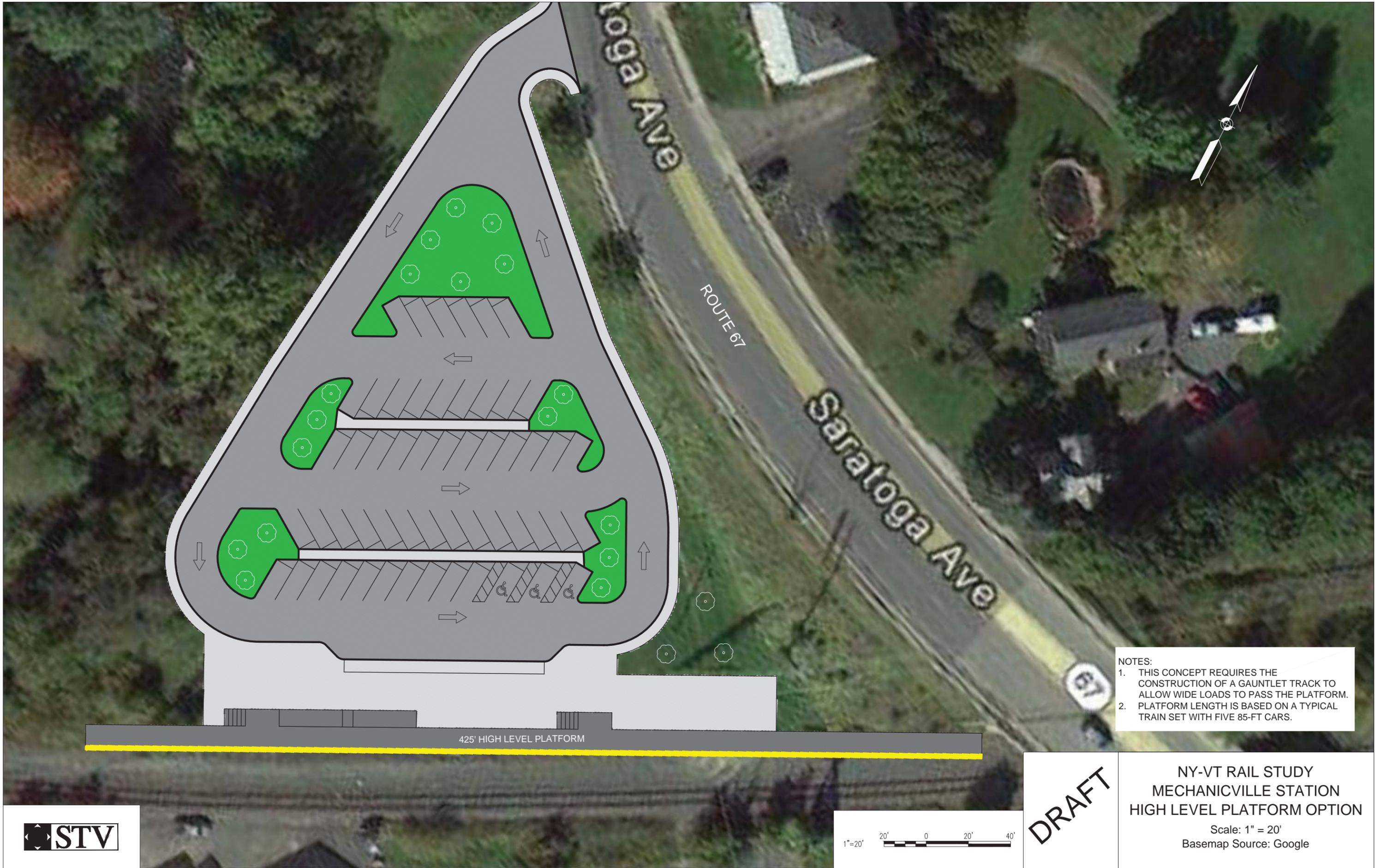
Key:

- ① -Historic station site.  
-Location between rail yard and junction risks operational problems.
- ② -Excellent access to downtown via Route 67  
-Requires track realignment to accommodate high-level platform  
-Possible environmental constraints.
- ③ -Tangent track accommodates high-level platform.  
-Poor roadway access.  
-Residential land use.  
-Possible environmental constraints.
- ④ -Excellent access to downtown via Route 67.  
-Tangent track accommodates high-level platform  
-Room for parking.

Legend:

- NY-VT Rail Route
- Other Rail Lines
- ① Investigated Station Location





NOTES:  
 1. THIS CONCEPT REQUIRES THE CONSTRUCTION OF A GAUNTLET TRACK TO ALLOW WIDE LOADS TO PASS THE PLATFORM.  
 2. PLATFORM LENGTH IS BASED ON A TYPICAL TRAIN SET WITH FIVE 85-FT CARS.



**DRAFT**

**NY-VT RAIL STUDY  
 MECHANICVILLE STATION  
 HIGH LEVEL PLATFORM OPTION**  
 Scale: 1" = 20'  
 Basemap Source: Google



North Bennington Station Location Alternatives

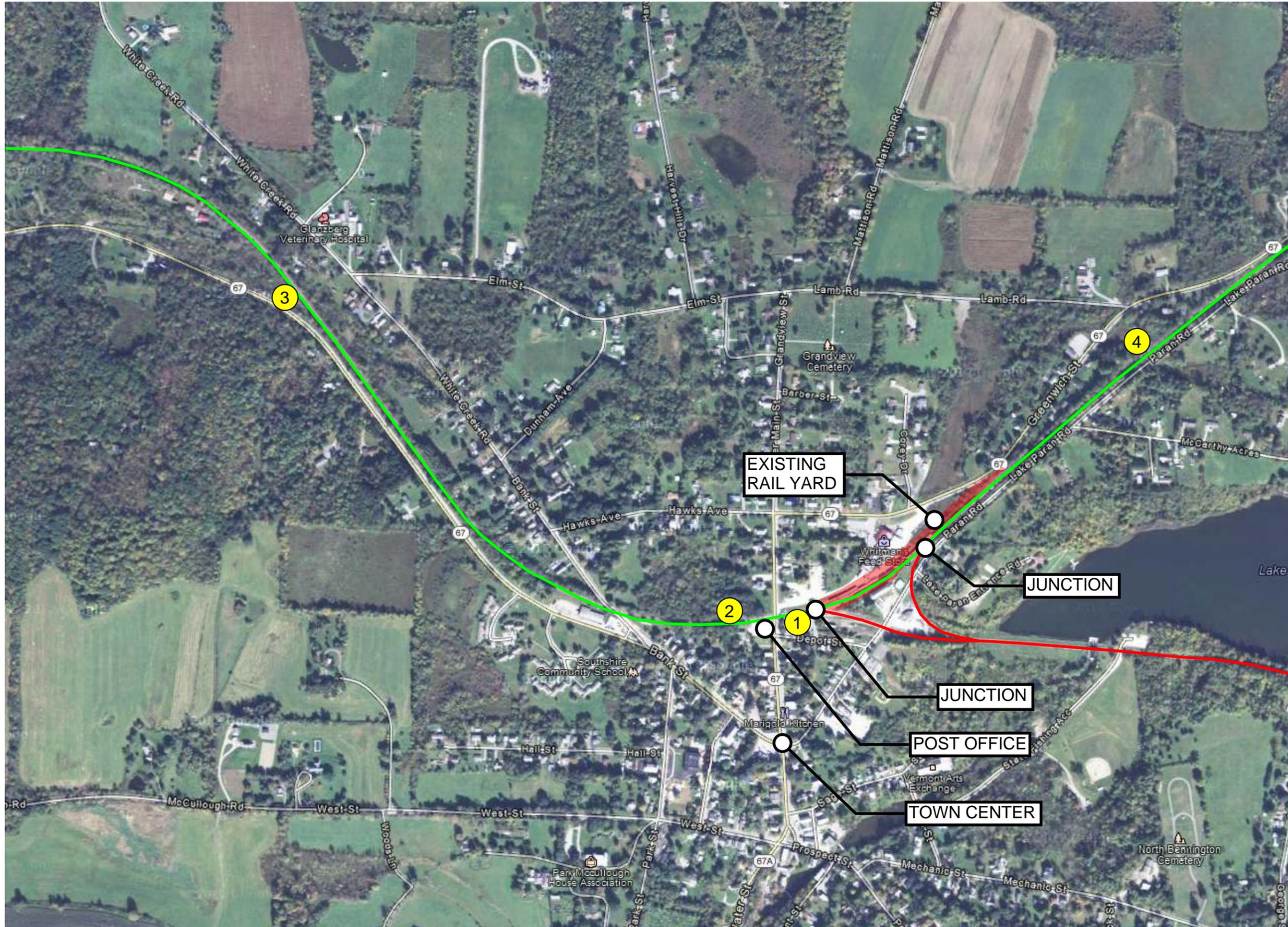


Image Source: Google Maps

North Bennington Station

North Bennington, VT

Class V Station

- 425' High-Level Platform
- Sheltered Waiting Area
- 50 Parking Spaces
- Auto pick-up/Drop-off Station/Highway Signage

Key:

- ① -Historic station location.  
-Currently occupied.  
-Location at junction and rail yard poses operational problems.  
-Insufficient room for platform.  
-Curved track precludes high-level platform.
- ② -Adjacent to historic station and town center.  
-Track realignment, land takings, and grade crossing reconstruction required to accommodate high-level platform.  
-Parking lot to be located across tracks at post office.
- ③ -Tangent track alignment accommodates high-level platform.  
-Good vehicular access.  
-Room for parking adjacent to platform.
- ④ -Equivalent to site 3 but in a residential area with less direct site access.

Legend:

- NY-VT Rail Route
- Other Rail Lines
- ① Investigated Station Location





REALIGNED TRACK

425' HIGH LEVEL PLATFORM

ADA-COMPLIANT ACCESSIBLE ROUTE FROM HISTORIC STATION

POST OFFICE

BUCKLEY ROAD

MAIN STREET

4-QUADRANT GATE

HISTORIC STATION BUILDING AND PARKING TO BE REUSED

ADDITIONAL LONG-TERM PARKING

NOTES:

- 1. PLATFORM LENGTH IS BASED ON A TYPICAL TRAIN SET WITH FIVE 85-FT CARS.
- 2. UPGRADES TO THE EXISTING STATION BUILDING MAY BE REQUIRED TO COMPLY WITH ADA GUIDELINES.



DRAFT

NY-VT RAIL STUDY  
NORTH BENNINGTON STATION  
LOW LEVEL PLATFORM OPTION

Scale: 1" = 40'  
Basemap Source: Bing Maps



Manchester Station Location Alternatives

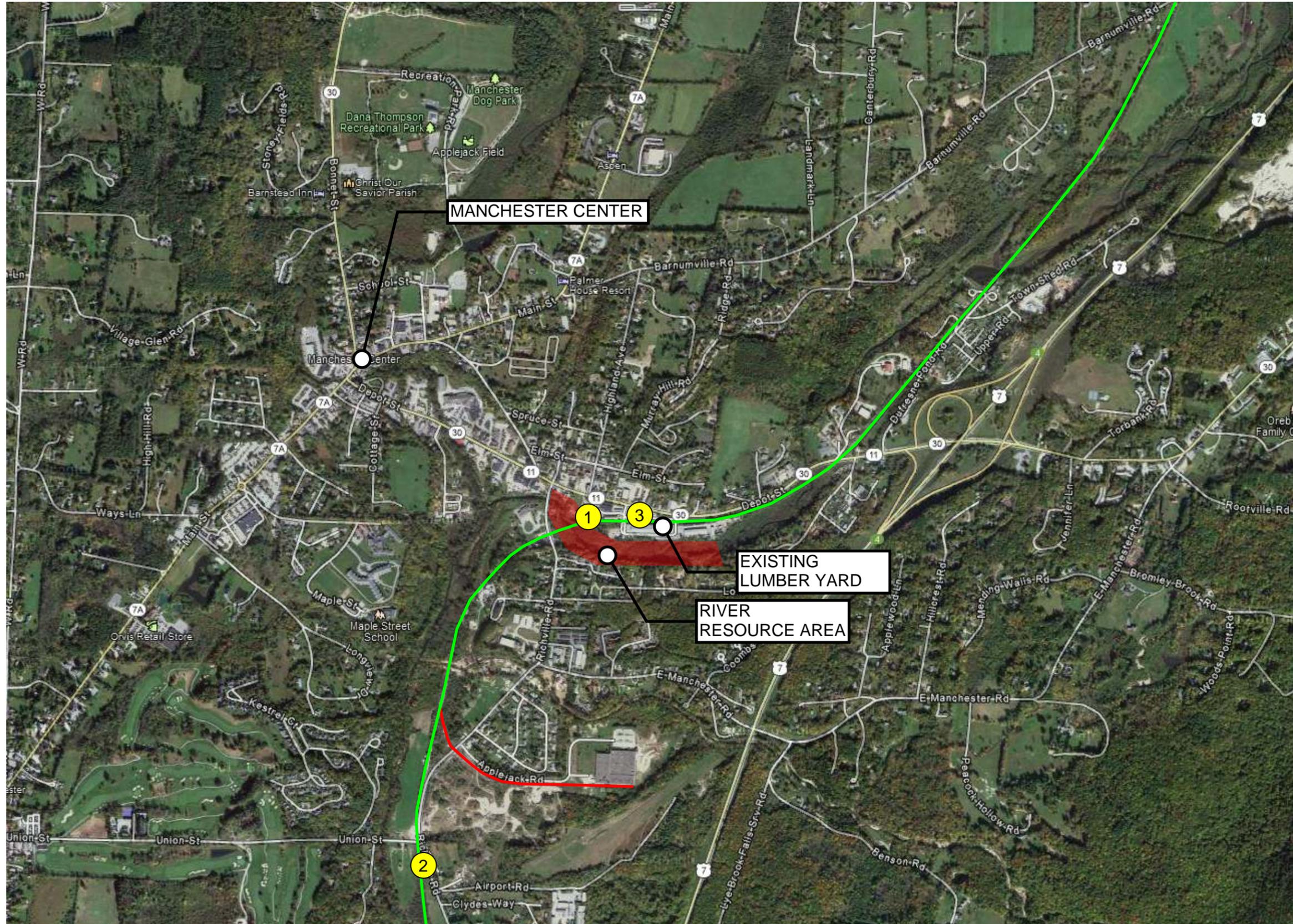


Image Source: Google Maps

**Manchester Station**

Manchester, VT

**Class V Station**

- 425' High-Level Platform
- Sheltered Waiting Area
- 50 Parking Spaces
- Auto pick-up/Drop-off
- Station/Highway Signage

**Key:**

- 1** -Historic station location.  
-Curved track precludes high-level platform.  
-Potential environmental restrictions
- 2** -Tangent track accommodates high-level platform.  
-Direct vehicular access.  
-Adequate room for parking  
-Does not displace existing buildings.
- 3** -Tangent track alignment accommodates high-level platform.  
-Central location in Manchester.  
-Excellent site access.  
-Requires acquisition of buildings.  
-Eliminates rail siding

**Legend:**

- NY-VT Rail Route
- Other Rail Lines
- 1** Investigated Station Location

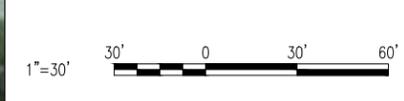




DEPOT STREET

425' HIGH LEVEL PLATFORM

- NOTES:
1. THIS CONCEPT REQUIRES MINOR TRACK REALIGNMENT AND THE CONSTRUCTION OF A GAUNTLET TRACK TO ALLOW WIDE LOADS TO PASS THE PLATFORM.
  2. PLATFORM LENGTH IS BASED ON A TYPICAL TRAIN SET WITH FIVE 85-FT CARS.



**DRAFT**

**NY-VT RAIL STUDY  
MANCHESTER STATION  
HIGH LEVEL PLATFORM OPTION**

Scale: 1" = 30'  
Basemap Source: Google



# C

## Simulation Model Summary



**Memorandum**

To: Costa Pappas

Date: September 19, 2012

Project No.: 11518.00

From: Mike Lambert  
Anthony Waller  
Josh Bendyk

Re: Summary of Simulation Assumptions and  
TPC Results

---

This memo summarizes the information used and assumptions made to build the Rail Traffic Controller™ (RTC) model for the NY-VT Bi-State Intercity Passenger Rail Study.

The infrastructure used in the model was prepared conceptually by the VHB team specifically to run the software model's Train Performance Calculator (TPC). The TPC runs are single train simulations without conflicts based on the route and stopping pattern input for each train. In the simulation model, TPC runs were completed for one northbound and a southbound train between Albany and Rutland along the proposed route.

The preferred route, modeled in RTC, is from Albany/ Rensselaer NY to Rutland VT; containing four segments each owned by a different railroad. The model includes proposed improvements along each segment of the corridor. The following paragraphs summarize the information and assumptions used to build each railroad segment of the model's database.

***CSX (With Amtrak as Lessor) – Albany/Rensselaer to Schenectady***

In the RTC model, this segment was coded based on the infrastructure proposed for two committed, Amtrak-managed capital projects: the Albany/ Rensselaer Station 4<sup>th</sup> Track Project (including an additional high-level platform at that location) and the Albany–Schenectady Double Track Project (including upgraded speeds). Plans prepared by the VHB team included all the information needed for track and signal infrastructure locations, switch and crossover information, speeds, grades, and signal aspects.

***CP – Schenectady to Mechanicville***

In the RTC model, this segment was coded based on track charts of the Freight Main Subdivision provided by CP. The track charts included the track and signal infrastructure, speed, and grade information. However, they did not include stationing for the infrastructure locations or changes in speed or grade. For the model, as directed by CP, these locations were estimated based on the mileposts on the track chart and measurements in Google Earth.

The track charts also did not include information on switches or crossovers. As directed by CP, for the purposes of the RTC model switch numbers and types were assumed to be the following:

- Main line switches were set as #15 dual control power switches,

- Turnout switches for industrial tracks or yard leads off a main track were set as #10 manual switches with electric locks, and
- Switches for yard tracks were set as #10 manual switches without locks.

No signal aspects were provided for this segment of track. As directed by CP, signal aspects and the trailing signal settings were generated and assumed for the purposes of the RTC Model. The aspects were based on the signal aspect definitions included in the CP timetable, as well as track speed and geometry. Tables (Attachment 2) developed by the VHB team included stationing for curves with recommendations for track speeds at those points. These speeds were input to the model at the appropriate locations. A Maximum Authorized Speed (MAS) of 70 mph was assumed on straight track segments between speed restrictions throughout this segment.

CP has also provided a schematic of the newly installed Mechanicville Yard track infrastructure. This schematic provides the interlocking switch and crossover numbers, but does not include stationed locations of the interlocking track infrastructure or signal infrastructure information. For the model, as directed by CP, these locations were estimated based on the mileposts on the track chart and measurements in Google Earth.

The model also includes proposed changes to the infrastructure derived from track drawings developed by the VHB team as part of this project. These changes involve enhancements to the interlockings that are northeast of Mohawk Yard, namely CP477 and CP478. This involves the installation of additional crossovers, the relocation of other crossovers, and the removal of certain track segments affected by this work. The effect of the new alignment of the infrastructure results in greater capability for parallel moves.

#### ***Pan Am – Mechanicville to Hoosick Jct.***

In the RTC model, this segment was built based on the track charts of the Freight Main Line provided by Pan Am. The track charts included the track and signal infrastructure, speed, and grade information; however they did not include stationing for the infrastructure locations or changes in speed or grade. For the model, these locations were estimated based on the mileposts on the track charts and measurements in Google Earth.

The track charts also did not include information on switches or crossovers. For the purposes of the RTC model switch numbers and types were assumed to be the following:

- Main line switches were set as #15 dual control power switches,
- Turnout switches for industrial tracks or yard leads off a main track were set as #10 manual switches with electric locks, and
- Switches for yard tracks were set as #10 manual switches without locks.

No signal aspects were provided for this segment of track. Signal aspects and the trailing signal settings were assumed for the purposes of the RTC Model. The aspects were based on the signal aspect definitions included in the Pan Am timetable, as well as track speed and geometry. Tables (Attachment 2) developed by the VHB team included stationing for curves with recommendations for track speeds at those points. These speeds were input to the model at the appropriate locations. An MAS of 60 mph was assumed on straight track segments between speed restrictions throughout this segment.

The model also includes proposed changes to the infrastructure derived from track drawings developed by the VHB team, including the following three proposed control sidings.

- A 8,000 foot siding located approximately 1.5 miles east of CP478,
- a 8,000 foot siding located approximately 4 miles east of Mechanicville, and
- a 10,000 foot siding located approximately 1.5 miles west of Hoosick Junction (CPF448).

The RTC model does not include the track and infrastructure changes being constructed as part of one committed project, the joint Pan Am/ Norfolk Southern Intermodal Yard in Halfmoon/ Mechanicville.

#### ***VRS – Hoosick Jct. to Rutland***

This segment of the model was built based on the track charts of the Hoosick Main and B&R Main provided by VRS. The track charts included the track infrastructure and speeds; however they did not include stationing for the track infrastructure locations, or changes in speed. For the model, these locations were estimated based on the mileposts on the track chart.

The track charts also did not include information on switches or crossovers. For the purposes of the RTC model switch numbers and types were assumed to be the following.

- Main line switches were set as #10 dual control power switches,
- Turnout switches for industrial tracks or yard leads off a main track were set as #10 manual switches with electric locks, and
- Switches for yard tracks were set as #10 manual switches without locks.

The track charts provided included grade information which was input into the model accordingly. Signal information was not provided on track charts or aspect charts; however this information is not necessary for the TPC runs.

Tables (Attachment 2) developed by the VHB team include stationing for curves with recommendations for track speeds at those points. These speeds were input to the model at the appropriate locations. All straight track segments were assumed to be upgraded to an MAS of 60 mph.

The model also includes proposed changes to the infrastructure derived from track drawings developed by the VHB team, including the following proposed control sidings.

- a 4,000 foot siding roughly three miles west of North Bennington, and
- a 3,500 foot-siding roughly 13.5 miles north of Manchester and 18 miles south of Rutland. The above siding represents a lengthening and relocation of an existing siding with hand-throw switches.

#### ***TPC Inputs and Results***

TPC runs were performed in each direction on the study corridor between Albany and Rutland. The train set used included one P42-DC locomotive pulling five coach cars. Table 1 compares run times between the existing Amtrak Ethan Allen Express service between Albany and Rutland and the proposed service.

**Table 1**

| <b>Proposed Service</b> |                            | <b>Existing Amtrak Ethan Allen Express Service</b> |                            |
|-------------------------|----------------------------|--|----------------------------|
| <b>NB Station Stops</b> | <b>Proposed NB Service</b> | <b>NB Existing Station Stops</b>                   | <b>Existing NB Service</b> |
| Albany                  | 0:00                       | Albany   | 0:00                       |
| Schenectady             | 0:18                       | Schenectady  | 0:24                       |
| Mechanicville           | 0:55                       | Saratoga Springs                                   | 0:52                       |
| North Bennington        | 1:32                       | Fort Edward-Glens Falls                            | 1:13                       |
| Manchester              | 1:58                       | Castleton  | 2:18                       |
| Rutland                 | 2:39                       | Rutland  | 3:05                       |

| <b>SB Station Stops</b> | <b>Proposed SB Service</b> | <b>SB Existing Station Stops</b> | <b>Existing SB Service</b> |
|-------------------------|----------------------------|----------------------------------|----------------------------|
| Rutland                 | 0:00                       | Rutland                          | 0:00                       |
| Manchester              | 0:42                       | Castleton                        | 0:27                       |
| North Bennington        | 1:09                       | Fort Edward-Glens Falls          | 1:43                       |
| Mechanicville           | 1:46                       | Saratoga Springs                 | 2:12                       |
| Schenectady             | 2:26                       | Schenectady                      | 2:43                       |
| Albany                  | 2:49                       | Albany                           | 3:05                       |

The TPC graphs (Attachment 1) also show the results for the northbound and southbound train runs in detail including the speed of the train, the tractive effort and braking, station stops and cumulative travel times.

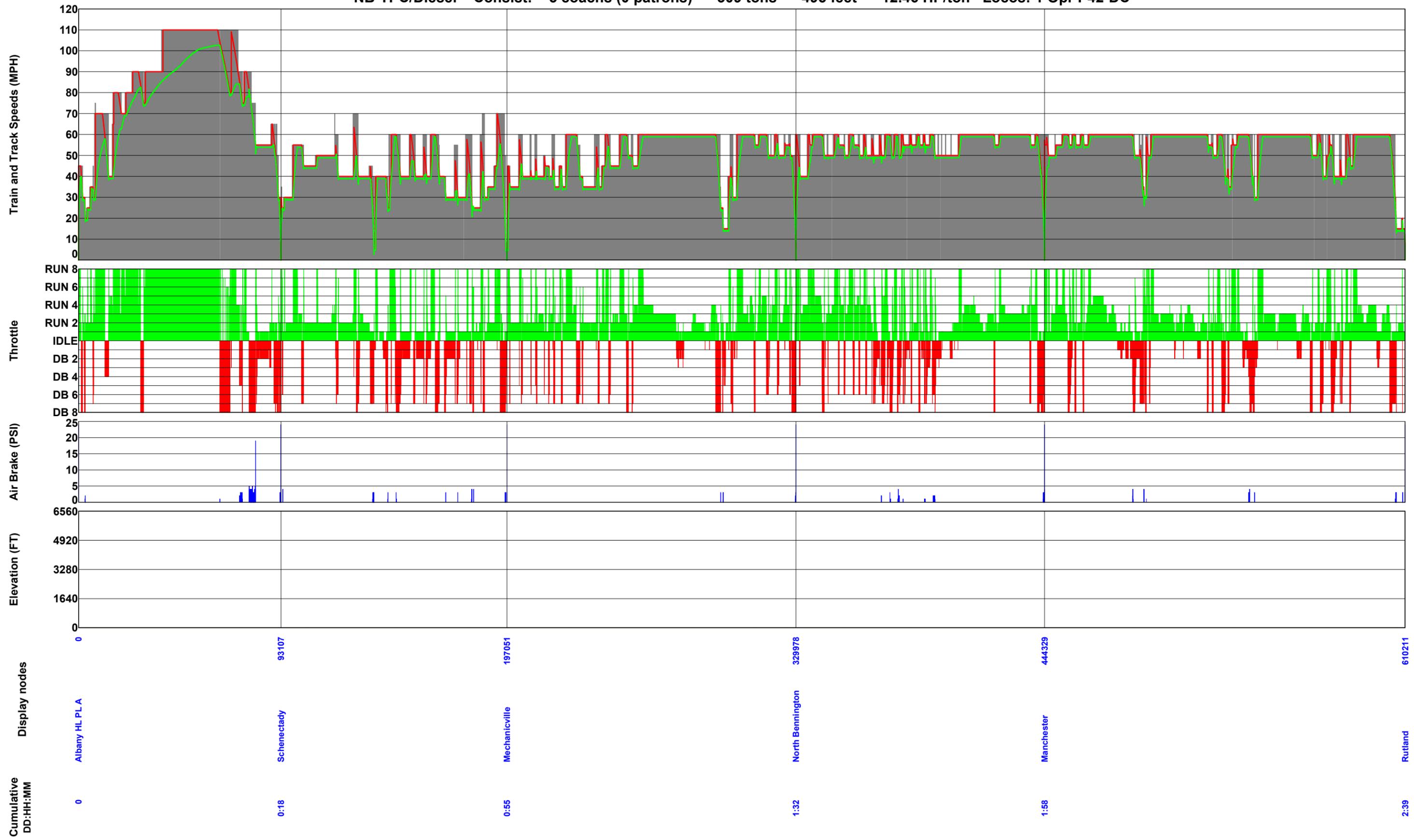
The TPC runs themselves show the effects of the physical geographic features and the positive influence of capital projects on the different corridor segments. Between Albany and Schenectady, the southbound TPC run had a much faster run time than the northbound TPC run. This is due to the long segments of increasing elevation departing Albany to Schenectady.

On the VRS segment, proposed upgrades to the railroad track infrastructure to attain a 60 mph MAS along the straight segments, result in run times over the line segment that are superior to the schedules when the line last saw passenger service in the early 1950s. At that time, scheduled train run times between Rutland and North Bennington were 82 minutes southbound and in 73 minutes northbound.



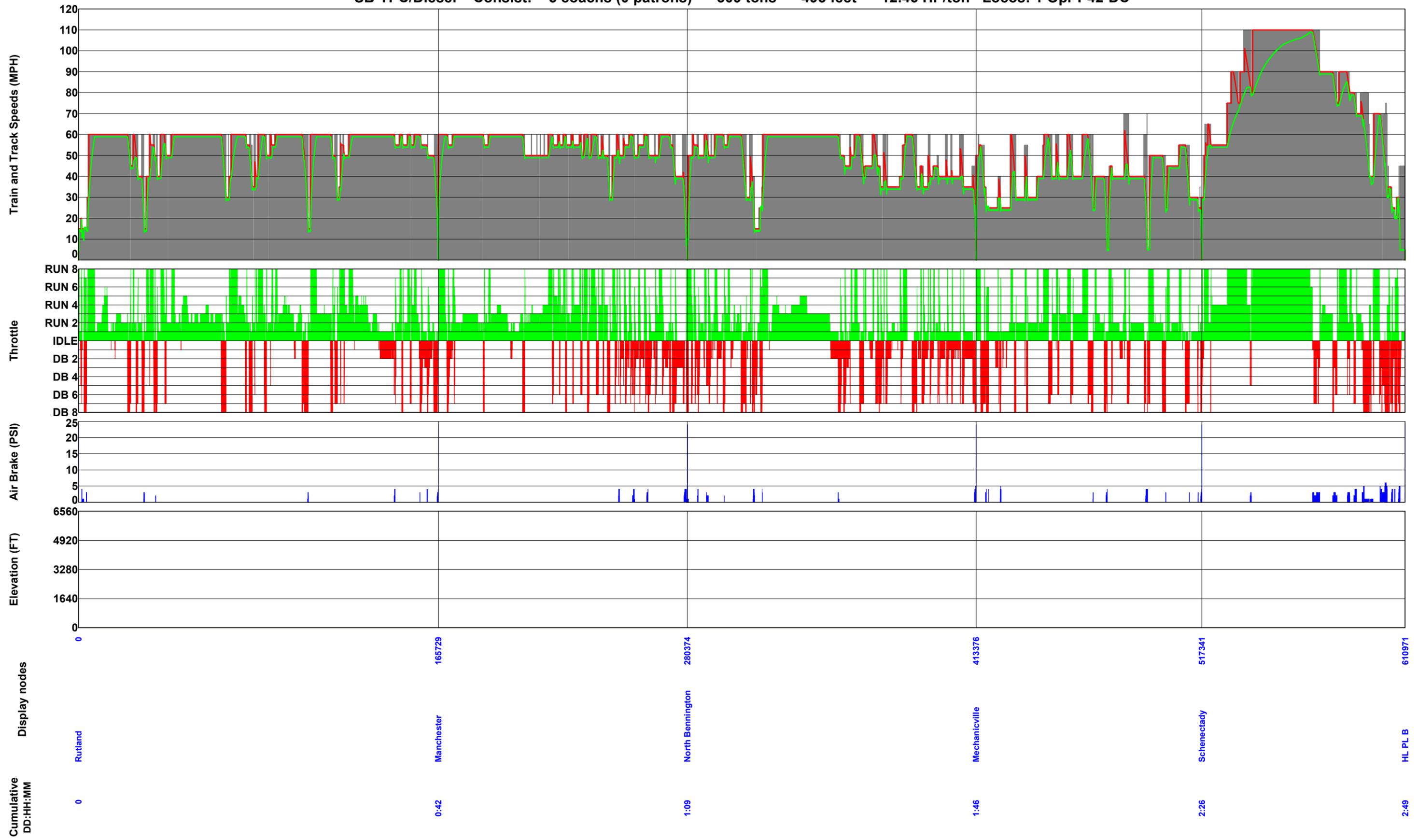
**NY/VT Bi-State Intercity Passenger Rail Study**

**NB-TPC/Diesel Consist: 5 coaches (0 patrons) 309 tons 495 feet 12.46 HP/ton Locos: 1 Opr P42-DC**



# NY/VT Bi-State Intercity Passenger Rail Study

SB-TPC/Diesel Consist: 5 coaches (0 patrons) 309 tons 495 feet 12.46 HP/ton Locos: 1 Opr P42-DC



NY-VT BI-STATE  
INTERCITY PASSENGER RAIL STUDY

CSX ML

| Curve Number          |    | Stationing<br>Start/End | Passenger<br>Speed | Freight<br>Speed | E <sub>a</sub> | Degree<br>(decimal) | Degree<br>(minutes) |
|-----------------------|----|-------------------------|--------------------|------------------|----------------|---------------------|---------------------|
| <b>Albany Station</b> |    | 10+00                   |                    |                  |                |                     |                     |
| 1.001                 | TS | 46+71.79                | 20                 | 20               | 0.50           | 6.700               | 6° 42' 00"          |
|                       | ST | 59+79.87                |                    |                  |                |                     |                     |
| 1.002                 | TS | 71+66.24                | 25                 | 25               | 2.00           | 5.000               | 5° 00' 00"          |
|                       | ST | 75+51.42                |                    |                  |                |                     |                     |
| 1.003                 | TS | 77+67.88                | 25                 | 25               | 2.00           | 6.750               | 6° 45' 00"          |
|                       | ST | 88+13.31                |                    |                  |                |                     |                     |
| 1.004                 | TS | 100+44.47               | 30                 | 25               | 1.50           | 5.458               | 5° 27' 30"          |
|                       | ST | 112+84.58               |                    |                  |                |                     |                     |
| 1.005                 | TS | 120+36.01               | 40                 | 25               | 0.50           | 2.750               | 2° 45' 00"          |
|                       | ST | 127+58.64               |                    |                  |                |                     |                     |
| 1.006                 | TS | 136+09.21               | 35                 | 25               | 0.50           | 3.408               | 3° 24' 30"          |
|                       | ST | 154+57.35               |                    |                  |                |                     |                     |
| 1.007                 | TS | 155+69.15               | 30                 | 25               | 1.50           | 5.850               | 5° 51' 00"          |
|                       | ST | 164+30.76               |                    |                  |                |                     |                     |
| 1.008                 | TS | 171+13.34               | 40                 | 25               | 0.50           | 1.000               | 1° 00' 00"          |
|                       | ST | 182+59.61               |                    |                  |                |                     |                     |
| 1.009                 | TS | 184+95.18               | 75                 | 50               | 1.75           | 1.192               | 1° 11' 30"          |
|                       | ST | 198+51.56               |                    |                  |                |                     |                     |
| 1.010                 | TS | 246+49.15               | 65                 | 50               | 2.75           | 1.908               | 1° 54' 30"          |
|                       | ST | 260+01.79               |                    |                  |                |                     |                     |
| 1.011                 | TS | 317+68.21               | 70                 | 50               | 2.50           | 1.508               | 1° 30' 30"          |
|                       | ST | 334+64.93               |                    |                  |                |                     |                     |
| 1.012                 | TS | 353+07.01               | 75                 | 50               | 1.25           | 1.025               | 1° 01' 30"          |
|                       | ST | 370+44.33               |                    |                  |                |                     |                     |
| 1.013                 | TS | 686+08.33               | 80                 | 50               | 0.50           | 0.183               | 0° 11' 00"          |
|                       | ST | 691+60.36               |                    |                  |                |                     |                     |
| <b>Crossover</b>      | PS | 768+37.88               | 45                 | 45               | 0              |                     |                     |
|                       | PI | 768+96.12               |                    |                  |                |                     |                     |
|                       | PI | 771+96.31               |                    |                  |                |                     |                     |
|                       | PS | 772+54.55               |                    |                  |                |                     |                     |
| 1.1.014               | TS | 773+72.52               | 75                 | 30               | 0.50           | 0.879               | 0° 52' 45"          |
|                       | ST | 803+42.01               |                    |                  |                |                     |                     |
| 1.1.015               | TS | 851+38.40               | 45                 | 30               | 1.75           | 2.933               | 2° 56' 00"          |
|                       | ST | 888+52.60               |                    |                  |                |                     |                     |
| 1.1.016               | TS | 892+86.18               | 55                 | 30               | 0.50           | 1.583               | 1° 35' 00"          |
|                       | ST | 903+20.63               |                    |                  |                |                     |                     |
| 1.1.017               | TS | 916+37.42               | 40                 | 30               | 2.00           | 3.617               | 3° 37' 00"          |
|                       | ST | 927+57.29               |                    |                  |                |                     |                     |
| 1.1.018               | TS | 939+62.00               | 30                 | 30               | 1.00           | 3.371               | 3° 22' 15"          |
|                       | ST | 948+14.58               |                    |                  |                |                     |                     |

NY-VT BI-STATE  
INTERCITY PASSENGER RAIL STUDY

|                        |                     |            |            |    |                              |       |            |            |
|------------------------|---------------------|------------|------------|----|------------------------------|-------|------------|------------|
| Freight ML CP          | Schenectady Station |            | 949+00     |    |                              |       |            |            |
|                        | 1.1.019             | TS         | 949+56.49  | 35 | 25                           | 0.50  | 1.783      | 1° 47' 00" |
|                        |                     | ST         | 953+88.26  |    |                              |       |            |            |
|                        | 1.1.020             | TS         | 954+29.24  | 25 | 20                           | 0.50  | 5.733      | 5° 44' 00" |
|                        |                     | ST         | 960+86.55  |    |                              |       |            |            |
|                        | Existing Turnout    | LLT        | 961+19.30  |    |                              |       |            |            |
|                        |                     | PI         | 962+79.96  |    |                              |       |            |            |
|                        |                     | PS         | 963+38.20  |    |                              |       |            |            |
|                        | 1.1.021             | TS         | 965+31.77  | 30 | 30                           | 3.00  | 6.667      | 6° 40' 00" |
|                        |                     | ST         | 971+92.90  |    |                              |       |            |            |
|                        | 1.1.022             | TS         | 974+66.23  | 30 | 30                           | 2.25  | 5.358      | 5° 21' 30" |
|                        |                     | ST         | 982+08.05  |    |                              |       |            |            |
|                        | 1.1.023             | TS         | 983+65.79  | 30 | 30                           | 0.50  | 2.729      | 2° 43' 45" |
|                        |                     | ST         | 991+20.92  |    |                              |       |            |            |
|                        | 1.1.024             | TS         | 994+24.59  | 30 | 30                           | 1.00  | 3.250      | 3° 15' 00" |
|                        |                     | ST         | 1003+73.07 |    |                              |       |            |            |
|                        | 1.1.025             | TS         | 1008+22.28 | 30 | 30                           | 0.25  | 1.908      | 1° 54' 30" |
|                        |                     | ST         | 1014+97.99 |    |                              |       |            |            |
|                        | 1.1.026             | TS         | 1020+49.99 | 30 | 30                           | 3.75  | 7.700      | 7° 42' 00" |
|                        |                     | ST         | 1032+52.86 |    |                              |       |            |            |
| 1.1.027                | TS                  | 1036+78.43 | 45         | 30 | 1.50                         | 2.925 | 2° 55' 30" |            |
|                        | ST                  | 1067+93.78 |            |    |                              |       |            |            |
| Existing Crossover     | PS                  | 1068+95.58 |            |    |                              |       |            |            |
|                        | PI                  | 1069+53.83 | 45         | 45 | 0                            |       |            |            |
|                        | PI                  | 1072+54.02 |            |    |                              |       |            |            |
|                        | PS                  | 1073+12.26 |            |    |                              |       |            |            |
|                        |                     |            |            |    |                              |       |            |            |
| 1.1.028                | TS                  | 1116+89.23 | 50         | 30 | 0.25                         | 0.875 | 0° 52' 30" |            |
|                        | ST                  | 1157+08.02 |            |    |                              |       |            |            |
| 1.1.029                | TS                  | 1174+14.93 | 50         | 30 | 0.50                         | 1.100 | 1° 06' 00" |            |
|                        | ST                  | 1188+01.97 |            |    |                              |       |            |            |
| 3.1.001                | TS                  | 1200+18.04 | 40         | 30 | 1.25                         | 5.750 | 5° 45' 00" |            |
|                        | ST                  | 1203+44.39 |            |    |                              |       |            |            |
| 3.1.002                | TS                  | 1204+46.29 | 40         | 35 | 1.75                         | 3.500 | 3° 30' 00" |            |
|                        | ST                  | 1216+85.63 |            |    |                              |       |            |            |
| 3.1.003                | TS                  | 1225+24.06 | 40         | 40 | 0.75                         | 1.592 | 1° 35' 30" |            |
|                        | ST                  | 1262+63.21 |            |    |                              |       |            |            |
| 3.1.004                | TS                  | 1287+31.40 | 40         | 40 | 2.75                         | 3.550 | 3° 33' 00" |            |
|                        | ST                  | 1316+04.03 |            |    |                              |       |            |            |
| 3.1.005                | TS                  | 1323+50.70 | 40         | 40 | 2.75                         | 4.000 | 4° 00' 00" |            |
|                        | ST                  | 1338+09.51 |            |    |                              |       |            |            |
| Proposed #20 Crossover | PS                  | 1338+80.88 |            |    |                              |       |            |            |
|                        | PI                  | 1339+39.12 | 45         | 45 | Connection to Canadian ML CP |       |            |            |
|                        | PI                  | 1342+39.31 |            |    |                              |       |            |            |
|                        | PS                  | 1342+97.55 |            |    |                              |       |            |            |
|                        |                     |            |            |    |                              |       |            |            |

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|                         |                           |            |            |                     |                       |                                |            |            |
|-------------------------|---------------------------|------------|------------|---------------------|-----------------------|--------------------------------|------------|------------|
| Freight ML CP           | Proposed #15<br>Crossover | PS         | 1343+62.55 | 30                  | 30                    | Begin 3rd Track/B&R Connection |            |            |
|                         |                           | PI         | 1344+00.50 |                     |                       |                                |            |            |
|                         |                           | PI         | 1346+25.75 |                     |                       |                                |            |            |
|                         |                           | PS         | 1346+63.69 |                     |                       |                                |            |            |
|                         | Proposed #15<br>Turnout   | LLT        | 1361+65.93 | 30                  | 30                    | End 3rd Track                  |            |            |
|                         |                           | PI         | 1362+87.26 |                     |                       |                                |            |            |
|                         |                           | PS         | 1363+25.20 |                     |                       |                                |            |            |
|                         | Proposed #20<br>Crossover | POS        | 1363+90.20 | 45                  | 45                    |                                |            |            |
|                         |                           | PI         | 1364+48.45 |                     |                       |                                |            |            |
|                         |                           | PI         | 1367+48.26 |                     |                       |                                |            |            |
|                         |                           | POS        | 1368+06.50 |                     |                       |                                |            |            |
|                         | 3.1.006                   | TS         | 1368+75.04 | 40                  | 40                    | 0.75                           | 1.592      | 1° 35' 30" |
|                         |                           | ST         | 1388+50.83 |                     |                       |                                |            |            |
|                         | 3.1.007                   | TS         | 1420+40.21 | 40                  | 40                    | 0.25                           | 1.150      | 1° 09' 00" |
|                         |                           | ST         | 1431+60.46 |                     |                       |                                |            |            |
|                         | Existing<br>Turnout       | LLT        | 1448+62.02 | End Existing Siding |                       |                                |            |            |
|                         |                           | PI         | 1450+22.21 |                     |                       |                                |            |            |
|                         |                           | PS         | 1450+80.46 |                     |                       |                                |            |            |
|                         | 3.1.008                   | TS         | 1445+87.83 | 40                  | 40                    | 1.00                           | 1.908      | 1° 54' 30" |
|                         |                           | ST         | 1448+56.28 |                     |                       |                                |            |            |
| Proposed #20<br>Turnout | PS                        | 1474+92.12 | 45         | 45                  | Begin Proposed Siding |                                |            |            |
|                         | PI                        | 1475+50.37 |            |                     |                       |                                |            |            |
|                         | LLT                       | 1477+11.04 |            |                     |                       |                                |            |            |
| 3.1.009                 | TS                        | 1495+84.48 | 40         | 40                  | 0.50                  | 1.433                          | 1° 26' 00" |            |
|                         | ST                        | 1515+88.42 |            |                     |                       |                                |            |            |
| 3.1.010                 | TS                        | 1525+27.41 | 40         | 40                  | 1.00                  | 2.000                          | 2° 00' 00" |            |
|                         | ST                        | 1535+42.05 |            |                     |                       |                                |            |            |
| Proposed #20<br>Turnout | LLT                       | 1560+73.74 | 45         | 45                  | End Proposed Siding   |                                |            |            |
|                         | PI                        | 1562+34.41 |            |                     |                       |                                |            |            |
|                         | PS                        | 1562+92.66 |            |                     |                       |                                |            |            |
| 3.1.011                 | TS                        | 1589+12.31 | 40         | 40                  | 3.50                  | 4.092                          | 4° 05' 30" |            |
|                         | ST                        | 1597+36.97 |            |                     |                       |                                |            |            |
| 3.1.012                 | TS                        | 1614+93.22 | 40         | 40                  | 3.00                  | 3.771                          | 3° 46' 15" |            |
|                         | ST                        | 1629+67.78 |            |                     |                       |                                |            |            |
| 3.1.013                 | TS                        | 1674+06.23 | 40         | 40                  | 1.00                  | 2.000                          | 2° 00' 00" |            |
|                         | ST                        | 1685+33.12 |            |                     |                       |                                |            |            |
| 3.1.014                 | TS                        | 1692+98.87 | 40         | 40                  | 1.00                  | 2.000                          | 2° 00' 00" |            |
|                         | ST                        | 1701+83.67 |            |                     |                       |                                |            |            |
| 3.1.015                 | TS                        | 1703+34.97 | 40         | 40                  | 1.00                  | 1.500                          | 1° 30' 00" |            |
|                         | ST                        | 1710+50.16 |            |                     |                       |                                |            |            |
| 3.1.016                 | TS                        | 1711+67.10 | 30         | 40                  | 2.25                  | 3.833                          | 3° 50' 00" |            |
|                         | ST                        | 1719+78.49 |            |                     |                       |                                |            |            |
| 3.1.017                 | TS                        | 1723+08.02 | 30         | 30                  | 1.75                  | 4.408                          | 4° 24' 30" |            |
|                         | ST                        | 1735+77.44 |            |                     |                       |                                |            |            |
| 3.1.018                 | TS                        | 1738+82.26 | 30         | 30                  | 0.50                  | 1.592                          | 1° 35' 30" |            |
|                         | ST                        | 1751+34.73 |            |                     |                       |                                |            |            |

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|                       |     |            |    |    |      |       |            |
|-----------------------|-----|------------|----|----|------|-------|------------|
| 3.1.019               | TS  | 1769+39.43 | 30 | 30 | 0.75 | 2.867 | 2° 52' 00" |
|                       | ST  | 1778+11.29 |    |    |      |       |            |
| 3.1.020               | TS  | 1791+08.66 | 30 | 30 | 0.75 | 2.867 | 2° 52' 00" |
|                       | ST  | 1799+05.58 |    |    |      |       |            |
| 3.1.021               | TS  | 1800+06.30 | 30 | 30 | 1.25 | 3.833 | 3° 50' 00" |
|                       | ST  | 1804+88.84 |    |    |      |       |            |
| 3.1.022               | TS  | 1833+66.84 | 25 | 10 | 0.50 | 1.433 | 1° 26' 00" |
|                       | ST  | 1838+04.43 |    |    |      |       |            |
| 3.1.023               | TS  | 1838+76.89 | 25 | 20 | 0.50 | 1.500 | 1° 30' 00" |
|                       | ST  | 1845+12.50 |    |    |      |       |            |
| 3.1.024               | TS  | 1847+48.29 | 25 | 20 | 0.50 | 1.000 | 1° 00' 00" |
|                       | ST  | 1850+68.18 |    |    |      |       |            |
| 3.1.025               | TS  | 1852+01.05 | 25 | 20 | 0.50 | 1.000 | 1° 00' 00" |
|                       | ST  | 1854+73.71 |    |    |      |       |            |
| 3.1.026               | TS  | 1858+00.19 | 25 | 10 | 1.00 | 7.400 | 7° 24' 00" |
|                       | ST  | 1862+51.03 |    |    |      |       |            |
| 3.1.027               | TS  | 1863+31.04 | 25 | 10 | 0.75 | 5.500 | 5° 30' 00" |
|                       | ST  | 1875+63.44 |    |    |      |       |            |
| 3.1.028               | TS  | 1878+81.20 | 40 | 10 | 0.50 | 2.500 | 2° 30' 00" |
|                       | ST  | 1887+53.92 |    |    |      |       |            |
| 3.1.029               | TS  | 1918+22.70 | 30 | 10 | 0.75 | 3.000 | 3° 00' 00" |
|                       | ST  | 1920+60.67 |    |    |      |       |            |
| 3.1.030               | TS  | 1923+22.80 | 25 | 10 | 0.50 | 6.833 | 6° 50' 00" |
|                       | ST  | 1942+78.07 |    |    |      |       |            |
| 3.1.031               | TS  | 1959+83.66 | 25 | 10 | 0.50 | 6.371 | 6° 22' 15" |
|                       | ST  | 1972+53.54 |    |    |      |       |            |
| 3.1.032               | TS  | 1974+91.26 | 35 | 10 | 0.50 | 4.000 | 4° 00' 00" |
|                       | ST  | 1982+34.08 |    |    |      |       |            |
| 3.1.033               | TS  | 1985+59.45 | 55 | 30 | 0.50 | 1.592 | 1° 35' 30" |
|                       | ST  | 2007+51.28 |    |    |      |       |            |
| 3.1.034               | TS  | 2015+02.15 | 50 | 30 | 0.50 | 1.000 | 1° 00' 00" |
|                       | ST  | 2019+06.25 |    |    |      |       |            |
| Existing Turnout      | LLT | 2019+36.69 |    |    |      |       |            |
|                       | PI  | 2020+97.36 |    |    |      |       |            |
|                       | PS  | 2021+55.60 |    |    |      |       |            |
| Mechanicville Station |     | 2025+00    |    |    |      |       |            |
| 3.1.035               | TS  | 2026+93.59 | 45 | 30 | 0.50 | 2.000 | 2° 00' 00" |
|                       | ST  | 2038+14.37 |    |    |      |       |            |
| 3.1.036               | TS  | 2039+42.05 | 35 | 30 | 1.00 | 3.950 | 3° 57' 00" |
|                       | ST  | 2054+67.65 |    |    |      |       |            |
| 3.1.037               | TS  | 2065+77.65 | 35 | 30 | 0.75 | 3.504 | 3° 30' 15" |
|                       | ST  | 2073+22.11 |    |    |      |       |            |
| 3.1.038               | TS  | 2074+33.95 | 35 | 30 | 1.13 | 4.021 | 4° 01' 15" |
|                       | ST  | 2088+33.22 |    |    |      |       |            |
| 3.1.039               | TS  | 2108+04.91 | 40 | 30 | 0.13 | 2.387 | 2° 23' 15" |
|                       | ST  | 2141+13.45 |    |    |      |       |            |

PAN-AM

NY-VT BI-STATE  
INTERCITY PASSENGER RAIL STUDY

|         |                         |                   |                   |    |      |                       |            |            |  |
|---------|-------------------------|-------------------|-------------------|----|------|-----------------------|------------|------------|--|
| PAN-AM  | 3.1.040                 | TS                | <u>2148+06.54</u> | 40 | 30   | 0.63                  | 3.183      | 3° 11' 00" |  |
|         |                         | ST                | 2163+07.16        |    |      |                       |            |            |  |
|         | Proposed #20<br>Turnout | PS                | <u>2169+92.12</u> | 45 | 45   | Begin Proposed Siding |            |            |  |
|         |                         | PI                | <u>2170+50.37</u> |    |      |                       |            |            |  |
|         |                         | LLT               | <u>2172+11.04</u> |    |      |                       |            |            |  |
|         | 3.1.041                 | TS                | <u>2180+90.31</u> | 40 | 30   | 0.13                  | 2.533      | 2° 32' 00" |  |
|         |                         | ST                | 2196+99.51        |    |      |                       |            |            |  |
|         | 3.1.042                 | TS                | <u>2201+25.06</u> | 50 | 30   | 0.50                  | 1.908      | 1° 54' 30" |  |
|         |                         | ST                | <u>2212+02.62</u> |    |      |                       |            |            |  |
|         | 3.1.043                 | TS                | <u>2214+11.30</u> | 45 | 30   | 1.00                  | 1.908      | 1° 54' 30" |  |
|         |                         | ST                | <u>2219+38.66</u> |    |      |                       |            |            |  |
|         | 3.1.044                 | TS                | <u>2221+61.18</u> | 35 | 30   | 2.50                  | 5.733      | 5° 44' 00" |  |
|         |                         | ST                | <u>2231+87.33</u> |    |      |                       |            |            |  |
|         | 3.1.045                 | TS                | <u>2237+61.75</u> | 40 | 30   | 0.50                  | 1.908      | 1° 54' 30" |  |
|         |                         | ST                | <u>2242+52.59</u> |    |      |                       |            |            |  |
|         | Proposed #20<br>Turnout | LLT               | <u>2255+19.39</u> | 45 | 45   | End Proposed Siding   |            |            |  |
|         |                         | PI                | <u>2256+80.06</u> |    |      |                       |            |            |  |
|         |                         | PS                | <u>2257+38.30</u> |    |      |                       |            |            |  |
|         | 3.1.046                 | TS                | <u>2266+45.28</u> | 35 | 30   | 0.75                  | 3.500      | 3° 30' 00" |  |
|         |                         | ST                | <u>2280+60.76</u> |    |      |                       |            |            |  |
|         | 3.1.047                 | TS                | <u>2284+27.31</u> | 45 | 30   | 1.50                  | 2.500      | 2° 30' 00" |  |
|         |                         | ST                | <u>2288+50.37</u> |    |      |                       |            |            |  |
|         | 3.1.048                 | TS                | <u>2290+93.07</u> | 45 | 30   | 0.50                  | 1.500      | 1° 30' 00" |  |
|         |                         | ST                | <u>2294+93.73</u> |    |      |                       |            |            |  |
|         | 3.1.049                 | TS                | <u>2301+37.15</u> | 35 | 30   | 1.13                  | 4.092      | 4° 05' 30" |  |
|         |                         | ST                | <u>2313+41.19</u> |    |      |                       |            |            |  |
| 3.1.050 | TS                      | <u>2325+33.40</u> | 60                | 30 | 0.50 | 0.954                 | 0° 57' 15" |            |  |
|         | ST                      | <u>2336+50.29</u> |                   |    |      |                       |            |            |  |
| 3.1.051 | TS                      | <u>2363+95.03</u> | 55                | 30 | 0.75 | 1.433                 | 1° 26' 00" |            |  |
|         | ST                      | <u>2373+95.67</u> |                   |    |      |                       |            |            |  |
| 3.1.052 | TS                      | <u>2375+33.23</u> | 40                | 30 | 0.25 | 2.750                 | 2° 45' 00" |            |  |
|         | ST                      | <u>2384+91.71</u> |                   |    |      |                       |            |            |  |
| 3.1.053 | TS                      | <u>2392+12.91</u> | 35                | 30 | 1.00 | 3.821                 | 3° 49' 15" |            |  |
|         | ST                      | <u>2407+35.35</u> |                   |    |      |                       |            |            |  |
| 3.1.054 | TS                      | <u>2409+02.78</u> | 35                | 30 | 0.75 | 3.450                 | 3° 27' 00" |            |  |
|         | ST                      | <u>2430+77.37</u> |                   |    |      |                       |            |            |  |
| 3.1.055 | TS                      | <u>2434+29.35</u> | 35                | 30 | 1.13 | 3.992                 | 3° 59' 30" |            |  |
|         | ST                      | <u>2444+92.11</u> |                   |    |      |                       |            |            |  |
| 3.1.056 | TS                      | <u>2463+21.01</u> | 35                | 30 | 0.75 | 3.504                 | 3° 30' 15" |            |  |
|         | ST                      | <u>2471+75.87</u> |                   |    |      |                       |            |            |  |
| 3.1.057 | TS                      | <u>2472+98.22</u> | 45                | 30 | 1.75 | 3.275                 | 3° 16' 30" |            |  |
|         | ST                      | <u>2487+31.62</u> |                   |    |      |                       |            |            |  |
| 3.1.058 | TS                      | <u>2514+17.97</u> | 45                | 30 | 1.75 | 3.000                 | 3° 00' 00" |            |  |
|         | ST                      | <u>2528+41.90</u> |                   |    |      |                       |            |            |  |
| 3.1.059 | TS                      | <u>2530+18.13</u> | 45                | 30 | 0.50 | 2.292                 | 2° 17' 30" |            |  |
|         | ST                      | <u>2543+76.74</u> |                   |    |      |                       |            |            |  |

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|----------------------|----------------------|------------|------------|----|------|-------|--|-----------------------|
| PAN-AM               | 3.1.060              | TS         | 2562+61.55 | 60 | 40   | 0.50  | 1.000  | 1° 00' 00"            |
|                      |                      | ST         | 2581+92.04 |    |      |       |  |                       |
|                      | 3.1.061              | TS         | 2588+78.02 | 50 | 40   | 1.00  | 2.200  | 2° 12' 00"            |
|                      |                      | ST         | 2600+70.41 |    |      |       |  |                       |
|                      | Proposed #20 Turnout | PS         | 2674+92.12 | 45 | 45   |       |  | Begin Proposed Siding |
|                      |                      | PI         | 2675+50.37 |    |      |       |  |                       |
|                      |                      | LLT        | 2677+10.83 |    |      |       |  |                       |
|                      | Proposed #20 Turnout | LLT        | 2782+73.41 | 45 | 45   |       |  | End Proposed Siding   |
|                      |                      | PI         | 2784+33.88 |    |      |       |  |                       |
|                      |                      | PS         | 2784+92.12 |    |      |       |  |                       |
| 3.1.062              | TS                   | 2810+82.51 | 60         | 40 | 0.50 | 1.300 | 1° 18' 00"   |                       |
|                      | ST                   | 2829+24.08 |            |    |      |       |  |                       |
| 3.1.063              | TS                   | 2878+98.24 | 60         | 40 | 0.50 | 1.275 | 1° 16' 30"   |                       |
|                      | ST                   | 2939+50.05 |            |    |      |       |  |                       |
| 3.1.064              | TS                   | 2942+10.47 | 60         | 40 | 0.50 | 0.950 | 0° 57' 00"   |                       |
|                      | ST                   | 2970+18.05 |            |    |      |       |  |                       |
| 3.1.065              | TS                   | 3008+54.25 | 35         | 30 | 0.50 | 1.867 | 1° 52' 00"   |                       |
|                      | ST                   | 3010+65.71 |            |    |      |       |  |                       |
| Existing Turnout     | LLT                  | 3010+66.52 |            |    |      |       |  |                       |
|                      | PI                   | 3010+27.28 |            |    |      |       |  |                       |
|                      | PS                   | 3012+85.53 |            |    |      |       |  |                       |
| Existing Turnout     | PS                   | 3020+10.05 |            |    |      |       |  |                       |
|                      | PI                   | 3020+39.95 |            |    |      |       |  |                       |
|                      | LLT                  | 3021+19.51 |            |    |      |       |  |                       |
| 3.1.066              | PC                   | 3021+22.78 | 15         | 15 | 0.00 | 4.083 | 4° 05' 00"   |                       |
|                      | PT                   | 3041+52.06 |            |    |      |       |  |                       |
| 3.1.067              | TS                   | 3044+38.88 | 40         | 30 | 0.75 | 3.500 | 3° 30' 00"   |                       |
|                      | ST                   | 3052+63.40 |            |    |      |       |  |                       |
| 3.1.068              | TS                   | 3064+47.73 | 60         | 40 | 0.50 | 1.617 | 1° 37' 00"   |                       |
|                      | ST                   | 3073+33.98 |            |    |      |       |  |                       |
| 3.1.069              | TS                   | 3076+48.80 | 30         | 30 | 1.25 | 4.021 | 4° 01' 15"   |                       |
|                      | ST                   | 3086+94.43 |            |    |      |       |  |                       |
| 3.1.070              | TS                   | 3087+78.36 | 30         | 30 | 0.50 | 3.033 | 3° 02' 00"   |                       |
|                      | ST                   | 3090+52.09 |            |    |      |       |  |                       |
| 3.1.071              | TS                   | 3094+73.01 | 60         | 40 | 0.75 | 1.783 | 1° 47' 00"   |                       |
|                      | ST                   | 3114+84.65 |            |    |      |       |  |                       |
| Proposed #20 Turnout | PS                   | 3115+84.64 | 45         | 45 |      |       | Begin Proposed Siding* (see note at end in regards to siding curves) |                       |
|                      | PI                   | 3116+42.88 |            |    |      |       |  |                       |
|                      | LLT                  | 3118+03.55 |            |    |      |       |  |                       |
| 3.1.072              | TS                   | 3120+24.57 | 60         | 40 | 1.25 | 2.000 | 2° 00' 00"   |                       |
|                      | ST                   | 3137+49.21 |            |    |      |       |  |                       |
| Proposed #20 Turnout | LLT                  | 3162+77.03 | 45         | 45 |      |       | End Proposed Siding  |                       |
|                      | PI                   | 3164+37.50 |            |    |      |       |  |                       |
|                      | PS                   | 3164+95.74 |            |    |      |       |  |                       |
| 3.1.073              | TS                   | 3169+45.30 | 55         | 40 | 1.25 | 2.250 | 2° 15' 00"   |                       |
|                      | ST                   | 3181+54.82 |            |    |      |       |  |                       |

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|-----------------------|----|------------|----|----|------|-------|------------|
| 3.1.074               | TS | 3194+64.01 | 60 | 40 | 0.75 | 1.833 | 1° 50' 00" |
|                       | ST | 3209+48.91 |    |    |      |       |            |
| 3.1.075               | TS | 3229+26.91 | 50 | 40 | 2.75 | 3.583 | 3° 35' 00" |
|                       | ST | 3238+79.30 |    |    |      |       |            |
| 3.1.076               | TS | 3240+84.41 | 50 | 40 | 2.00 | 3.050 | 3° 03' 00" |
|                       | ST | 3253+70.50 |    |    |      |       |            |
| 3.1.077               | TS | 3276+22.65 | 50 | 40 | 2.00 | 3.000 | 3° 00' 00" |
|                       | ST | 3298+47.23 |    |    |      |       |            |
| 3.1.078               | TS | 3303+45.31 | 55 | 40 | 1.50 | 2.533 | 2° 32' 00" |
|                       | ST | 3318+24.35 |    |    |      |       |            |
| 3.1.079               | TS | 3328+14.42 | 50 | 40 | 2.00 | 3.000 | 3° 00' 00" |
|                       | ST | 3348+32.31 |    |    |      |       |            |
| N. Bennington Station |    | 3350+00    |    |    |      |       |            |
| 3.1.080               | TS | 3362+05.78 | 40 | 40 | 1.50 | 3.167 | 3° 10' 00" |
|                       | ST | 3382+09.07 |    |    |      |       |            |
| 3.1.081               | TS | 3383+38.56 | 40 | 40 | 2.25 | 4.000 | 4° 00' 00" |
|                       | ST | 3393+46.62 |    |    |      |       |            |
| 3.1.082               | TS | 3408+15.86 | 55 | 40 | 0.50 | 1.000 | 1° 00' 00" |
|                       | ST | 3414+45.24 |    |    |      |       |            |
| 3.1.083               | TS | 3473+13.77 | 50 | 40 | 2.25 | 3.183 | 3° 11' 00" |
|                       | ST | 3485+62.63 |    |    |      |       |            |
| 3.1.084               | TS | 3490+84.56 | 50 | 40 | 1.75 | 2.867 | 2° 52' 00" |
|                       | ST | 3509+78.03 |    |    |      |       |            |
| 3.1.085               | TS | 3536+36.54 | 55 | 40 | 1.50 | 2.500 | 2° 30' 00" |
|                       | ST | 3557+63.95 |    |    |      |       |            |
| 3.1.086               | TS | 3561+08.21 | 50 | 40 | 2.00 | 3.000 | 3° 00' 00" |
|                       | ST | 3574+92.66 |    |    |      |       |            |
| 3.1.087               | TS | 3590+51.40 | 60 | 40 | 0.50 | 1.500 | 1° 30' 00" |
|                       | ST | 3600+93.32 |    |    |      |       |            |
| 3.1.088               | TS | 3603+65.73 | 55 | 40 | 0.75 | 2.000 | 2° 00' 00" |
|                       | ST | 3620+55.79 |    |    |      |       |            |
| 3.1.089               | TS | 3628+60.83 | 50 | 40 | 2.00 | 3.000 | 3° 00' 00" |
|                       | ST | 3642+73.88 |    |    |      |       |            |
| 3.1.090               | TS | 3659+89.84 | 50 | 40 | 2.00 | 3.000 | 3° 00' 00" |
|                       | ST | 3679+99.27 |    |    |      |       |            |
| 3.1.091               | TS | 3693+11.06 | 50 | 40 | 2.00 | 3.000 | 3° 00' 00" |
|                       | ST | 3712+77.44 |    |    |      |       |            |
| 3.1.092               | TS | 3726+04.81 | 50 | 40 | 2.00 | 3.000 | 3° 00' 00" |
|                       | ST | 3737+05.32 |    |    |      |       |            |
| 3.1.093               | TS | 3775+00.66 | 50 | 40 | 2.25 | 3.250 | 3° 15' 00" |
|                       | ST | 3772+43.88 |    |    |      |       |            |
| 3.1.094               | TS | 3791+13.90 | 60 | 40 | 0.50 | 1.000 | 1° 00' 00" |
|                       | ST | 3801+98.62 |    |    |      |       |            |
| 3.1.095               | TS | 3803+95.88 | 50 | 40 | 2.00 | 3.000 | 3° 00' 00" |
|                       | ST | 3810+09.84 |    |    |      |       |            |

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|--------------------|----|------------|----|----|------|-------|------------|
| 3.1.096            | TS | 3825+67.92 | 55 | 40 | 2.00 | 2.667 | 2° 40' 00" |
|                    | ST | 3851+97.60 |    |    |      |       |            |
| 3.1.097            | TS | 3864+91.89 | 55 | 40 | 0.75 | 2.000 | 2° 00' 00" |
|                    | ST | 3883+49.98 |    |    |      |       |            |
| 3.1.098            | TS | 3902+84.92 | 55 | 40 | 1.50 | 2.500 | 2° 30' 00" |
|                    | ST | 3914+56.35 |    |    |      |       |            |
| 3.1.099            | TS | 3927+12.71 | 55 | 40 | 0.75 | 2.000 | 2° 00' 00" |
|                    | ST | 3944+34.44 |    |    |      |       |            |
| 3.1.100            | TS | 3971+85.61 | 50 | 40 | 2.00 | 3.000 | 3° 00' 00" |
|                    | ST | 3984+67.38 |    |    |      |       |            |
| 3.1.101            | TS | 3989+48.18 | 50 | 40 | 3.00 | 3.371 | 3° 22' 15" |
|                    | ST | 4002+41.86 |    |    |      |       |            |
| 3.1.102            | TS | 4003+53.55 | 50 | 40 | 3.00 | 3.333 | 3° 20' 00" |
|                    | ST | 4018+37.50 |    |    |      |       |            |
| 3.1.103            | TS | 4022+30.03 | 50 | 40 | 2.50 | 3.504 | 3° 30' 15" |
|                    | ST | 4043+65.37 |    |    |      |       |            |
| 3.1.104            | TS | 4046+82.86 | 50 | 40 | 0.75 | 1.250 | 1° 15' 00" |
|                    | ST | 4061+89.52 |    |    |      |       |            |
| 3.1.105            | TS | 4063+39.56 | 50 | 40 | 2.25 | 3.017 | 3° 01' 00" |
|                    | ST | 4076+24.63 |    |    |      |       |            |
| 3.1.106            | TS | 4087+27.41 | 60 | 40 | 0.50 | 1.000 | 1° 00' 00" |
|                    | ST | 4121+37.52 |    |    |      |       |            |
| 3.1.107            | TS | 4144+35.64 | 60 | 40 | 0.50 | 1.000 | 1° 00' 00" |
|                    | ST | 4164+86.03 |    |    |      |       |            |
| 3.1.108            | TS | 4177+34.62 | 60 | 40 | 0.50 | 1.000 | 1° 00' 00" |
|                    | ST | 4187+24.75 |    |    |      |       |            |
| 3.1.109            | TS | 4247+79.55 | 55 | 40 | 0.75 | 2.000 | 2° 00' 00" |
|                    | ST | 4259+27.05 |    |    |      |       |            |
| 3.1.110            | TS | 4295+58.40 | 60 | 40 | 0.50 | 1.000 | 1° 00' 00" |
|                    | ST | 4312+01.90 |    |    |      |       |            |
| 3.1.111            | TS | 4357+03.49 | 60 | 40 | 0.50 | 1.000 | 1° 00' 00" |
|                    | ST | 4367+85.77 |    |    |      |       |            |
| 3.1.112            | TS | 4389+25.89 | 55 | 40 | 0.75 | 2.000 | 2° 00' 00" |
|                    | ST | 4405+02.23 |    |    |      |       |            |
| 3.1.113            | TS | 4426+37.62 | 60 | 40 | 0.50 | 1.500 | 1° 30' 00" |
|                    | ST | 4445+43.01 |    |    |      |       |            |
| Manchester Station |    | 4450+00    |    |    |      |       |            |
| 3.1.114            | TS | 4454+36.78 | 55 | 40 | 0.75 | 2.000 | 2° 00' 00" |
|                    | ST | 4466+52.32 |    |    |      |       |            |
| 3.1.115            | TS | 4479+95.30 | 50 | 40 | 2.00 | 3.000 | 3° 00' 00" |
|                    | ST | 4508+43.96 |    |    |      |       |            |
| 3.1.116            | TS | 4511+85.96 | 55 | 40 | 0.75 | 2.000 | 2° 00' 00" |
|                    | ST | 4539+70.40 |    |    |      |       |            |
| 3.1.117            | TS | 4576+45.99 | 55 | 40 | 0.75 | 2.000 | 2° 00' 00" |
|                    | ST | 4586+18.42 |    |    |      |       |            |

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|-------------------------|-----|------------|----|----|-----------------------|-------|------------|
| 3.1.118                 | TS  | 4607+79.18 | 55 | 40 | 0.75                  | 2.000 | 2° 00' 00" |
|                         | ST  | 4624+40.32 |    |    |                       |       |            |
| 3.1.119                 | TS  | 4644+15.28 | 55 | 40 | 1.50                  | 2.500 | 2° 30' 00" |
|                         | ST  | 4659+93.79 |    |    |                       |       |            |
| 3.1.120                 | TS  | 4675+93.58 | 60 | 40 | 0.50                  | 1.000 | 1° 00' 00" |
|                         | ST  | 4704+51.96 |    |    |                       |       |            |
| 3.1.121                 | TS  | 4777+78.29 | 60 | 40 | 0.50                  | 1.000 | 1° 00' 00" |
|                         | ST  | 4791+15.79 |    |    |                       |       |            |
| 3.1.122                 | TS  | 4833+92.22 | 60 | 40 | 0.50                  | 1.500 | 1° 30' 00" |
|                         | ST  | 4869+29.73 |    |    |                       |       |            |
| 3.1.123                 | TS  | 4877+84.22 | 50 | 40 | 3.25                  | 4.000 | 4° 00' 00" |
|                         | ST  | 4896+56.65 |    |    |                       |       |            |
| 3.1.124                 | TS  | 4901+57.37 | 55 | 40 | 1.00                  | 2.000 | 2° 00' 00" |
|                         | ST  | 4909+62.23 |    |    |                       |       |            |
| 3.1.125                 | TS  | 4915+17.38 | 35 | 35 | 1.50                  | 3.750 | 3° 45' 00" |
|                         | ST  | 4920+64.65 |    |    |                       |       |            |
| 3.1.126                 | TS  | 4921+69.73 | 30 | 30 | 0.50                  | 3.000 | 3° 00' 00" |
|                         | ST  | 4932+64.15 |    |    |                       |       |            |
| 3.1.127                 | TS  | 4945+63.50 | 50 | 40 | 2.00                  | 3.000 | 3° 00' 00" |
|                         | ST  | 4952+82.57 |    |    |                       |       |            |
| 3.1.128                 | TS  | 4960+24.07 | 60 | 40 | 0.50                  | 0.750 | 0° 45' 00" |
|                         | ST  | 4965+71.43 |    |    |                       |       |            |
| 3.1.129                 | TS  | 5022+11.70 | 60 | 40 | 0.50                  | 1.500 | 1° 30' 00" |
|                         | ST  | 5033+87.77 |    |    |                       |       |            |
| 3.1.130                 | TS  | 5051+01.71 | 60 | 40 | 0.50                  | 1.500 | 1° 30' 00" |
|                         | ST  | 5057+78.72 |    |    |                       |       |            |
| Proposed #20<br>Turnout | PS  | 5166+68.25 | 45 | 40 | Begin Proposed Siding |       |            |
|                         | PI  | 5167+26.49 |    |    |                       |       |            |
|                         | LLT | 5168+86.96 |    |    |                       |       |            |
| Proposed #20<br>Turnout | LLT | 5197+50.20 | 45 | 40 | End Proposed Siding   |       |            |
|                         | PI  | 5199+10.66 |    |    |                       |       |            |
|                         | PS  | 5199+68.91 |    |    |                       |       |            |
| 3.1.131                 | TS  | 5096+03.61 | 60 | 40 | 0.50                  | 1.000 | 1° 00' 00" |
|                         | ST  | 5106+17.85 |    |    |                       |       |            |
| 3.1.132                 | TS  | 5226+11.01 | 55 | 40 | 1.50                  | 2.500 | 2° 30' 00" |
|                         | ST  | 5238+40.05 |    |    |                       |       |            |
| 3.1.133                 | TS  | 5246+18.63 | 50 | 40 | 2.00                  | 3.000 | 3° 00' 00" |
|                         | ST  | 5260+01.12 |    |    |                       |       |            |
| 3.1.134                 | TS  | 5303+11.54 | 40 | 40 | 1.50                  | 3.000 | 3° 00' 00" |
|                         | ST  | 5318+69.01 |    |    |                       |       |            |
| 3.1.135                 | TS  | 5328+54.13 | 35 | 35 | 1.50                  | 3.500 | 3° 30' 00" |
|                         | ST  | 5335+15.65 |    |    |                       |       |            |
| 3.1.136                 | TS  | 5336+20.38 | 55 | 40 | 1.50                  | 2.500 | 2° 30' 00" |
|                         | ST  | 5341+28.71 |    |    |                       |       |            |
| 3.1.137                 | TS  | 5349+14.99 | 55 | 40 | 0.75                  | 2.000 | 2° 00' 00" |
|                         | ST  | 5361+72.96 |    |    |                       |       |            |

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|---------------------|-----|------------|----|----|------|--------|-------------|
| 3.1.138             | TS  | 5398+99.00 | 60 | 40 | 0.50 | 1.500  | 1° 30' 00"  |
|                     | ST  | 5411+02.87 |    |    |      |        |             |
| 3.1.139             | TS  | 5431+83.22 | 40 | 35 | 2.00 | 2.500  | 2° 30' 00"  |
|                     | ST  | 5439+35.27 |    |    |      |        |             |
| 3.1.140             | TS  | 5441+31.26 | 30 | 30 | 0.50 | 3.000  | 3° 00' 00"  |
|                     | ST  | 5449+74.27 |    |    |      |        |             |
| 3.1.141             | TS  | 5451+32.28 | 60 | 40 | 0.50 | 1.000  | 1° 00' 00"  |
|                     | ST  | 5458+41.00 |    |    |      |        |             |
| 3.1.142             | TS  | 5490+79.39 | 60 | 40 | 0.50 | 1.000  | 1° 00' 00"  |
|                     | ST  | 5496+79.20 |    |    |      |        |             |
| 3.1.143             | TS  | 5520+22.73 | 60 | 40 | 0.50 | 1.000  | 1° 00' 00"  |
|                     | ST  | 5534+82.85 |    |    |      |        |             |
| 3.1.144             | TS  | 5560+78.98 | 60 | 40 | 0.50 | 1.750  | 1° 45' 00"  |
|                     | ST  | 5577+40.50 |    |    |      |        |             |
| 3.1.145             | TS  | 5584+90.75 | 60 | 40 | 0.50 | 1.000  | 1° 00' 00"  |
|                     | ST  | 5602+64.32 |    |    |      |        |             |
| 3.1.146             | TS  | 5622+45.96 | 60 | 40 | 0.50 | 1.500  | 1° 30' 00"  |
|                     | ST  | 5631+63.31 |    |    |      |        |             |
| 3.1.147             | TS  | 5652+13.41 | 60 | 40 | 0.50 | 1.000  | 1° 00' 00"  |
|                     | ST  | 5664+89.65 |    |    |      |        |             |
| 3.1.148             | TS  | 5666+25.40 | 60 | 40 | 0.50 | 1.000  | 1° 00' 00"  |
|                     | ST  | 5677+94.51 |    |    |      |        |             |
| 3.1.149             | TS  | 5705+85.96 | 50 | 40 | 0.75 | 2.000  | 2° 00' 00"  |
|                     | ST  | 5725+41.27 |    |    |      |        |             |
| 3.1.150             | TS  | 5755+86.43 | 40 | 35 | 1.25 | 3.000  | 3° 00' 00"  |
|                     | ST  | 5766+27.70 |    |    |      |        |             |
| 3.1.151             | TS  | 5767+62.44 | 50 | 40 | 2.00 | 3.000  | 3° 00' 00"  |
|                     | ST  | 5776+71.20 |    |    |      |        |             |
| 3.1.152             | TS  | 5786+02.37 | 55 | 40 | 0.75 | 2.000  | 2° 00' 00"  |
|                     | ST  | 5795+63.89 |    |    |      |        |             |
| 3.1.153             | TS  | 5800+30.51 | 40 | 40 | 1.75 | 2.333  | 2° 20' 00"  |
|                     | ST  | 5823+51.41 |    |    |      |        |             |
| 3.1.154             | TS  | 5834+59.91 | 40 | 40 | 1.25 | 2.500  | 2° 30' 00"  |
|                     | ST  | 5850+58.54 |    |    |      |        |             |
| 3.1.155             | TS  | 5851+86.11 | 60 | 40 | 0.50 | 1.500  | 1° 30' 00"  |
|                     | ST  | 5860+63.16 |    |    |      |        |             |
| 3.1.156             | TS  | 5877+13.32 | 45 | 25 | 0.50 | 1.000  | 1° 00' 00"  |
|                     | ST  | 5884+50.11 |    |    |      |        |             |
| 3.1.157             | TS  | 6126+24.55 | 30 | 15 | 0.50 | 2.500  | 2° 30' 00"  |
|                     | ST  | 6128+16.87 |    |    |      |        |             |
| 3.1.158             | TS  | 6134+70.49 | 15 | 10 | 0.00 | 12.000 | 12° 00' 00" |
|                     | ST  | 6146+04.30 |    |    |      |        |             |
| Existing<br>Turnout | LLT | 6146+08.10 | 15 | 15 | 0    |        |             |
|                     | PI  | 6146+87.66 |    |    |      |        |             |
|                     | PS  | 6147+17.56 |    |    |      |        |             |
| 3.1.159             | PC  | 6147+36.63 | 15 | 10 | 0.00 | 12.000 | 12° 00' 00" |
|                     | PT  | 6152+04.99 |    |    |      |        |             |

NY-VT BI-STATE  
INTERCITY PASSENGER RAIL STUDY

|                        |    |                   |    |    |      |        |             |
|------------------------|----|-------------------|----|----|------|--------|-------------|
| 3.1.160                | TS | <u>6152+92.93</u> | 20 | 15 | 0.75 | 10.929 | 10° 55' 45" |
|                        | ST | 6158+75.33        |    |    |      |        |             |
| 3.1.161                | TS | <u>6160+60.90</u> | 15 | 15 | 0.25 | 4.775  | 4° 46' 30"  |
|                        | ST | 6163+58.08        |    |    |      |        |             |
| 3.1.162                | TS | <u>6164+43.33</u> | 15 | 15 | 0.75 | 11.000 | 11° 00' 00" |
|                        | ST | 6167+13.06        |    |    |      |        |             |
| <b>Rutland Station</b> |    | 6167+13.06        |    |    |      |        |             |

Curve on siding at STA 3115+00 not concentric with main track (Compound Curve)

|                  |               |               |               |
|------------------|---------------|---------------|---------------|
| Curve Speed      | PS 3115+84.64 | SC 3119+35.59 | CS 3134+77.89 |
| freight = 40 MPH | PI 3116+42.88 | CS 3122+67.43 | ST 3137+57.62 |
| pass = 45 MPH    | TS 3118+49.42 | SC 3125+19.59 |               |







**AGREEMENT FOR THE PROVISION OF RAIL PASSENGER SERVICE**

Between The

**NATIONAL RAILROAD PASSENGER CORPORATION**

And The

**STATE OF INDIANA**

**October 1, 2013 Through September 30, 2014**

Indiana EDS No. A249-14-320314A

THIS AGREEMENT, herein referred to as the "Agreement," is made as of the 1st day of October, 2013 between the National Railroad Passenger Corporation, a corporation organized under federal law and the laws of the District of Columbia and having its principal place of business in Washington, D.C. ("Amtrak") and the State of Indiana acting by and through the Indiana Department of Transportation (the "State" or "INDOT").

WHEREAS, the STATE has determined a need to grant funds to Amtrak to provide rail passenger service as described herein and reasonably expects sufficient funds to be made available to pay for such service, and that it is authorized by law to enter into this Agreement; and

WHEREAS, under Section 209 of the Passenger Rail Investment and Improvement Act of 2008, Pub. L. No. 110-432, 122 Stat. 4848 ("PRIIA"), Congress required, among other things, that Amtrak, in consultation with the relevant states and the District of Columbia, develop and implement a methodology for allocating the operating and capital costs of rail routes of not more than 750 miles outside the segment of the continuous Northeast Corridor railroad line between Boston, Massachusetts and Washington, District of Columbia among the relevant states and the District of Columbia, and Amtrak; and

WHEREAS, Amtrak developed such a methodology in consultation with a group of states, but was unable to achieve the necessary concurrence on the methodology from all relevant states and the District of Columbia as required by PRIIA. Accordingly, on November 21, 2011, Amtrak petitioned the Surface Transportation Board (the "STB") to adopt Amtrak's proposed methodology; and

WHEREAS, in a decision effective April 14, 2012, the STB adopted Amtrak's proposed methodology to meet the requirements of PRIIA (the "Agreed 209 Methodology"), which decision is attached hereto and incorporated herein as **Appendix V**; and

WHEREAS, the purpose of this Agreement is to provide for an Indiana based system of intercity railroad passenger trains in connection with Amtrak's nationwide system, such system to operate for the benefit of Indiana residents and passengers connecting to interstate Amtrak trains; and

WHEREAS, the intercity railroad passenger service covered by this Agreement consists of one round-trip, four days per week (*Hoosier State Service* – Trains 850 and 851) between Chicago, Illinois and Indianapolis, IN, collectively referred to herein as the “Hoosier State Service”; and

WHEREAS, the Hoosier State Service is subject to the Agreed 209 Methodology; and

WHEREAS, the Hoosier State Service plays an important role in the effective operation of Amtrak's Beech Grove, Indiana heavy maintenance shop by ferrying rolling stock between Chicago and Beech Grove; and

WHEREAS, the State of Indiana, in conjunction with certain local units of government that are served by the Hoosier State Service, support a multimodal transportation system that includes passenger rail as a sustainable service option; and

WHEREAS, the State and its local partners have agreed to grant funds to Amtrak to continue operation of rail passenger service on the Hoosier State Service as described herein, and reasonably expects sufficient funds to be made available to pay for such service; and

WHEREAS, though the State and its local partners wish for the Hoosier State Service to continue, the State believes that the current operating and funding model can be improved through collaboration among the State, Amtrak and applicable host freight railroads in order to achieve a viable long-term solution for the successful operation of the Hoosier State Service and passenger rail service in Indiana; and

WHEREAS, the State expects Amtrak work collaboratively with the State, local communities, and other parties as may be mutually agreed upon by Amtrak and the State, to achieve certain measureable improvements to the level of Hoosier State Service (as defined herein) as a return on the tax dollars being invested to continue service;

NOW THEREFORE, the State will grant the funds provided by this Agreement to Amtrak subject to the following conditions:

**Section 1. Service to be Provided and Permissible Expenditures of Funds.**

(a.) Subject to sufficient appropriation of Federal funding for Amtrak, the term of this Agreement is for twelve (12) months commencing October 1, 2013, over the route(s), serving the stations, and substantially in accordance with the schedules and other criteria set forth below next to each route description, with the intermediate stops set forth in **Appendix I** to this Agreement, unless the State gives its prior written approval to any deviation from such parameters. In the event Federal funding for Amtrak

for federal fiscal year 2014 is insufficient to support the national system, Amtrak may terminate this Agreement on thirty (30) days prior written notice to the State. The State may terminate this Agreement on thirty (30) days prior written notice to Amtrak.

**(b.)** Amtrak shall not be required to provide service on any other route, or to increase any train frequency or train consist, except pursuant to a mutually agreed upon amendment hereto, consistent with the Agreed 209 Methodology.

**(c.)** Amtrak will make available to the Hoosier State Service sufficient locomotives and cars so as to operate the Service according to the schedules and other criteria established by this Agreement consistent with the funding requirements of the Agreed 209 Methodology. The operating conditions of said locomotives and cars shall be in compliance with standards established under Federal laws and regulations. Amtrak will provide operating crews (including sufficient numbers of employees, as provided under applicable regulations and Amtrak labor agreements), reservation and information services, station facilities and agents at agreed-upon stations in the Hoosier State Service. Any and all station staffing to be implemented during the term of this Agreement shall require mutual written approval of the parties, and must, as applicable, be in full compliance with all existing Amtrak labor agreements. All trains in the Hoosier State Service will be dispatched in a right and ready condition. All trains shall, at a minimum, consist of one locomotive and two passenger coach cars. Coach cars shall have accommodations for passenger hand-carried luggage. Amtrak shall comply with the requirements of the Americans With Disabilities Act in its performance of these services.

**(d.)** The parties shall cooperate for the purpose of promoting the Hoosier State Service, and shall take such other actions as they may agree are conducive to the provision of the Hoosier State Service on a regular, efficient and economical basis; provided, however, that the State shall have no obligation to contribute moneys for that purpose or for purposes other than those set forth in Section 3 of this Agreement. Amtrak shall advertise and market the Hoosier State Service and may incorporate the Hoosier State Service in its general advertising and promotional programs, as it deems appropriate. Amtrak will, as practical, endeavor to provide the State with advance notice of future promotions and obtain State concurrence on special promotions relating to the Hoosier State Service.

**(e.)** Amtrak shall insert in all published timetables the following statement: "This service is financed primarily through funds made available by the Indiana Department of Transportation and communities along the route."

**(f.)** Amtrak's obligations to provide the Hoosier State Service shall not be deemed to be satisfied through the operation of other regularly scheduled interstate trains. This Agreement shall not prevent Amtrak from altering or terminating any other service it provides.

(g.) Amtrak recognizes the State's financial contribution to the provision of the Hoosier State Service and acknowledges the budgetary limitations of the State. Amtrak further recognizes that reducing cost whenever possible is important to the State. Accordingly, the parties acknowledge that it is their mutual objective to provide the citizens of the State with a quality transportation service, operated in a cost effective manner. In accordance with this objective, Amtrak commits that it will endeavor to work with the State to pursue revenue growth and to achieve cost efficiencies and/or cost reduction in the operation of the Hoosier State Service, as appropriate.

**Section 2. Changes Affecting Hoosier State Service.**

(a.) The State may at any time request changes in any aspect of the Hoosier State Service by giving written notice of such request to Amtrak. Such notice shall be faxed and sent registered mail with confirmed delivery and shall contain a proposed date of implementation and information in sufficient detail to support and justify the proposed change. Amtrak's response shall state that it concurs or, in the alternative, give reasons in sufficient detail why it does not concur with the proposed change, such concurrence not to be unreasonably withheld. If Amtrak fails to respond in writing within sixty (60) days of receipt of such notice, it shall be deemed to have concurred in the proposed change. If after consultation the parties cannot agree, either may initiate the dispute resolution provisions of Section 9 hereof.

(b.) Amtrak may at any time request changes in any aspect of the Hoosier State Service by giving written notice of such request to the State. Such notice shall be faxed and sent registered mail with confirmed delivery and shall contain a proposed date of implementation and information in sufficient detail to support and justify the proposed change. The State's response shall state that it concurs or, in the alternative, give reasons in sufficient detail why it does not concur with the proposed change, such concurrence not to be unreasonably withheld. If the State fails to respond in writing within sixty (60) days of receipt of such notice, it shall be deemed to have concurred in the proposed change. If after consultation the parties cannot agree, either may initiate the dispute resolution provisions of Section 9 hereof.

(c.) If Amtrak operation on, or access to or over, required rail lines shall be disrupted or unavailable for any reason, including force majeure as set forth in Section 6 herein, Amtrak may suspend or reroute any part of the Hoosier State Service or use buses instead of trains for so long as such operation or access is disrupted or unavailable. In such cases Amtrak shall take all reasonable measures to promptly notify the State, by telephone at (317) 233-2376, of any such suspension or rerouting or bus usage. Amtrak agrees to involve State in any decisions it reaches with the host railroad should the host railroad refuse to reasonably provide access to its tracks before, during or after a disruption under this section. Amtrak and State also agree to take all reasonable measures to defend Amtrak's right of access to the host railroad's tracks.

- (i.) Amtrak and the State agree that they shall cooperate for the purpose of mitigating the impact of service disruptions by alerting passengers, the appropriate stations and the public through appropriate public media.
- (d.) Amtrak may at any time, with or without the State's concurrence, make changes in the Hoosier State Service that are, in its opinion, necessary for safety, environmental, or federal regulatory reasons. Amtrak shall promptly notify the State of any such changes. Said changes include, but are not limited to, compliance with rulings by the Federal Railroad Administration, the Department of Homeland Security, the National Transportation Safety Board, the Food and Drug Administration or the Environmental Protection Agency.
- (e.) Any changes to the Hoosier State Service made pursuant to subsections (a), (b), (c) or (d) above may, if agreed to in writing between the parties, result in an adjustment of the amounts paid by the State consistent with the Agreed 209 Methodology.

**Section 3. Amount and Timing of Funds by the State.**

(a.) The State shall pay Amtrak the following for operation of the Hoosier State Service each month from October 1, 2013 through September 30, 2014:

(i.) The sum of Two Hundred Forty-Four Thousand and Nine Hundred and Sixteen Dollars (**\$244,916.00**) per month, calculated in accordance with the Agreed 209 Methodology and representing a fixed fee for the entire cost of the service, including Third Party Costs for Fuel, Host Railroad Maintenance of Way, Performance Incentive and Other Costs and Capital Costs – Passenger Service Equipment. The State and Amtrak agree that this amount represents a fixed fee for the Service, mutually agreed upon by the parties and not subject to audit adjustment.

(ii.) The parties further agree that in accordance with the provisions of Section 3(b) below, the State's monthly payment to Amtrak for Hoosier State Service each month from October 1, 2013 through September 30, 2014, as provided by Section 3(a)(i) above, shall be offset, in part, by a monthly credit in the amount of Twenty-One Thousand and Six Hundred and Sixty-Seven Dollars (**\$21,667.00**). The parties further agree that the State shall be entitled to such credit only for each full month of service during which the State-supported Hoosier State Service is operated.

(iii) Capitalized terms shall have the meaning set forth in the Agreed 209 Methodology.

(1.) **Operating Costs – general.** Operating Costs will be calculated according to the Agreed 209 Methodology. Route Costs and Additives, and Third Party Costs shall be

fixed for the term of the Agreement based upon a monthly pro-rata allocation of the amounts specified in Appendix II. Credits for Passenger and Other Allocated Revenues shall be fixed for the duration of the Agreement in the amounts specified in Appendix II. The State and Amtrak agree that the Route Costs and Additives, Third Party Costs and Passenger and Other Allocated Revenues for the Hoosier State Service have been mutually agreed upon by the parties and are not subject to audit adjustment.

(2.) Capital Costs – Passenger Service Equipment. Capital Costs for Passenger Service Equipment are included in this Agreement and will be calculated as a usage fee according to the Agreed 209 Methodology and will be charged to the State on a monthly pro-rata allocation of the amount specified in Appendix III. On or before March 1, 2015, Amtrak shall provide the State with an accounting of the actual and verifiable equipment capital investments made by Amtrak during the period of October 1, 2013 through September 30, 2014 and if applicable, the Continuation Period set forth in Section 3(f), in accordance with the 5-year equipment capital investment program described in the Agreed 209 Methodology, along with the revised FY 2014 Equipment Capital Charge based on that accounting.

(b.) Amtrak may add units of rolling stock, either locomotives or railcars, to the Hoosier State Service to be transported from Chicago to Indianapolis or from Indianapolis to Chicago (i) for the purpose of moving said rolling stock from or to Amtrak's Beech Grove shop, or (ii) for any purpose other than transporting passengers as part of the Hoosier State Service ("Additional Units"). Amtrak anticipates that it shall add no more than five hundred twenty (520) units to the Hoosier State Service in Fiscal Year 2014. The State shall be permitted to deduct a credit of Twenty-One Thousand and Six Hundred and Sixty-Seven Dollars (\$21,667.00) (or approximately Five Hundred Dollars (\$500.00) per unit) per month from the bill for making the State-supported train available for these movements. Subject to the provisions of Section 3(a)(ii) above, this credit shall be available to the State only for each full month during which the State-supported Hoosier State Service is operated.

(c.) The State shall remit to Amtrak timely monthly payments in accordance with the Payment Schedule set forth in Appendix IV. All monthly payments due under Section 3(a) shall be payable to Amtrak, in full, forty-five (45) days after first of each month for service provided during the preceding month.

(d.) Any such payment that is due on a date that precedes the actual execution of this Agreement shall be due and payable forty-five (45) days after the date of such execution. Except for any such payments due on the date of execution hereof, the State shall remit to Amtrak all contractually due

amounts under Section 3(a) in accordance with the monthly payment schedule specified above and presented in **Appendix IV** to this Agreement. If the State fails to remit full payment when due, Amtrak may discontinue any or all of the Hoosier State Service after thirty (30) days prior notice in writing to the State.

(e.) Any termination hereunder shall be without prejudice to Amtrak's right to receive payment through the date of actual termination of the Hoosier State Service, and shall be without prejudice to the State's right to receive a credit for movement of Additional Units on the Hoosier State Service for each full month of service for which the Hoosier State Service was operated.

(f.) All payments shall be made in arrears and according to the terms of this Agreement and in conformance with State fiscal policies and procedures and, as required by IC 4-13-2-14.8, by electronic funds transfer to the financial institution designated by Amtrak in writing unless a specific waiver has been obtained from the Indiana Auditor of State. No payments will be made in advance of receipt of the services that are the subject of this Agreement except as permitted by IC 4-13-2-20.

(g.) In the event the parties fail to reach agreement for operation of the Service for the period beyond September 30, 2014, the parties agree that the terms of this Agreement shall govern continued operation of the Hoosier State Service for a one-time extension period of up to an additional four (4) months ("Continuation Period"). In such event, the State agrees to reimburse Amtrak for the fixed fee, at the level established for the period October 1, 2013 through September 30, 2014, plus a three percent (3%) escalation fee, subject to Section 21 (Funding Cancellation) of this Agreement. Under no circumstances will the Continuation Period extend beyond January 31, 2015.

(h.) From time to time, Amtrak may make updates to the Amtrak Performance Tracking (APT) system which is the basis of many cost allocations within the Agreed 209 Methodology, or may make updates to Operating or Capital Cost forecasts derived from APT data. In the event any such updates are, consistent with the requirements of Section 209 Methodology, determined by Amtrak to warrant the revision of any such costs in a manner that would result in an adjustment of the amounts paid by or to be paid by the State under the terms of this Agreement, Amtrak will notify the State of such adjustment(s) and, subject to mutual agreement of the parties, amend this Agreement accordingly.

(i.) The total amount of funds paid from INDOT to Amtrak under this Agreement shall not exceed the sum of Three Million Six Hundred Five Thousand Dollars (**\$3,605,000.00**).

#### **Section 4. Indemnity and Defense.**

Amtrak shall assume all liability, defend, indemnify and hold harmless the State of Indiana, INDOT, their officials, and employees from any and all losses or expenses (including reasonable attorney's fees

incurred in enforcing this section), arising from claims, actions, or proceedings for injury to or death of any person or for damage to or loss of any property arising from the operation of the Hoosier State Service. If any claim, action or proceeding shall at any time be brought against the State asserting a liability for such injury, death, damage or loss, the State shall promptly give notice thereof to Amtrak, and Amtrak shall promptly undertake the defense of such claim, action or proceeding. The State agrees to thereafter provide such information and reasonable assistance as Amtrak may request from time to time, provided that all such requests comport with Indiana law. The State shall not provide such indemnification to Amtrak.

**Section 5. Inspections.**

(a.) The State may, at any reasonable time and upon three (3) business days' notice, inspect Amtrak's facilities and equipment used in providing the Hoosier State Service; provided, that such inspection shall comply with all applicable safety rules and regulations and shall not hinder or delay the operation of the service. Subject to compliance with Amtrak's policies on locomotive access, this will include authority to ride the head end or locomotive of State-supported trains for those State employees or approved representatives listed on Appendix VI of this Agreement. Amtrak will provide the State employees or approved representatives authorized under Appendix VI with all necessary safety equipment, other than protective footwear. The State agrees to notify Amtrak in advance of its employees' or approved representatives' intent to ride the head end or locomotive of State-supported trains, and to require that those employees or approved representatives sign a waiver releasing Amtrak from any liability that may result therefrom. The State will provide written notice to Amtrak of any requested changes to this list during the term of this Agreement as soon as possible. Amtrak will provide its approval or rejection of the request as soon as possible.

(b.) Upon ten (10) business days' written notice, Amtrak shall permit the State, or a designated representative, access to inspect all books, records and supporting documents relating to the Hoosier State Service only to verify the payments made and credits applied under Section 8 of this Agreement. Amtrak agrees to cooperate fully with any such audit conducted by the State, and to provide full access to all relevant materials, but only to the extent necessary to verify payments made and credits applied under Section 8 of this Agreement. Amtrak further agrees that all such books, records, and supporting documents shall be maintained by Amtrak and shall be accessible to the State for three (3) years following expiration of the Hoosier State Service provided for in this Agreement. All such financial information made available to the State shall be deemed to be a trade secret, or to contain proprietary, privileged or confidential information. Subject to applicable law, no other use of such information shall be made without Amtrak's express written approval.

(c.) Amtrak shall provide the State with access to daily "Delay Reports" for each train within the

Hoosier State Service. In addition, Amtrak shall also provide the State with monthly on time performance results for the Hoosier State Service, which shall include, without limitation, daily on time performance data for each train listed in **Appendix I** to include delay by railroad, delay code or causation, minutes of delay and rank of each category in terms of percentage of delay attributed. Amtrak monthly reports will also include daily counts of passengers boarding and alighting at each station, and the daily car count for Hoosier State Service trains. Amtrak will make individual conductor delay reports available to the State upon request and upon five (5) business days notice.

(d.) Amtrak shall make available to the State such ridership data relating to the Hoosier State Service that is available in Amtrak's Data Warehouse system, e.g., passengers carried, revenues and passenger miles, as may be mutually agreed upon by the parties. Such data shall be computed and furnished on a monthly basis. Amtrak shall endeavor to provide such other performance data relating to the Hoosier State Service as may be reasonably available.

#### **Section 6. Force Majeure.**

The obligations of Amtrak hereunder shall be subject to force majeure. Amtrak shall not be liable for any failure to perform, or for any delay or cancellation in connection with the performance of any obligation hereunder, if such failure, delay or cancellation occurs due to causes beyond the control and without fault or negligence of Amtrak, including but not restricted to the following: acts of God; riots, insurrection, terrorism or war; or strikes or picketing. If, because of an event of force majeure, Amtrak is unable to carry out its obligations under this Agreement, then its obligation shall be suspended to the extent made necessary by such force majeure and during its continuance. Amtrak promptly shall give the State written notice of such force majeure with sufficient details as to the extent and probable duration of the effects. Amtrak shall mitigate the effects of such force majeure (other than strikes or lockouts, which shall be wholly at the discretion of Amtrak) insofar as is commercially reasonable, with all reasonable dispatch.

#### **Section 7. Termination.**

In addition to any other provision hereof, this Agreement may be terminated by either party upon one hundred and eighty (180) days' notice to the other. Termination of this Agreement shall be without prejudice to the State's obligation to reimburse Amtrak hereunder for the Hoosier State Service and for any associated capital or other costs, provided until and including the date of termination.

#### **Section 8. Pay For Performance.**

Because timeliness of train operations is of the essence of this Agreement and actual damages to the State as a result of delays or cancellations are not readily calculable, Amtrak shall pay the State, at the end of the Agreement Term the sum of Five Thousand Dollars (**\$5,000.00**) for each Hoosier State Service train that is cancelled (annulled) before departing its origin point, as set forth in **Appendix I**, for reasons other than those set forth in Section 2(c), 2(d) or Section 6 hereof, and for which substitute transportation

(e.g., bus) is not provided. Amtrak will mitigate the effects of such suspension insofar as is commercially reasonable with all reasonable dispatch. For all service disruptions, Amtrak will coordinate with the State and will alert the passengers and public through appropriate public media.

**Section 9. Dispute Resolution.**

Any controversy or claim arising out of or relating to this Agreement, or the breach thereof, may be settled by arbitration upon written agreement of the parties. If the parties agree in writing, such arbitration shall be administered by the American Arbitration Association under its Commercial Arbitration Rules, and a judgment on the award rendered by the arbitrators may be entered in either the United States District Court for the Southern District of Indiana or the United States District Court for the Northern District of Indiana. If the parties do not agree in writing to submit to arbitration, they may instead participate in mediation or another dispute resolution procedure to resolve any controversy or claim arising out of or relating to this Agreement.

**Section 10. Notices.**

Any notices required by this Agreement or related to the Hoosier State Service provided for under this Agreement by either party shall be in writing and shall be directed to the officials identified herein by personal delivery or by deposit in the United States mail, certified first class delivery. The representatives, and/or addresses set forth herein may be changed at any time by either party by notice in writing to the other.

**For Amtrak:** Chief, State Government - Contracts  
National Railroad Passenger Corporation  
Chicago Union Station  
500 West Jackson Boulevard, 2<sup>nd</sup> Floor  
Chicago IL 60661

**For State:** Indiana Department of Transportation  
Attn: Director of Multimodal Planning and Programs  
100 N. Senate Avenue, Room N758  
Indianapolis, IN 46204-2216

**Section 11. Entire Agreement; Amendment.**

This Agreement constitutes the entire agreement between the parties with respect to the subject of rail passenger service on the route covered herein. There are no agreements, whether express or implied, except as may be expressly set forth herein. All prior agreements and understandings between them with respect to the provision of rail passenger service on the route covered herein on or after the effective date of this Agreement or any renewal thereof are subsumed within this Agreement and any renewal thereof. No change in or modification to this Agreement shall be of any force or effect unless in writing, dated and

executed by duly authorized representatives of the parties, and submitted to the Attorney General of Indiana or his or her authorized representative for approval as to form and legality.

**Section 12. Construction/Governing Laws.**

This Agreement shall be governed, construed and enforced in accordance with the laws of the State of Indiana, without regard to its conflicts of laws rules. Suit, if any, must be brought in the State of Indiana. The parties further agree that the Section headings used in this Agreement are for convenience only and shall not affect the construction of any terms hereof.

**Section 13. Confidentiality.**

State desires that Amtrak disclose to State certain proprietary and confidential commercial and financial information of Amtrak pursuant to this Agreement and the Operations provided hereunder. Except as otherwise provided in this Section 13, the State agrees to keep such confidential information in strict confidence, to maintain adequate security measures to protect the information and to immediately notify Amtrak in writing of any known or suspected disclosure, access or use of the confidential information that is not authorized under this Agreement. Further, State agrees that it and its employees, will not, either during or at any time after the term of this Agreement, publish or disclose to any third party or the public any identified Amtrak proprietary or confidential information of any kind or nature disclosed by Amtrak to State hereunder without the prior written authorization of Amtrak, except as may be required and with written notice to Amtrak prior to disclosure : (i) pursuant to the Indiana Access to Public Records Act, I.C. 5-14-3; or (ii) by order or decree of any court or other governmental body having powers to compel testimony or production of information. This Section shall survive termination or expiration of this Agreement.

**Section 14. Subcontracting.**

Subcontracting, assignment or transfer of all or part of the interests of the State concerning any of the obligations covered by this Agreement is prohibited without prior written consent of the State.

**Section 15. Third Party Contractors.**

(a.) The State may elect to contract with third parties for certain services provided by Amtrak under this Agreement, as specifically set forth below. If State elects to contract with a third party for any of the services described In Section 15(c) below, it will provide ninety (90) days prior written notice to Amtrak of its intent to issue a Request for Proposals (RFP). Amtrak will be permitted to respond to the RFP along with other proposers, who will be qualified by the State at the State's sole discretion. The State shall provide at least ninety (90) days prior written notice to Amtrak of its intention to substitute a third party contractor for any of the Amtrak provided services described below. Within forty-five (45) business days of receipt of such notice, Amtrak shall provide the State with its requirements for indemnity, insurance, labor, regulatory, health and safety obligations. Except as may be prohibited under applicable state or

federal law, the State will encourage the third party contractor to employ furloughed Amtrak employees, if applicable.

**(b.)** Subject to the provisions of Section 2 (e) above and as specified in Section 15 (c) below, any changes to the Hoosier State Service may, if agreed to in writing between the parties, result in an adjustment of the amounts paid by the State consistent with the Agreed 209 Methodology.

**(c.)** State, at its sole option, may provide any or all of the following upon completion of an RFP process and selection of a third party contractor ("Contractor"):

i. At any time during the term of this Agreement, the State may decide to introduce food and beverage service for the Amtrak Hoosier State Service. The State shall provide Amtrak with at least ninety (90) days' prior written notice of the proposed date of implementation any food service on Amtrak Hoosier State Service. Such food and beverage service to be provided by the State must meet all federal, state and local laws, rules and regulations relating to food and beverage service, including but not limited to the Food and Drug Administration and Amtrak's Food Service Sanitation and Public Health standards. Revenue generated from the State's Contractor, and any additional Amtrak costs associated with the introduction of food and beverage service aboard Amtrak Hoosier State Service will be addressed in accordance with the terms set forth in a written amendment to this Agreement.

ii. Station staffing, if a Contractor is selected by the State for any unstaffed station, will be provided at the sole expense of the State with no offset in expense, as there is presently no expense for station staffing at unstaffed stations included in this Agreement. Any and all station staffing to be implemented during the term of this Agreement shall require mutual written approval of the parties, and must, as applicable, be in full compliance with all existing Amtrak labor agreements.

iii. Rolling stock, if a Contractor is selected by the State, or if the State purchases rolling stock, such equipment will be provided at the sole expense of the State. In order for State-provided equipment to operate in the Amtrak Hoosier State Service, the rolling stock provided by the State, either through ownership or Contractor(s), must comply fully with all applicable requirements of 49 CFR Part 238 and all other applicable laws and regulations, and by mutual agreement of the parties, must be compatible with Amtrak Hoosier State operations and associated equipment. The State shall provide Amtrak with at least ninety (90) days prior written notice before the planned commencement of utilizing State-owned or leased equipment

in the operation of the Hoosier State Service. Subject to Amtrak's full acceptance of such equipment for use in the operation of the Hoosier State Service, the State shall be provided with a credit against the amounts otherwise payable under Section 3(a)(iii)(2) of this Agreement, in the amount Thirty-Five Thousand, Seven Hundred and Fifty Dollars (**\$35,750.00**) per month, reflecting elimination of the Capital Cost in **Appendix III**. Such credit shall be applicable only for each full month of Hoosier State Service during which no units of Amtrak-owned equipment are provided. In the event that State-provided equipment is not available for the operation of Hoosier State Service, for any reason, and is replaced by Amtrak-owned rolling stock, the credit shall be reduced by the daily Capital Cost amount of One Thousand, One Hundred and Seventy-Five Dollars and Thirty-Five Cents (**\$1,175.35**) for each such day that any unit of Amtrak-owned rolling stock is used for the operation of the Hoosier State Service.

iv. Maintenance and Servicing of State-owned or leased rail equipment, if a Contractor is used by the State, the State will be provided with a credit against the amounts otherwise payable under Section 3(a) of this Agreement, in the amount of Thirty-Nine Thousand, Two Hundred and Fifty Dollars (**\$39,250.00**) per month. In the event that Amtrak must, for any reason, perform maintenance or servicing of the State-owned or leased equipment in the conduct of the daily operation of the Hoosier State Service, such credit shall be reduced by the amount of One Thousand, Two Hundred and Ninety Dollars and Forty-Two Cents (**\$1,290.42**) for each such day for which mechanical forces must provide mechanical maintenance and/or servicing. All such maintenance and servicing of the State-owned or leased rail equipment to be provided by a Contractor will be provided at a non-Amtrak facility and at the sole expense of the State. The State or its Contractor shall be responsible for any host railroad access arrangements to Contractor maintenance facilities. The State shall provide Amtrak at least ninety (90) days' prior written notice prior to planned commencement of equipment maintenance and servicing by a Contractor. Further, the State shall assure throughout the term of this Agreement that the Contractor(s):

1. complies fully with all applicable requirements of 49 CFR Part 238 and all other applicable laws and regulations;
2. maintains the equipment and all components (e.g., heating and cooling systems) in safe and reliable operating condition, performs repairs as needed (including any repairs or modifications required by applicable laws and regulations) and performs housekeeping functions to provide a clean and sanitary condition on the exterior and interior of the equipment, including windows ("Operational Condition");
3. delivers the needed equipment in Operational Condition to Amtrak in a timely

fashion so that Amtrak can meet the schedule set forth in Appendix I;

4. agrees to defend, indemnify and hold harmless Amtrak and any railroad over which State-owned or leased equipment is operated (each an "Operating Railroad"), their respective officers, directors, employees, agents, servants, successors, assigns and subsidiaries (collectively, "Indemnitees"), from and against any and all losses and liabilities, penalties, fines, forfeitures, demands, claims, causes of action, suits, costs, and expenses incidental thereto (including costs of defense and attorneys' fees) (collectively, "Losses"), which any or all of them may hereafter incur, be responsible for or pay as a result of injury, death, disease, or occupational disease ("Personal Injury") to any person (including Contractor's employees), and for damage to or loss (including loss of use) of any property (including property of Contractor's employees and the parties hereto) ("Property Damage"), arising out of or in any degree directly or indirectly caused by or resulting from activities of or services performed by Contractor or Contractor's officers, employees, agents, servants, subcontractors, sub-subcontractors or the employees of any of them, or any other person acting for or by permission of Contractor or Contractor's agents (collectively, "Contractor's Agents"); provided however:
  - (a) Contractor shall be obligated to defend and indemnify the Indemnitees for Losses as a result of Personal Injury to Contractor or Contractor's Agents, or the employees of any of them, and Property Damage to property of Contractor or Contractor's Agents regardless of cause or the negligence of State or Indemnitees.
  - (b) Contractor shall not be obligated to indemnify the Indemnitees for Losses as a result of Personal Injury to Amtrak employees or property damage to property of Amtrak or Amtrak employees regardless of cause or the negligence of Contractor or Contractor's Agents.
  - (c) That with respect to Losses as a result of Personal Injury or Property Damage suffered by any person or entity, other than Contractor or Contractor's Agents or State, Contractor shall not be obligated to indemnify an Indemnitee to the extent such Losses were caused by the negligence, gross negligence or willful misconduct of that Indemnitee.
  - (d) Contractor's duty to indemnify and insure the contractual liabilities assumed in this Subsection 15(c) shall not exceed Two Hundred Million Dollars (\$200,000,000.00) per occurrence and annual aggregate.
5. Where any lack of insurance coverage is due to the Contractor's failure to

procure or maintain insurance of the types and with the minimum limits required by Section 15(c) hereof, Amtrak shall have the right to halt the Service until such lack in insurance is cured. Contractor shall procure endorsements to its general liability policies that provide the following: (1) that Contractor's insurance carrier shall provide sixty (60) days' notice to Contractor, the State, Amtrak and the other Indemnitees before terminating, amending and/or canceling any specific coverages including endorsements required under Sections 15(c)(iv)(4) through 15(c)(iv)(6) hereof for any reason; (2) (a) if any named insured requests cancellation of insurance, Contractor's insurer shall immediately notify Contractor, Amtrak, the State and the Operating Railroads (in the manners and at the locations listed in the next sentence) of such request for cancellation, and (b) such insurance shall not be cancelled unless and until Contractor, Amtrak, the State and the Operating Railroads have given in writing their consent to such cancellation; and (3) that all notice contemplated by this Section shall be provided by certified mail, facsimile transmission, and electronic mail delivered as follows:

For the State: Indiana Department of Transportation  
Attn: Director of Multimodal Planning and Programs  
100 N. Senate Avenue, Room N758  
Indianapolis, IN 46204-2216

For Amtrak: Cathy H. Rawlings  
Director, Risk Management  
National Railroad Passenger Corporation  
60 Massachusetts Avenue, N.E.  
Washington, DC 20002  
Facsimile: (202) 906-2174  
Email: [cathy.rawlings@amtrak.com](mailto:cathy.rawlings@amtrak.com)

For BRC: Mr. Patrick O'Brien, President  
The Belt Railway of Chicago  
6900 S. Central Avenue  
Bedford Park, IL 60638  
Facsimile: (708) 496-4001  
Email: [pobrien@beltrailway.com](mailto:pobrien@beltrailway.com)

For CSX: Mr. Jay Westbrook  
AVP Network Planning & Joint Facility  
CSX Transportation  
500 Water Street, J-315  
Jacksonville, FL 32202  
Facsimile: (904) 359-4807  
Email: [jay\\_westbrook@csx.com](mailto:jay_westbrook@csx.com)

For Metra: Mr. Marty Ryan  
Acting Chief Transportation Officer  
Metra Chicago Transit  
547 W. Jackson Boulevard, 5<sup>th</sup> Floor  
Chicago, IL 60661  
Facsimile: (312) 322-8986  
Email: [mryan@metrarr.com](mailto:mryan@metrarr.com)

For NS: Mr. Mark Owens  
NRPC Operations Officer  
Norfolk Southern Corporation  
Amtrak Operations Box 158  
1200 Peachtree Street, NE  
Atlanta, GA 30309  
Facsimile: (404) 582-5556  
Email: [mmowens@nscorp.com](mailto:mmowens@nscorp.com)

For UP: Ms. Peggy Harris  
NRPC Operations Officer  
Union Pacific Railroad Company  
850 Jones Street  
Omaha, NE 68102  
Facsimile: (402) 636-7871  
Email: [PEHARRIS@up.com](mailto:PEHARRIS@up.com)

6. Procures and maintains, at no cost to Amtrak or any Operating Railroad, during the entire period that it maintains and/or services State-owned or leased rail

equipment, the types of insurance specified below. The Contractor shall submit to Amtrak a certificate of insurance giving evidence of the required coverages prior to commencing work. All insurance shall be procured from insurers authorized to do business in the jurisdiction where operations are to be performed. The Contractor shall require all subcontractors to carry the insurance required herein, or may, at its option, provide the coverage for any or all subcontractors and, if so, the evidence of insurance submitted shall so stipulate. The insurance shall provide for thirty (30) days prior written notice to be given to Amtrak and each Operating Railroad in the event coverage is substantially changed, canceled or non-renewed. If the insurance provided is not in compliance with all the requirements herein, Amtrak maintains the right to cease operation of the Service until proper evidence is provided. Amtrak shall be provided with copies of the applicable policies of insurance, and endorsements or (if policy copies are not available) binders adopting the same prior to October 1, 2013 unless the time for provision of same is extended by the parties. In no event will Amtrak operate the Service until it has received a copy of the contract evidencing Contractor's indemnification obligations to Amtrak and the required evidence of insurance as specified in the preceding sentence. During the term of this Agreement the State shall provide or cause its Contractor to provide copies of policies of insurance (or if unavailable, binders adopting the same) required hereunder upon written request of Amtrak within ten (10) days or such other time as agreed to the parties.

Evidence of insurance shall be submitted to:

Cathy H. Rawlings  
Director, Risk Management  
National Railroad Passenger Corporation  
60 Massachusetts Avenue, N.E.  
Washington, DC 20002  
Facsimile: (202) 906-2174  
Email: [cathy.rawlings@amtrak.com](mailto:cathy.rawlings@amtrak.com)

Workers' Compensation Insurance:

A policy complying with the requirements of the statutes of the jurisdiction(s) in which the contract work will be performed, covering all employees of the

Contractor. Employer's Liability coverage with limits of liability of not less than One Million Dollars (\$1,000,000.00) each accident or illness shall be included.  
General Liability Insurance

General Liability Insurance and Excess Liability Insurance:

A policy issued to and covering liability imposed upon the Contractor with respect to all work to be performed and all obligations assumed by the Contractor under the terms of its contract with the State. Products-completed operations, independent subcontractors, and contractual liability coverages are to be included, and all railroad exclusions are to be deleted. If any machinery, equipment, storage containers or anything else that has the potential for releasing contaminants (e.g., fuels, lubricants, etc.) into the environment will be brought onto the job site, the policy shall be endorsed to provide coverage for sudden and accidental pollution. Amtrak and each Operating Railroad are to be designated as additional insureds with respect to operations to be performed in connection with the Contractor's contract with the State. Coverage under this policy, or policies, shall have limits of liability of not less than Two Hundred Million Dollars (\$200,000,000.00) per occurrence, combined single limit for bodily injury (including disease or death), personal injury and property damage (including loss of use) liability, with a Two Hundred Million Dollars (\$200,000,000.00) annual aggregate, and a deductible/retention not exceeding Twenty-Five Thousand Dollars (\$25,000.00) per occurrence to be paid by the Contractor and/or the State.

Automobile Liability Insurance:

A policy issued to and covering the liability of the Contractor arising out of the use of all owned, non-owned, hired, rented or leased vehicles which bear, or are required to bear, license plates according to the laws of the jurisdiction in which they are to be operated, and which are not covered under the Contractor's General Liability Insurance. The policy shall designate Amtrak and each Operating Railroad as additional insureds with respect to operations to be performed in connection with the Contractor's contract with the State. Coverage under this policy (or policies) shall have limits of liability of not less than Five Million Dollars (\$5,000,000.00) per occurrence, combined single limit for bodily injury and property damage liability.

Property Insurance:

A policy issued to the Contractor to protect its interest in the equipment (excluding any State-owned or leased rail equipment) to be used in performance of the Contractor's contract with the State, covering all risks of physical loss or damage to such equipment. The coverage under such policy shall have limits of liability adequate to protect the value of the equipment on a replacement cost basis. Amtrak and each Operating Railroad are to be designated as additional insureds as their interests may appear and the policy shall contain a waiver of subrogation against Amtrak and each Operating Railroad, their respective employees and agents.

Pollution Liability Insurance:

A policy issued to and covering the liability of the Contractor arising out of the pollution or impairment of the environment, including costs of investigation and clean-up, caused by the performance of activity in connection with the Contractor's contract with the State. Amtrak and each Operating Railroad shall be named as additional insureds with respect to operations to be performed by the Contractor, and the policy shall contain a waiver of subrogation against Amtrak each Operating Railroad, their respective employees and agents. Coverage under this policy (or policies) shall have limits of liability of not less than Ten Million Dollars (\$10,000,000.00) each claim. The Contractor may, at its option, cover this pollution liability exposure under its General Liability insurance required above, and if this is done, the certificate of insurance submitted must clearly indicate that these coverages are combined.

IF ANY LIABILITY INSURANCE SPECIFIED ABOVE SHALL BE PROVIDED ON A CLAIMS MADE BASIS THEN, IN ADDITION TO COVERAGE REQUIREMENTS ABOVE, SUCH POLICY SHALL PROVIDE THAT:

The policy retroactive date coincides with or precedes the Contractor's start of work (including subsequent policies purchased as renewals or replacements).

The Contractor will make every effort to maintain similar insurance for at least two years following project completion, including the requirement of adding Amtrak and each Operating Railroad as additional insureds.

If insurance is terminated for any reason, the Contractor agrees to purchase an extended reporting provision of at least two (2) years to report claims arising from work performed in connection with its contract with the State.

The policy allows for reporting of circumstances or incidents that might give rise to future claims.

**Section 16. Employment of Department Personnel.**

Amtrak shall not employ or enter into a contract with any employee of the State for purposes of fulfillment of the terms of this Agreement without the express written consent of the State.

**Section 17. Representatives of INDOT.** INDOT may choose to designate any employee, official, representative or agent, to act on behalf of the State in the performance of any duties or exercise of any rights under this Agreement. However, Amtrak shall have the right of approval of INDOT's selection of any consultant or contractor. Such concurrence shall be in writing and shall not be unreasonably withheld. The State agrees that any consultant or contractor to be hired by INDOT to perform any duties under this Agreement shall not be a competitor or potential competitor of Amtrak (i.e., a provider of passenger rail service). However, this Section 17 shall not be construed to apply to a third party contractor selected through an RFP process as provided under Section 15 of this Agreement.

**Section 18. Status of Contractor.**

Services provided by Amtrak pursuant to this Agreement shall be as an independent contractor and neither Amtrak nor any employee or agent thereof shall be considered to be an employee of the State.

**Section 19. Termination Notice.**

49 U.S.C. subsection 24706(a) requires that at least one hundred and eighty (180) days before "discontinuing service over a route, Amtrak shall give notice of the discontinuance in the way Amtrak decides will give a State, a regional or local authority, or another person the opportunity to agree to share or assume the cost of any part of the train, route or service to be discontinued." Because the availability of State funding upon expiration or termination of this Agreement is not now known, Amtrak and the State agree that this Section does, and will be deemed to, constitute adequate notice under 49 U.S.C. subsection 24706(a) so that the State (and/or others working with the State, such as regional or local authorities) has the opportunity to agree to share or assume the cost of continuing the service provided by Amtrak hereunder upon such expiration or termination. The State concurs with Amtrak's decision that no notice beyond this section need be given.

**Section 20. On-Time Performance.** In accordance with the parties' objective to provide high-quality,

on-time rail passenger services, Amtrak and the State jointly agree to undertake the following initiatives:

(a.) Amtrak and the State shall jointly work to establish annual baseline performance for the Hoosier State Service. Baseline performance shall be established for the following categories: (1) overall OTP; (2) Host Railroad responsible delay minutes; (3) Amtrak responsible delay minutes; (4) equipment related service interruptions; and (5) customer satisfaction. The parties agree to confer within sixty (60) days following execution of this Agreement to establish performance targets, including the On-time Performance target set forth in Section PRIIA 213, and thereafter, to confer not less than quarterly to review performance against baseline, and to develop/evaluate potential service and revenue improvement measures.

**Section 21. Funding Cancellation Clause.** In the event the Director of the Indiana Office of Management and Budget makes a written determination that funds are not appropriated or otherwise available to support continuation of Indiana's performance of its obligations under this Agreement, this Agreement shall be canceled. A determination by either Budget Director that funds are not appropriated or otherwise available to support continuation of performance shall be final and conclusive.

Amtrak may seek recovery from the State for any amounts unpaid for services rendered or goods delivered through the date of cancellation, along with all costs flowing from the cancellation, but only to the extent such costs are eligible for reimbursement under this Agreement. Actual costs incurred by Amtrak for labor protection costs as a result of termination of this Agreement shall be considered a cost eligible for reimbursement under this Agreement.

**Section 22. Compliance with Laws.**

(a.) The Parties shall comply with all applicable federal, state and local laws, rules, regulations and ordinances, and all provisions required thereby to be included herein are hereby incorporated by reference. If a Party violates such rules, laws, regulations and ordinances, the Party shall assume full responsibility for such violations and shall bear any and all costs attributable to the original performance of any correction of such acts. The enactment of any state or federal statute, or the promulgation of regulations thereunder, after execution of this Agreement shall be reviewed by the Parties pursuant to Section 13 above.

(b.) Amtrak represents that, to the best of its knowledge and other than as disclosed to INDOT prior to or contemporaneously with the execution and delivery of this Agreement:

(i) *Required State of Indiana Payments.* Amtrak is not presently in arrears in payment of its taxes, permit fees or other statutory, regulatory or judicially required payments to the State

of Indiana. Further, Amtrak agrees that any payments in arrears and currently due to the State of Indiana may be withheld from payments due to Amtrak. Additionally, further work or payments may be withheld, delayed, or denied and/or this Agreement suspended until Amtrak becomes current in its payments and has submitted proof of such payment to the State.

- (ii) *State of Indiana Actions.* Amtrak certifies that it has no current or outstanding criminal, civil, or enforcement actions initiated by the State of Indiana pending and agrees that it will immediately notify INDOT of any such actions. During the term of such actions, Amtrak agrees that INDOT may delay, withhold, or deny work under any supplement or amendment, change order or other contractual device issued pursuant to this Agreement.
- (iii) *Professional Licensing Standards.* Amtrak, its employees and contractors have complied with and shall continue to comply with all applicable licensing standards, certification standards, accrediting standards and any other laws, rules or regulations governing services to be provided by Amtrak pursuant to this Agreement.
- (iv) *Work Specific Standards.* Amtrak and its contractors, if any, have obtained, will obtain and/or will maintain all required permits, licenses, registrations and approvals, as well as comply with all applicable health, safety, and environmental statutes, rules, or regulations in the performance of work activities under this Agreement.
- (v) *Secretary of State Registration.* If Amtrak is an entity described in IC Title 23, it is properly registered and owes no outstanding reports with the Indiana Secretary of State. Pursuant to 49 USC 24301(b), Amtrak is authorized to do business in the State of Indiana.

(c.) *Ethics.* Amtrak and its agents shall abide by all ethical requirements that apply to persons who have a business relationship with the State of Indiana, as set forth in Indiana Code § 4-2-6, *et seq.*, Indiana Code § 4-2-7, *et seq.*, the regulations promulgated thereunder, and Executive Order 05-12, dated January 12, 2005 (collectively, "Ethical Standards"). If Amtrak is not familiar with these ethical requirements, Amtrak should refer any questions to the Indiana State Ethics Commission, or visit the Indiana State Ethics Commission website at <<<http://www.in.gov/ethics/>>>. If Amtrak or its agents violate any of the Ethical Standards, INDOT may, at its sole discretion, terminate this Agreement immediately upon notice to Amtrak. In addition, Amtrak may be subject to penalties under Indiana Code §§ 4-2-6 and 4-2-7, and under any other applicable state or federal laws.

**(d.) Telephone Solicitation.** As required by IC 5-22-3-7: (1) Amtrak and any of its principals certify that (A) Amtrak, except for de minimis and nonsystematic violations, has not violated the terms of (i) IC 24-4.7 [Telephone Solicitation Of Consumers], (ii) IC 24-5-12 [Telephone Solicitations] , or (iii) IC 24-5-14 [Regulation of Automatic Dialing Machines] in the previous three hundred sixty-five (365) days, even if IC 24-4.7 is preempted by federal law; and (B) Amtrak will not violate the terms of IC 24-4.7 for the duration of the Agreement, even if IC 24-4.7 is preempted by federal law. (2) Amtrak and any principals of Amtrak certify that an affiliate or principal of Amtrak and any agent acting on behalf of Amtrak or on behalf of an affiliate or principal of Amtrak: (A) except for de minimis and nonsystematic violations, has not violated the terms of IC 24-4.7 in the previous three hundred sixty-five (365) days, even if IC 24-4.7 is preempted by federal law; and (B) will not violate the terms of IC 24-4.7 for the duration of the Agreement, even if IC 24-4.7 is preempted by federal law.

**Section 23. Title VI Assurances; Non-Discrimination.**

**(a.)** Pursuant to the Indiana Civil Rights Law, specifically including IC 22-9-1-10, and in keeping with the purposes of the Civil Rights Act of 1964, the Age Discrimination in Employment Act, and the Americans with Disabilities Act, the Parties, with regard to any work performed pursuant to this Agreement, shall not discriminate on the grounds of race, color, sex, or national origin in the selection and retention of contractors, including procurements of materials and leases of equipment. In all solicitations either by competitive bidding or negotiation made by the Parties for work to be performed under a Agreement, including procurements of materials or leases of equipment, each potential contractor or supplier shall be notified by the Party of its obligations relative to nondiscrimination in Federally-assisted programs pursuant to 49 CFR 21, which are herein incorporated by reference and made a part of this Agreement.

**(b.)** The Parties shall not modify work done pursuant to this Agreement in such a manner as to require, on the basis of race, color or national origin, the relocation of any persons. (INDOT's Title VI enforcement will include the following additional grounds: sex, ancestry, age, religion and disability).

**(c.)** The Parties shall not modify work done pursuant to this Agreement in such a manner as to deny reasonable access to and use thereof to any persons on the basis of race, color or national origin. (INDOT's Title VI enforcement will include the following additional grounds: sex, ancestry, age, religion and disability.)

**(d.)** The Parties each agree to comply with such federal laws, regulations, and executive orders prohibiting discrimination as are applicable to each party in the performance of their duties and

obligations hereunder. Nothing in this covenant shall be construed to imply or establish an employment relationship between the Parties.

**Section 24. Severability.** The invalidity of any section, subsection, clause or provision of this Agreement shall not affect the validity of the remaining sections, subsections, clauses or provisions of this contract.

**Section 25. Non-Collusion.** The undersigned attests, subject to the penalties for perjury that the undersigned is the properly authorized representative of Amtrak. Further, to the best of the undersigned's knowledge, neither the undersigned nor any other employee, representative, agent or officer of the Party has entered into or been offered any sum of money or other consideration, either directly or indirectly, for the execution of this Agreement other than that which appears upon the face hereof.

**THE REMAINDER OF THIS PAGE IS LEFT BLANK INTENTIONALLY.**

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their duly authorized representatives in multiple original counterparts as of the day and year first above written.

NATIONAL RAILROAD PASSENGER CORPORATION

  
Joseph Boardman  
President and Chief Executive Officer

Date 10/14/13

Approved As To Form

  
Robin A. McCarthy  
Senior Associate General Counsel  
Amtrak Law Department

STATE OF INDIANA

Indiana Department of Transportation

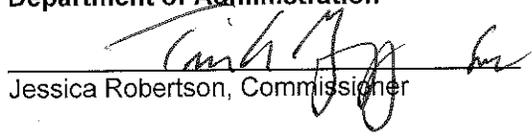
By:

  
Karl B. Browning, Commissioner

Date: 10.21.13

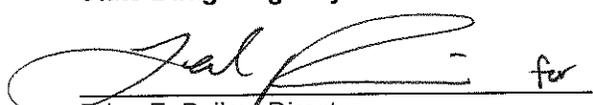
STATE OF INDIANA  
APPROVALS

Department of Administration

  
Jessica Robertson, Commissioner

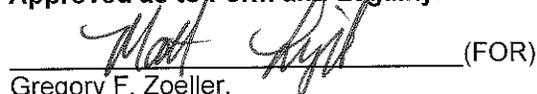
Date: 10/25/13

State Budget Agency

 for  
Brian E. Bailey, Director

Date: 10/28/2013

Approved as to Form and Legality:

 (FOR)  
Gregory F. Zoeller,  
Attorney General of Indiana

Date: 10/29/13



# **E**

## **Sample Project Management Plan**





## **Sample Project Management Plan**

## **Vermont Agency of Transportation**

**May 2013**

## **PROJECT ORGANIZATION AND MANAGEMENT**

The Vermont Agency of Transportation (VTrans) owns and manages approximately 453 miles of railroad right-of-way – some 60% of all railroad right-of-way in Vermont. Of this, 305 miles is active rail that is leased to private operators. To remain viable and support for Vermont’s economy, most of the rail lines require substantial work to remain in a state of good repair.

In the past decade, VTrans has invested close to \$100 million on state-owned rail lines to keep them operable. System preservation is at the core of VTrans’ strategy to maintain rail freight as a cost-effective shipping option for the state’s industries.

This plan describes the roles and responsibilities of parties involved in VTrans rail projects, potential project risks and mitigation strategies, and project processes.

## **PROJECT MANAGEMENT APPROACH**

The project management approach encompasses a number of experienced VTrans transportation staff and relies on contractors to support VTrans. VTrans’ project management staff performs the functions necessary to maintain, monitor and verify the project schedule and budget. The management approach will include the following:

- Organization, mobilization and direction of the work.
- Execution of design, procurement and construction.
- Project controls, including cost and quality control.
- Coordination and management of the work of consultants and contractors.
- Administration and project procedures.
- Quality assurance.
- Safety and Security.
- Project Management.
- Administrative and technical support.

VTrans’ Rail Section is located within the Policy, Planning and Intermodal Development (PPID) Division, and is responsible for the full range of planning, program management, project management, and technical oversight activities for rail capital projects. The Rail Section currently manages dozens of individual projects. Most recently, rail investments have focused on projects throughout the State to improve railroad state of good repair, network capacity and efficiency, and to improve vertical clearances.

In the past five years, substantial federal investments were made to Vermont’s rail system. These include:

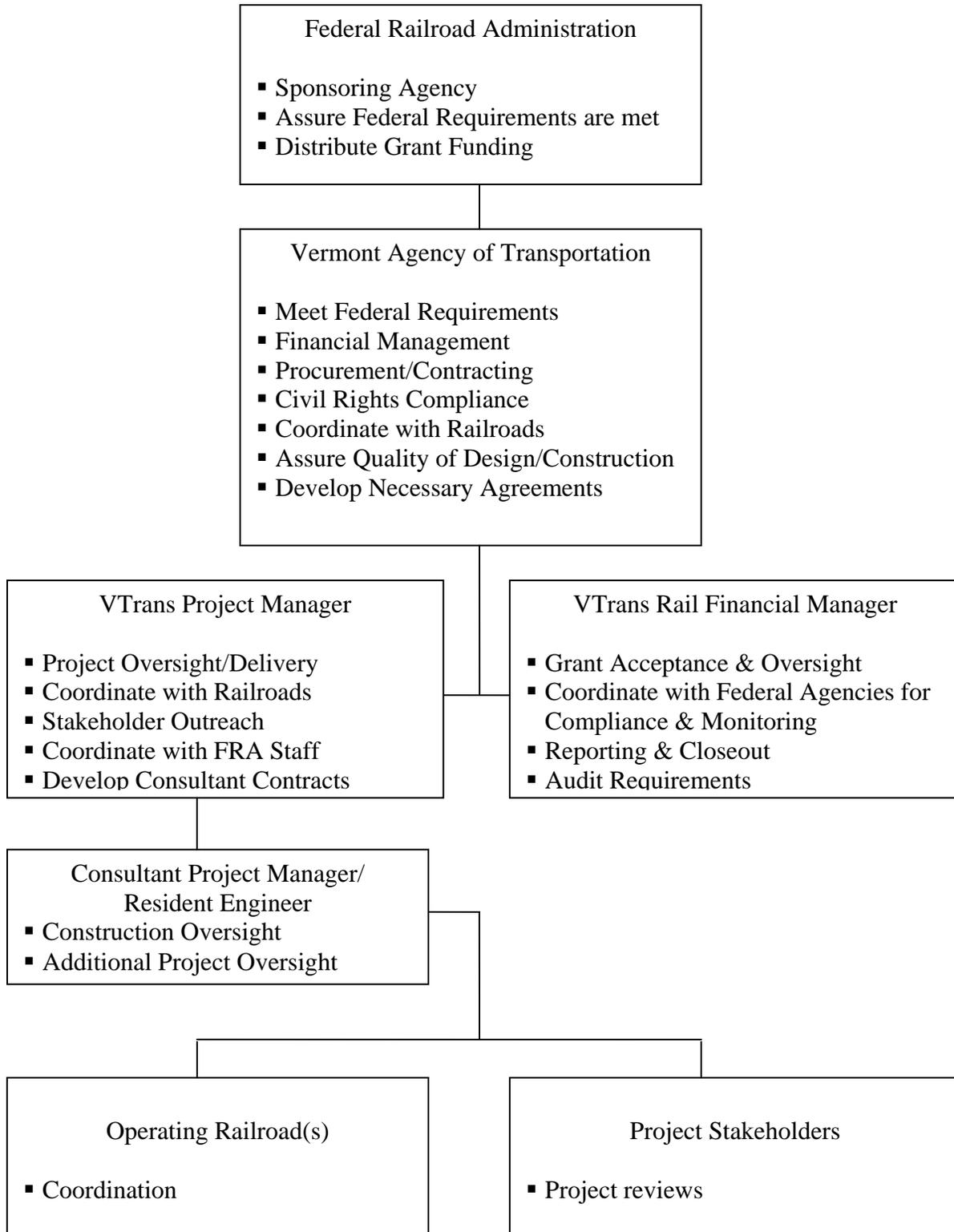
- FRA High-Speed and Intercity Passenger Rail (HSIPR) Grant – FRA Track 1 - \$52.7 million for rehabilitation work along the Vermonter Amtrak service, which improved the condition of track, roadbed, grade crossings, and bridges for New England Central Railroad. The project resulted in intercity passenger trains to increase track speeds from 59 to 79 mph for 25 miles on the Palmer subdivision between milepost (MP) 144.98 and MP 170.00 and from 40 to 59 mph over the remaining 168 miles (between MP 110.5 on the Palmer subdivision and MP

132.00 on the Roxbury subdivision). The installation of the new continuously welded rail (CWR) and new turnouts as well as the elimination of temporary and permanent slow orders will reduce the Vermonter's operating schedule by 27 minutes in Vermont and New Hampshire.

- FHWA Rail Highway Crossing Hazard Elimination in High Speed Rail Corridors - \$2.2 million to rehabilitate 15 crossings on the New England Central Railroad, allowing higher operating speeds for freight and passenger rail.
- U.S. DOT TIGER IV Grant- \$7.9 million to upgrade 18.8 miles of railroad track between St. Albans, Vermont, and the Canadian border. The upgrades will enable the track to carry the gross rail weight standard of up to the 286,000 pounds, allowing more efficient movement of goods throughout the region and internationally.
- SAFETEA-LU Western Corridor Rehabilitation - \$25 million for line improvements along Vermont's western corridor. Funds used to replace track and rehabilitate crossings and bridges.

Rail grants are assigned a VTrans rail project manager, and follow a workflow with several controls and review steps (see Figure 1). Consultant managers are used to assist with various technical tasks. VTrans will utilize third party bid solicitations for project construction. Construction reimbursement activities will be authorized by VTrans' project manager when all reviews have been completed and the contractor has met with VTrans and the rail operator. VTrans' staff and consultant manager will inspect construction activities to ensure conformance with the plans, specifications and terms of agreements.

**FIGURE 1: PROJECT MANAGEMENT FLOW CHART**



VTrans has experienced staff in several different divisions and units that will facilitate the project outcome. The Finance & Administration (F&A) Division houses the Agency's Budget Operations, Financial Operations, Audit Section, Contract Administration Section, and Civil Rights & Labor Compliance Section. A general overview of each unit and the number of employees within it is below:

- Budget Operations (six employees) – Oversees the budgeting process and ensures all projects have been approved by the Vermont State Legislature.
- Financial Operations (thirty-five employees) – Works with VTrans' project managers and business office managers to ensure projects are set up in VTrans' financial systems, internal controls are met, and funds are drawn down properly.
- Audit Section (five employees) - The Audit Section provides audit assistance to agency management under the supervision of the Director of Finance and Administration. This unit provides audit assurance regarding the Agency's administration of public funds with third parties by evaluating and auditing contracts, grant agreements, utility agreements, railroad agreements and leases.
- Contract Administration Section (thirteen employees) – The primary responsibilities of Contract Administration involve the performance of the Agency's procurement and contracting functions related to construction contracts and personal service contracts; the processing of grants, cooperative and maintenance rental agreements; and the pre-qualification of construction contractors and consultants.
- Civil Rights & Labor Compliance Section (six employees) – This office is responsible for ensuring compliance with all federal and state EEO/AA and labor requirements within the Agency and on all U.S DOT funded projects.

The Rail Section consists of 15 employees, including the Rail Program Director. This section includes two areas of focus – Project Development (eight engineers and technicians) and Property Management (six employees). The Rail Projects Section, with the support of trained field inspectors through the Program Development Division (see below for a more detailed description) provides on-site visits, project monitoring, consultant oversight, and work with the operating railroad(s) to coordinate project implementation.

The following sections of the Program Development Division support project implementation: Construction Management Section where consultants and field inspectors are supervised (fourteen employees), Materials & Research Section for quality and conformance of materials used (fifteen employees located in the Materials Section only), and Permitting Sections (Right of Way, Utilities & Permits, Survey Sections and Environmental Services & Hydraulics Sections). The Permitting Sections consist of sixty employees.

### **PROJECT CONTROL POINTS**

VTrans has several controls in place to ensure project delivery. The Agency has been successfully advertising and awarding construction projects for over 80 years and has had

a prime contractor prequalification process in place since 1951. Over the years many safeguards have been put into effect to protect the public investment in Vermont's transportation infrastructure improvement projects. Outlined below are the key steps that are used as project control points.

### Monitoring

- Once a signed contract is in place with the construction contractor, the project is overseen by the Rail Section's Project Manager, supported by the Agency's Construction Division or a Consultant Resident Engineer. Any changes to the project as bid must be approved by the resident engineer and rail project manager.
- Depending on the scale and complexity of the project, additional staff may be assigned to assist the project manager and resident engineer in the day-to-day oversight of the work. The inspectors in the field monitor the contractors' work to ensure it is in conformance with the plans and specifications.
- Field inspectors are trained to ensure safe traffic control practices, enforcement of environmental regulations, and safe work practices.
- Contractors are only paid for work that meets specification and is complete and in place as determined by the Agency's resident engineer, project manager and construction staff. Bi-weekly estimates are prepared by Agency staff and are processed through a comprehensive payment processing protocol that has been developed to manage payments.
- The Agency has a separate Materials and Research Section, which inspects, samples and tests materials used on the job to ensure quality and conformance with the specifications. Many materials provided contractors also require submittal of signed and documented material certificates. These ensure that only quality materials are used on the project. In the case where "Buy America" provisions apply, this is also documented through the material certification process.
- When a project is completed the Construction Division conducts a "final inspection" during which any unacceptable or uncompleted work is noted and a punch list provided to the contractor to take appropriate action. The contractor does not receive final payment until all work has been completed to the satisfaction of the Agency.
- After a project is completed in the field it goes through a "finals" process. This is a comprehensive check of the quantities, payments and material certifications to ensure all work was properly completed.
- The Agency undergoes annual external audits of all the programs that use federal funds. These audits are designed to find discrepancies, identify areas of potential weakness, and are used to continually upgrade and improve the performance of our various monitoring and compliance systems.

**FINANCIAL CONTROL POINTS****Invoice Verification**

- The expenditure account (EA) and subjob are assigned. These contain most of the chartfields required for payment.
- The invoice and backup documentation is verified against the contract and/or grant document.
  - Scope of work
  - Materials
  - Payment provisions
- The invoice is verified for compliance with various federal regulations, state statutes, administrative bulletins, and agency procedures.
- Adequate funds in the budget are confirmed.

**Invoice Approval**

- All invoices presented for payment are approved by the following VTrans staff:
  - Project manager
  - Program manager
  - Contract manager
  - Grants management section
 } For contractual obligations  
 } For financial obligations
- The approval is signified by the signature of the approver and the date approved.

**Invoice Payment**

- Other chartfields are assigned as needed.
  - Object detail or expense account
  - Vendor number
- The invoice is entered in the STARS accounting system used by VTrans.
- STARS is interfaced into VISION daily.
  - VISION is the statewide accounting system that generates checks.
- The interface records are reviewed daily by Financial Operations - Accounts Payable.
  - Errors are researched thoroughly and corrected in concert with the appropriate business office staff.
- The checks or electronic payments are processed by VISION.
  - VISION generates a warrant of all vouchers to be paid that day.
  - This warrant must be approved by the Commissioner of Finance & Management or his/her designee.

**Monitoring & Audits**

- All expenditures are reviewed monthly to assure proper coding and purpose.
- Corrections are processed by Financial Operations – Accounting.
- There is a Single Audit performed most years for the federal funds by independent auditors contracted by the State Auditor’s Office
- The Transportation fund is audited annually by the State Auditor’s Office.

## **RISK MANAGEMENT**

VTrans' average annual budget is approximately \$500 million. The Agency has sufficient flexibility to shift funding between projects to accommodate unforeseen cost overruns, and can also shift funding between programs if necessary. Adding to this capability is active budget monitoring process whereby finance and budget staff meet regularly with program management staff (monthly at minimum) to monitor expected costs at both a project and overall program level of detail. This careful monitoring allows us to identify in advance when and where potential budgetary adjustments may become necessary, and plan for the changes in advance to avoid sudden and more disruptive funding shifts.

Vermont also recently enacted legislation that adds infrastructure assessments to sales of motor fuels – diesel and gasoline – that are dedicated exclusively to long-term transportation infrastructure investments. These assessments have the additional advantage of serving as a dedicated revenue source to pay debt service on revenue bonds for transportation investments if necessary. The potential for issuing bonds provides additional capacity, if needed, to accommodate unforeseen project and program cost overruns.

The primary non-federal sources for Vermont's transportation budget include transportation motor fuel infrastructure funds (mentioned above) and the transportation fund. Although transportation source revenues have experienced some decline recently, the state typically seeks regular increases in motor vehicle fees – a major component of the fund – on a three year cycle. Thus revenues are regularly increased to accommodate for inflation. Moreover, to protect against annual revenues fluctuations, the state maintains a transportation fund stabilization reserve equal to five percent of the prior fiscal year level of transportation fund appropriations.

*Grantee risk:* State governments in general are tasked in these difficult economic times to do more with less. Vermont, and VTrans, is no exception. As such, there is a risk that VTrans will be unable to find adequate human resources to implement projects. The Agency mitigates this risk by actively evaluating business processes that can be streamlined, coordinated, or consolidated to minimize the impact of a reduced workforce. In addition, VTrans has multi-year consultant retainer contracts that can assist in managing workflow.

*Funding risk:* Vermont, like other states, faces the challenge of revenues not keeping pace with the demand to improve transportation infrastructure. This challenge poses a risk that sufficient funding will not be available to address growing needs. Vermont has taken several steps to mitigate this risk. Most recently, as indicated above, the new motor fuel assessments were adopted that provide dedicated additional revenues for transportation infrastructure, and also serve as a dedicated source for issuing revenue bonds if needed to assist in meeting transportation needs. VTrans takes a system-wide view of transportation problems, needs, and opportunities. The rationale is to ensure the

maximum benefit per dollar of investment, while at the same time achieving system-wide performance goals. That system-wide viewpoint is reflected in the annual budget-development process, which includes asset management, performance measures, and project prioritization as a means to maximize limited transportation dollars.

VTrans has been developing system-wide performance measures since 2001, and have become a crucial part of managing the assets and services entrusted to the Agency. Performance measures indicate the Agency's effectiveness in accomplishing its mission and highlight where shifts in funding are needed.

*Schedule risk:* There are several sources of schedule risk. Program timelines pose a risk that VTrans may not be able to deliver projects quickly enough to satisfy obligation and construction schedules. Permitting and other technical requirements add to schedule risk, as does the availability of contractors to bid on and complete work. VTrans can mitigate this risk by making grant projects a top priority and dedicating resources from various parts of the Agency to assist in meeting schedule concerns. An example of this is the Department of Motor Vehicles, which successfully utilized "tiger teams" to employ in areas where workloads backed up to assist in alleviating the problem quickly.

### **CIVIL RIGHTS AND LABOR COMPLIANCE CONTROL POINTS**

VTrans has an office dedicated to enforcing all state and federal civil rights requirements. The VTrans Office of Civil Rights and Labor Compliance Section is responsible for administering all mandatory internal and external civil rights programs, including External EEO/Contractor Compliance, Disadvantaged Business Enterprise (DBE), On-the-Job Training (OJT), Davis-Bacon/Labor Compliance, Title VI, Internal EEO/AA, and ADA/Section 504. The following responsibilities are applicable to all programs:

- Development and implementation of annual program plans and updates.
- Monitoring and data collection, analysis, and reporting (monthly, quarterly, semi-annually, or annually, as required).
- Training and technical assistance.
- Investigations, audits, site visits, and/or project/contract compliance reviews.
- Enforcement.

Other requisite program responsibilities include outreach, public notice and facilitation of public participation and access, networking, assessment and evaluation.

**Notice:** All federal and state civil rights and labor compliance requirements are the subject of VTrans policies and contract specifications that are incorporated in all bidding and contract documents. Contractors are also placed on notice of their compliance responsibilities through the following vehicles:

- Comprehensive pre-construction letter and participation of VTrans Civil Rights staff at the pre-construction conference.

- Dissemination of Contractor Compliance manuals, checklists, and reference guides on the VTrans Civil Rights webpage, at periodic training, and during site visits and compliance reviews.

**Data Collection and Reporting:** The following documents and data are collected and reviewed to ensure compliance with all applicable regulations, statutes, and Executive Orders:

- Weekly certified payrolls
- Monthly payments from primes to subs
- Monthly utilization reports
- Semi-annual DBE participation data
- Semi-annual labor compliance data
- Annual DBE certification eligibility
- Annual bidders list survey
- Annual EEO survey

**Monitoring and Enforcement:** VTrans Civil Rights staff employ the following methods for monitoring and enforcing contractor and labor compliance on federally funded projects:

- Site visits and inspections
- Investigations
- Compliance reviews

**Sanctions for Non-Compliance:** VTrans contractors found in violation of civil rights and labor compliance requirements face progressive penalties and sanctions, including the following:

- Reduction, suspension, or revocation of pre-qualification status
- Withholding of periodic payments
- Debarment