VERGENNES PLANNING AND ENVIRONMENT LINKAGES (PEL) STUDY

Attachment 3: Conceptual Design Technical Memorandum

October 2024

VERMONT
AGENCY OF TRANSPORTATION

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1. Introduction

The Vermont Agency of Transportation (VTrans), in cooperation with the Addison County Regional Planning Commission (ACRPC) and Federal Highway Administration (FHWA), is preparing a Planning and Environment Linkages Study (Vergennes PEL Study) to evaluate transportation alternatives to reduce the impacts of large trucks on VT Route 22A (Route 22A) in downtown Vergennes while also enhancing the quality of life and economic vitality for residents in the city and surrounding towns. The Vergennes PEL Study will build upon previous planning efforts completed over the last 25 years that considered alternatives at different levels of detail. Improvements to the transportation system that could be constructed as a result of the Vergennes PEL Study and are federally funded would require FHWA approval under the National Environmental Policy Act (NEPA).

Additional information and current and future reports can be found on the Vergennes PEL Study website (www.vergennespel.com).

Two of the primary outcomes of the Vergennes PEL Study are a purpose and need statement that receives federal and state resource agency concurrence and a list of reasonable transportation alternatives (concepts[1]) that may move forward for evaluation in a future NEPA environmental review. NEPA compliance is required whenever a federal agency proposes an action, grants a permit, or agrees to fund or authorize any other entity to undertake an action that could affect environmental resources. Another important outcome of the PEL Study is the coordination of reasonable transportation concepts with local land use planning. The Vergennes PEL Study will also include an implementation plan, which will include next steps for the future NEPA environmental review, local land use planning recommendations, and an identification of project financing strategies.

As described in the following sections, five possible routes have been advanced to a conceptual level of detail. These conceptual designs meet highway design standards and were developed to assist the study team in estimating the approximate limit of disturbance and property impacts associated with the construction of each of these routes.

The screening process included engaging local agencies, regional stakeholders, federal and state agencies, and the general public. A variety of methods were used including meetings, attending local events, and an online survey. The public, committees, and agency partners provided feedback on the conceptual route options. Those efforts are summarized in Agency Coordination and Public Involvement.

[1] The term “concept” is used to describe the more conceptual level of the proposed improvement, versus “alternative,” which was used during the spring outreach.

1.1 PURPOSE AND NEED STATEMENT

With public and agency input, the study team developed the Vergennes PEL Study Purpose and Need Technical Memorandum,[2] which identified the purpose and need for the project along with the goals of the study. A purpose and need statement is an important component of PEL studies and environmental reviews prepared by VTrans, as it sets the stage for the specific problems to be addressed. The *purpose* defines the transportation problem to be solved. The *need* provides evidence that supports the assertion made in the *purpose*. The purpose and need statement developed for this PEL study builds upon the purpose and need from the 2019 VT 22A Alternative Truck Route Study and reflects extensive public outreach and data collection efforts.

The *purpose* is to reduce the impacts of through truck traffic, including safety, congestion, noise, vibration, and dust on Route 22A in downtown Vergennes. Transportation solutions that reduce truck-related quality of life impacts should also meet the mobility, safety, and economic vitality needs of Vergennes and neighboring communities. A summary of the *needs* identified are detailed below.

	**Mobility and Access:** Maintain opportunities for the movement of freight in the region and minimize and/or mitigate traffic impacts to other transportation corridors.
	**Safety, Circulation, and Resilience:** Support the continued movement, resilience, and safety of travel through downtown Vergennes and in neighboring communities.
	**Quality of Life:** Improve the quality of life and minimize negative property and environmental resource impacts in downtown Vergennes and neighboring communities.
	**Economic Vitality:** Promote the economic vitality of downtown Vergennes and the movement of goods in Vergennes and neighboring communities and support the rural economy.
	**Land Use:** Support local and regional land use plans and policies and state land use goals.

[2] https://vergennespel.com/media/iiodtusc/vergennes-pel-study_purpose-and-need-final-march-2022.pdf

1.2 CONCEPT SCREENING

The purpose and need statement was used to identify an initial long list of concepts, including potential concepts from previous studies, concepts suggested by the public during prior outreach, and public/agency suggestions on concepts for the current study. The initial concepts were screened by criteria developed through an open and transparent public process to a short list of concepts that will be further developed in future phases of the PEL study. The alternatives development and screening process during this PEL study helped identify recommended and feasible options, which can move forward to conceptual design ahead of initiating a NEPA review.

The screening of concepts included the following steps:

1. Development of a long list of concepts
2. Development of screening criteria based on the study purpose and need
3. Initial screening of concepts based on screening criteria
4. Secondary screening of concepts based on geographic information systems (GIS) data
5. Elimination of concepts not advanced for further study

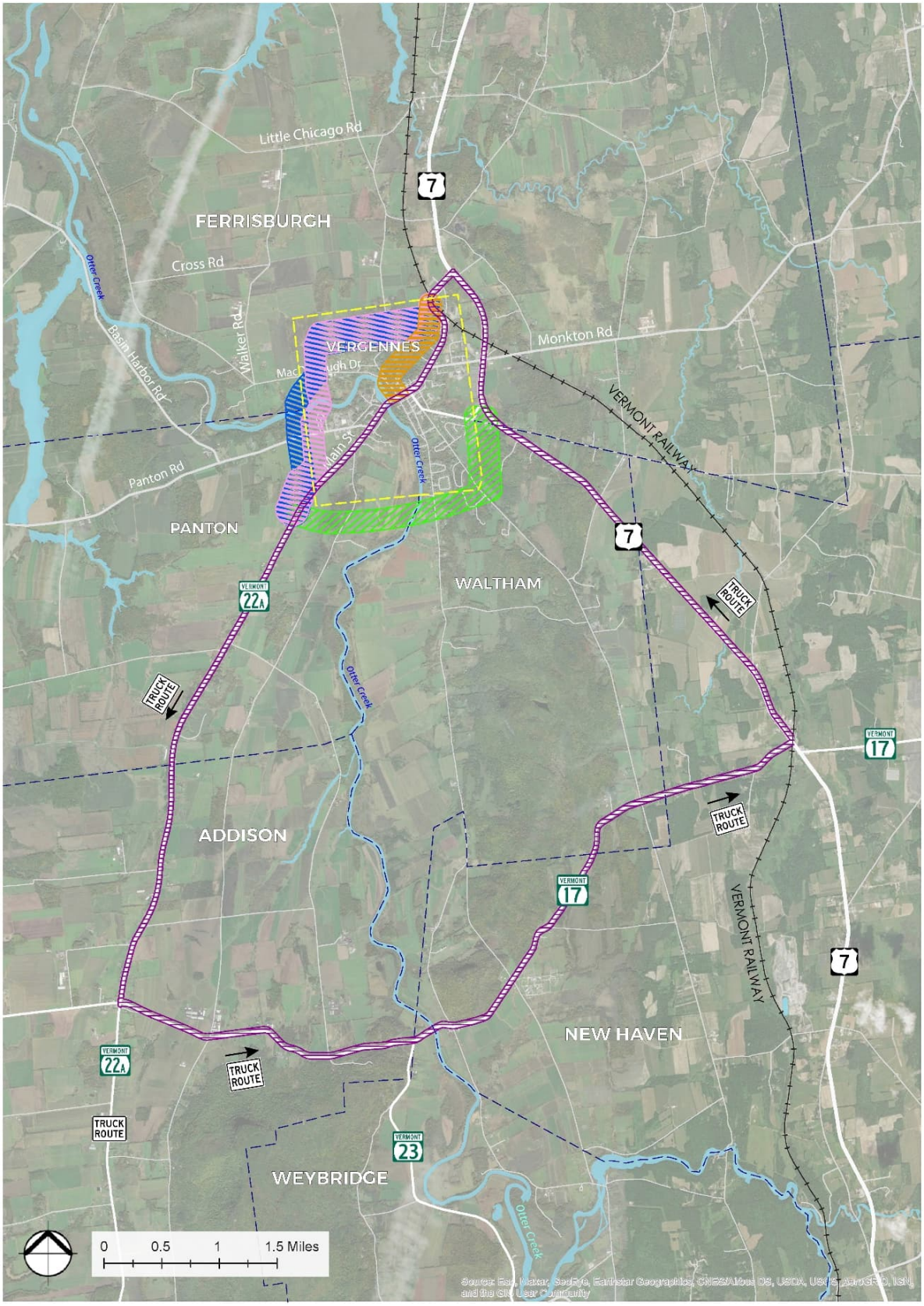
Thirteen concepts were considered within a long list, including concepts that use existing roads (including Route 22A), concepts that include the construction of new roadways, and those that focus on improvements to other freight modes. In addition, a No Build option was carried forward as a baseline for comparison to the concepts evaluated during the PEL Study.

Based on the initial screening, seven concepts were dismissed for not meeting the purpose and need. A secondary screening was conducted for the concepts that met the purpose and need during the initial screening. The secondary screening consisted of GIS desktop level analysis, and its results are presented below. Figure 1-1 presents the routes recommended for further study, along with the No Build option. These route were categorized by color for as noted below.

- The Vergennes New Roadway West Routing Option 3 (Pink Route) and Vergennes New Roadway West Routing Option 4 (Blue Route) scored high during the initial screening and no fatal flaws (i.e. features that would prohibit it from being built).were identified during the secondary screening.
- The Route 17 Northbound/Route 22A Southbound concept (Purple Route) meets the purpose and need, scored high during the initial screening, and no fatal flaws were identified during the secondary screening.
- The Panton-Vergennes-Waltham New Roadway (Southeast Routing) concept (Green Route) meets the purpose and need but scored lower than the Pink, Blue, and Purple Routes during the initial screening. During the secondary screening, potential environmental impacts (particularly to wetlands) were identified. Additionally, the potential impact to other resources, such as residential properties along existing roadways (Blue and Pink Routes near Panton Road, Orange Route along MacDonough Drive, and Purple Route along Route 17), was identified. However, a new Otter Creek crossing upstream of the Vergennes Falls may be less challenging than the proposed crossings downstream (Red, Blue, and Pink Routes) due to reduced waterway clearance requirements.

- The Vergennes Main Street New Parallel Route concept (Orange Route) meets the purpose and need and scored high during the initial screening. The secondary screening identified substantial earthwork and extensive property impacts in the vicinity of the MacDonough Drive/Comfort Hill intersection. However, these impacts are not considered a fatal flaw.

Figure 1-1 Routes Recommended for Further Study



2. Conceptual Design Methodology

The purpose of the conceptual design is to define the concepts screened through the initial and secondary screening to a greater level of detail so that the concepts can be further evaluated during the PEL Study. The conceptual layout of each route concept is, at the most basic level, controlled by design parameters such as type of facility, speed, volume of traffic, and type of terrain. Table 2-1 lists the criteria for this study, which are in accordance with Vermont State Design Standards. These standards have been incorporated into a design template that allows for an evaluation of impacts to environmental and natural resources as well as potential property easement and acquisitions specific to a particular horizonal and vertical alignment. The intent is to develop reasonable route alternatives while minimizing negative impacts. Key design criteria controlling the route alignments and limits of disturbance include the following:

- Design Speed
- Horizontal and Vertical Curvature
- Maximum Profile Grade
- Bridge Clearance
- Roadway Width

For the purposes of the conceptual design, all of the routes are classified as Rural Minor Arterials. Based on Vermont State Design Standards, Rural Minor Arterials are normally designed for speeds of 35 to 55 mph depending on terrain, driver expectancy, and other characteristics. For the Vergennes PEL Study, a design speed of 50 mph was selected for the Blue, Pink, and Green Routes on the basis that a significant portion of the new roadway passes through currently undeveloped land. Design speeds of 35 and 45 mph were selected for the Orange Route given its proximity to the downtown area and residential neighborhoods. Design speeds are typically 5 to 10 mph above the posted speed limit and will be refined as the study progresses and a vision for the surrounding land uses is developed.

Another key aspect of each route concept is the location and type of intersections most suitable for the facility. It is anticipated that all intersections would be at-grade, but a traffic analysis—to be completed at a later point during the PEL Study—will be the basis for the type and layout of each intersection. For concepts that connect directly with Route 22A, a specific design objective of the intersections of Route 22A and the new roadway is to encourage passenger vehicles to continue along Route 22A through downtown Vergennes, to the extent possible.

Environmental considerations were also considered. During the secondary screening of the initial long list of alternatives, a desktop geographic information system (GIS) analysis was conducted. GIS data were organized by three themes: 1) human considerations, 2) water resources and threatened and endangered species, and 3) protected lands and agricultural soils. The results of this analysis were also considered as the conceptual designs were developed. For example, the conceptual design assumes bridges will fully span Otter Creek to avoid stream impacts and rare, threatened, and endangered species in the creek and the new roadways were kept close to the existing ground to minimize impacts to agricultural lands and

habitat areas. Similarly, impacts to wetlands and existing buildings were avoided to the extent practicable.

Table 2-1 Design Standards

HORIZONTAL GEOMETRY		
Design Standard	Value	
Rural Minor Arterial	Blue, Pink, Green, and Purple Routes	Orange Route
Design Speed (mph)	50	35 / 45
Superelevation eMax	8.0%	8.0%
Min. Centerline Radius (ft)	758	314 (35 mph) / 587 (45 mph)
Min. Length for Horizontal Curves (ft)	750	314 (35 mph) / 675 (45 mph)
Max. Compound Curvature Ratio	1.5:1	1.5:1
Min. Lane Width (ft)	11	11
Min. Shoulder Widths (ft)		
Left	4	4
Right	4	4
Min. Clear Zone - Fill Slope 1:4 or Flatter (ft)	16	12
Min. Clear Zone - Cut Slope 1:3/1:4 or Flatter (ft)	12	10
Roadway Cross-Slope	2%	2%
VERTICAL GEOMETRY		
Rural Minor Arterial		
Max. Grade	5%	7% (35 mph) / 6% (45 mph)
K Value – Vertical Curve – Crest	84	29 (35 mph) / 61 (45 mph)
K Value – Vertical Curve – Sag	96	49 (35 mph) / 79 (45 mph)
Min. Vertical Clearance (Otter Creek) (ft)	50 (Downstream) 10 (Upstream)	Not applicable
Stopping Sight Distance (ft) (Level) (Downgrade - 6%) (Upgrade – 6%))	 425 475 388	 250 (35 mph) / 360 (45 mph) 271 (35 mph) / 400 (45 mph) 229 (35 mph) / 331 (45 mph)

Source: Vermont State Design Standards, October 1997

3. Route Options

This section identifies the routes that are being considered, including terminus locations, roadway width, bridge length, assumed minimum required bridge clearance over Otter Creek, and intersections. The concept plans, profiles, and a typical section are included in Appendix A.

3.1 NO BUILD

The No Build option would advance currently planned improvements included in the VTrans Transportation Capital Budget and routine maintenance would continue, but no significant future road realignments would be planned. While the No Build does not meet the Purpose and Need, it is carried forward as a baseline for comparison to the concepts evaluated during the PEL Study.

3.2 BLUE ROUTE

The Blue Route (Figure 3-1) is a new roadway primarily within Vergennes south and west of downtown, connecting to Route 22A near the Vergennes-Panton municipal boundary (southern terminus), and reconnecting with Vermont Route 22A south of Route 7 and the Vergennes-Ferrisburgh municipal boundary (northern terminus). A variation to the Blue Route is the Pink Route, described in section 3.3. Both routes include a new crossing of Otter Creek downstream of the Vergennes Falls and would cross the following roadways: Panton Road, MacDonough Drive, and Botsford Road/Comfort Hill. The overall length of the Blue Route is approximately 2.5 miles.

3.2.1 Horizontal Alignment

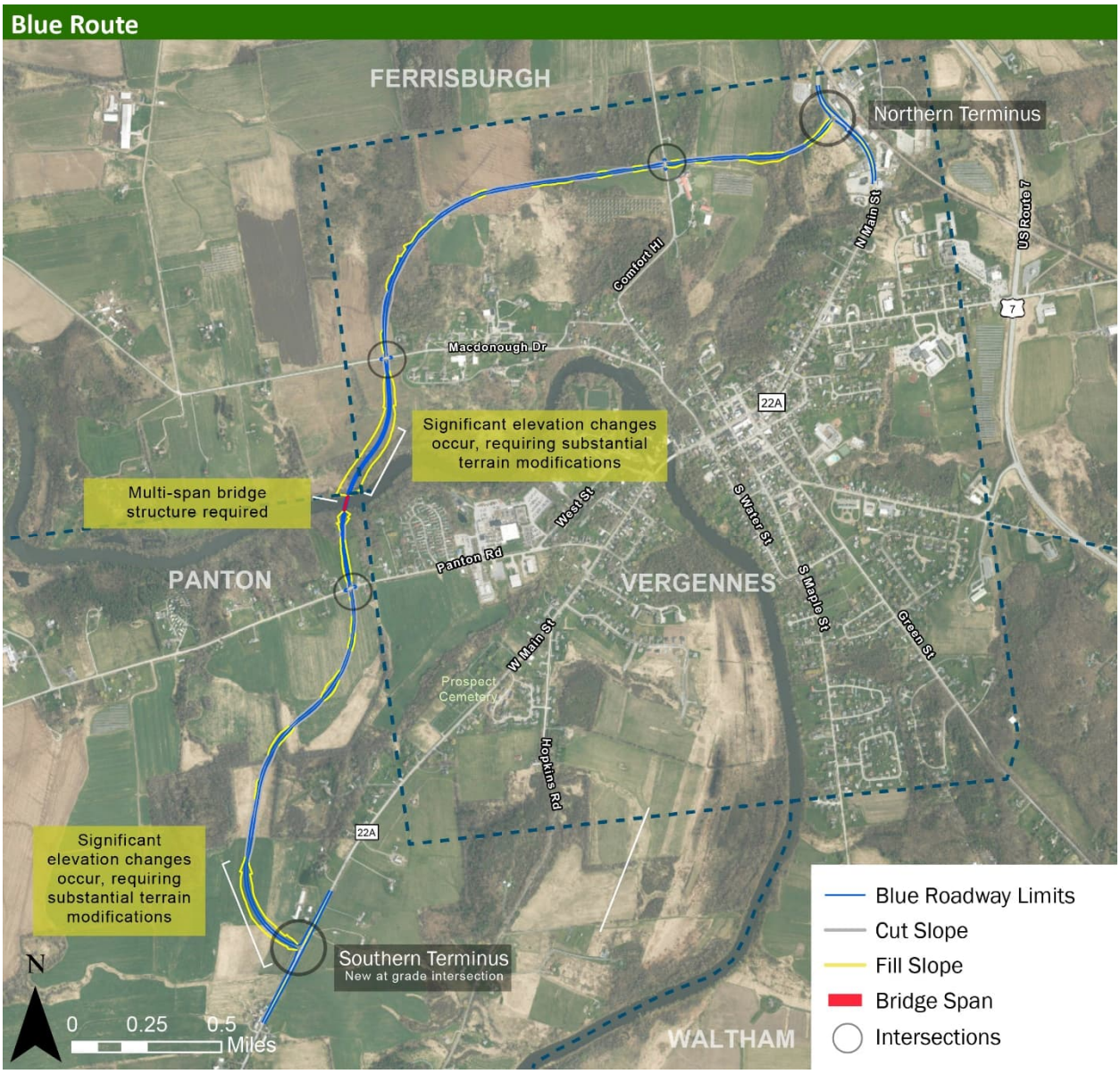
The Blue Route southern terminus intersects with Route 22A approximately 1.25 miles south of the Panton Road and Route 22A intersection. The route proceeds in a north-south direction crossing Panton Road and MacDonough Drive. It is within this segment where the Blue and Pink Routes differ with the Blue Route, being further west, closer to Panton. The other key difference between the Blue and Pink Routes is the bridge crossing over Otter Creek—a multi-span structure is likely feasible with the Blue Route. North of MacDonough Drive, the alignment of each route is identical, eventually proceeding in an east-west direction and crossing Comfort Hill. The northern terminus of the Blue Route intersects with Route 22A approximately 0.5 mile west of the Route 22A/Route 7 intersection north of downtown Vergennes.

3.2.2 Vertical Alignment

The profile for the Blue Route was established to closely match existing terrain to the most practical extent possible. There are two notable areas where significant (greater than 20 feet)elevation changes occur, requiring substantial terrain modifications. These are at the approach to the Route 22A intersection at the southerly limits and at the proposed Otter Creek bridge crossing. At the intersection, holding a maximum approach grade of 5% results in fill depths of up to 25’ from Station 94+00 to Sta 101+00. At the proposed bridge crossing Otter Creek the profile is based on achieving a 50 -foot minimum vertical clearance over the navigable portion of Otter Creek and this requirement results in fill depths of up to 50’

along approximately 1,300 feet of roadway, from Station 156+00 to Station 169+00 on the north side of the river. On the south side of the river, the upland terrain results in minimal elevation changes.

Figure 3-1 Blue Route Conceptual Engineering Details



3.2.3 Intersections

The Blue Route would include the construction of at-grade intersections with Route 22A. For the purpose of this exercise the intersections were assumed to be stop controlled or signalized. Future traffic analysis with anticipated truck volumes will allow the project team to pick the appropriate traffic control. To facilitate turning movements, widening of Route 22A is anticipated to provide designated turn lanes. Intersections with Panton Road, MacDonough Drive, and Comfort Hill would likely also be at-grade. At-grade intersections at these locations would provide additional opportunities for local and regional traffic on Panton Road, MacDonough Drive, Comfort Hill, and additional access to and from Route 22A.

3.2.4 Bicycle and Pedestrian Facilities

Given the rural nature , there are no designated shared-use paths along the Blue Route. However, the conceptual design would not preclude the addition of bicycle amenities. Pedestrian and bicycle amenities will be assessed further, based on the integrated transportation and land use scenarios that are being developed with the communities.

3.3 PINK ROUTE

The Pink Route (Figure 3-2) is a variation of the Blue Route's new roadway. It is primarily south and west of downtown Vergennes, connecting Vermont Route 22A near the Vergennes-Panton municipal boundary (southern terminus) and reconnecting with Vermont Route 22A (south of Route 7) and the Vergennes-Ferrisburgh municipal boundary (northern terminus). This concept includes a new crossing of Otter Creek downstream of the Vergennes Falls and would cross the following roadways: Panton Road, MacDonough Drive, and Botsford Road/Comfort Hill. The overall length of the proposed route is approximately 2.3 miles.

3.3.1 Horizontal Alignment

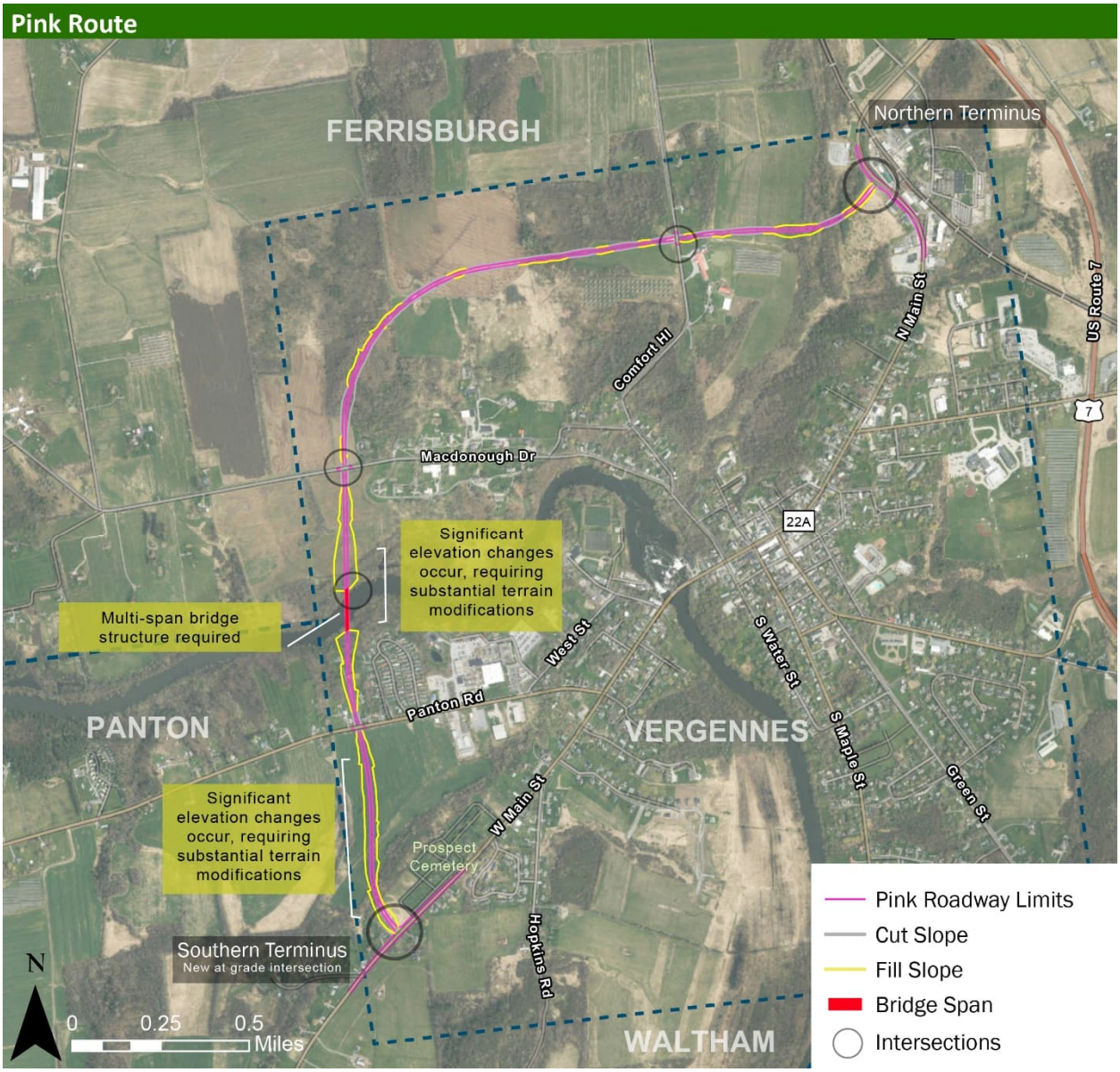
The Pink Route southern terminus intersects with Route 22A approximately 0.75 miles south of the Panton Road and Route 22A intersection. The route proceeds in a north-south direction crossing Panton Road and MacDonough Drive. It is within this segment where the Blue and Pink Routes differ, with the Pink Route being further east and potentially staying within Vergennes city limits. The other key difference between the two routes is the bridge crossing over Otter Creek. Compared to the Blue Route, the Pink Route would require a longer multiple-span structure. The pier locations would be determined in coordination with the U.S. Coast Guard, due to the navigable waterway. North of MacDonough Drive, the alignment of the Pink Route is identical to the Blue Route, proceeding east-west and crossing Comfort Hill. The northern terminus of the Pink Route intersects with Route 22A approximately 0.5 mile west of the Route 22A/Route 7 intersection north of downtown Vergennes, near the police station.

The Pink Route adjusts the southern terminus to be approximately half a mile further north, near the southern end of the Prospect cemetery along Route 22A. Along with shortening the overall length of the route, it avoids constructing a roadway behind the residences in the vicinity of Sunset Knoll Road.

3.3.2 Vertical Alignment

The profile for the Pink Route was established to closely match existing terrain to the most practical extent possible. There are two notable areas where significant elevation changes occur, requiring substantial terrain modifications. These are at the approach to the Route 22A intersection at the southerly limits and at the proposed Otter Creek bridge crossing. The profile is based on achieving a 50-foot minimum vertical clearance over the navigable portion of Otter Creek, and this requirement results in significant fill depths along approximately 1500 feet of roadway, from Station 152+00 to 157+00 on the south side of the bridge and from Station 161+00 to Station 171+00 on the north side.

Figure 3-2 Pink Route Conceptual Engineering Details



3.3.3 Intersections

The Pink Route would include the construction of at-grade intersections with Route 22A. For the purpose of this exercise the intersections were assumed to be either stop controlled or signalized. Future traffic analysis with anticipated truck volumes will allow the project team to pick the appropriate traffic control. To facilitate turning movements, Route 22A would be widened to provide designated turn lanes. A roundabout may also be considered with the advantage of not requiring the addition of designated turn lanes on Route 22A. Intersections with Panton Road, MacDonough Drive, and Comfort Hill would likely be at-grade and would provide additional opportunities for local and regional traffic on Panton Road, MacDonough Drive, and Comfort Hill, and additional access to and from Route 22A.

3.3.4 Bicycle and Pedestrian Facilities

Given the rural nature and existing traffic volumes, there are no designated shared-use paths along the Pink Route. However, the conceptual design would not preclude the addition of bicycle amenities. Pedestrian and bicycle amenities will be assessed further, based on the integrated transportation and land use scenarios that are being developed with the communities.

3.4 ORANGE ROUTE

The Orange Route (Figure 3-3) includes the construction of a new roadway that is approximately 1 mile long, generally parallel to Route 22A, entirely within Vergennes, and in proximity to downtown. The southern terminus of this route is located at the existing intersection of Route 22A and MacDonough Drive. The southern segment of the Orange Route would encompass the existing footprint of MacDonough Drive, with the new roadway portion diverging north in the vicinity of the intersection of MacDonough Drive and Comfort Hill. Traveling north from MacDonough Drive, the new roadway portion of this concept generally parallels Route 22A and reconnects with Route 22A south of the Vergennes-Ferrisburgh municipal boundary in Vergennes.

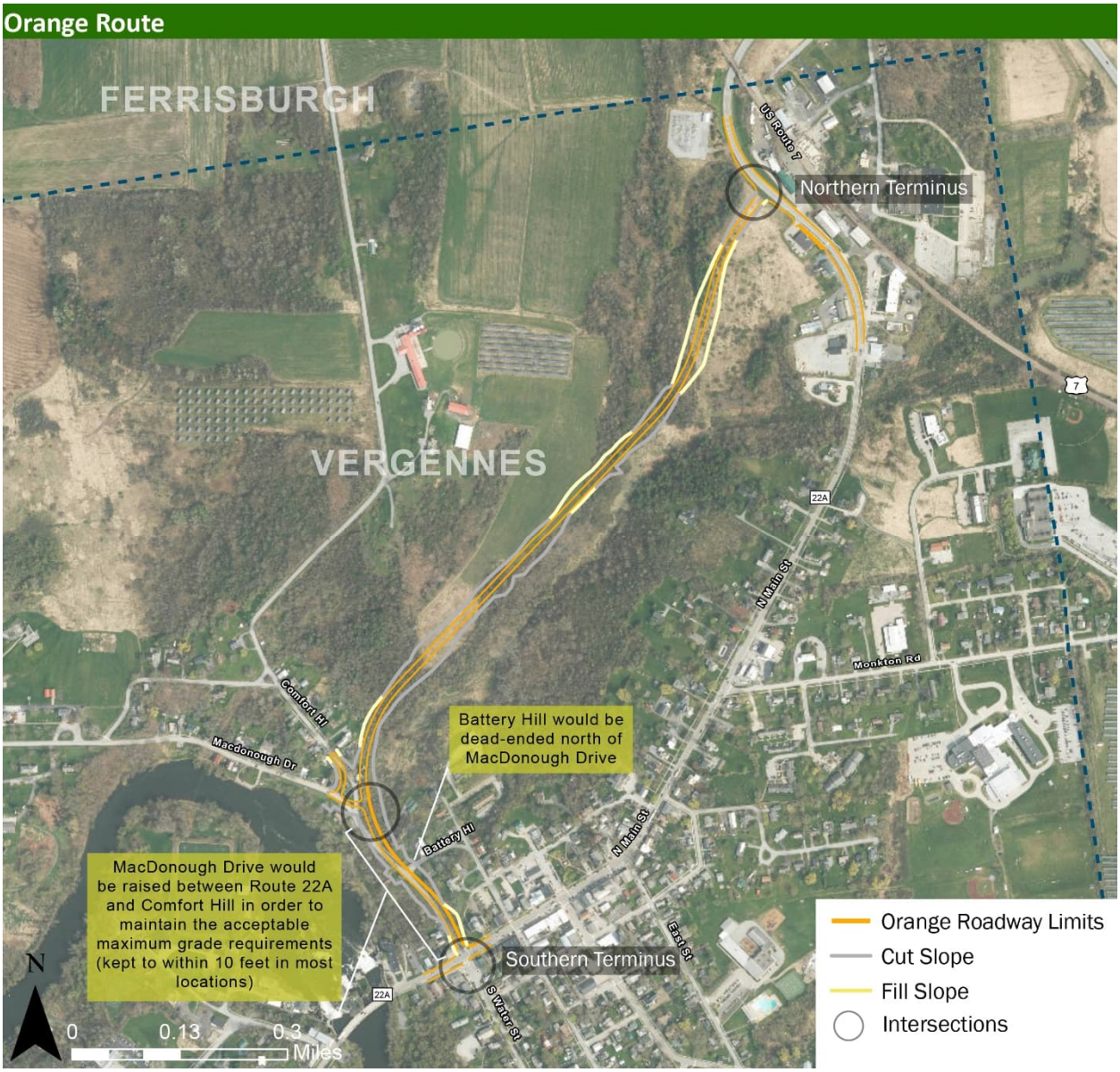
3.4.1 Horizontal Alignment

This Orange Route shares the same northern terminus intersection with Route 22A as the Blue and Pink Routes. The southern terminus of the Orange Route is located at the existing intersection of MacDonough Drive with Route 22A. The route follows MacDonough Drive between the intersection with Route 22A and Comfort Hill with the remainder of the proposed route along undeveloped land between Comfort Hill and the northern intersection terminus. This route alternative includes a realignment of MacDonough Drive between Route 22A and Comfort Hill, as well as a new intersection of MacDonough Drive and Comfort Hill.

3.4.2 Vertical Alignment

While the southern portion of the Orange Route generally follows the existing MacDonough Drive footprint, vertically MacDonough Drive must be raised substantially higher between Route 22A and Comfort Hill in order to maintain the proposed profile within acceptable maximum grade requirements. As a result, the elevation of the Orange Route at the proposed MacDonough Drive intersection with the new roadway is significantly above the existing elevation of the MacDonough Drive and Comfort Hill intersection. Further, the proposed grade at this intersection will result in a profile adjustment to MacDonough Drive and Comfort Hill. The profile of the segment north of this intersection has been established to balance cuts and fills with deviations from existing grade (kept to within 10 feet in most locations). The proposed elevation near the intersection of MacDonough Drive and Battery Hill is approximately 10 feet above the existing elevation. Given these conditions, Battery Hill would be dead-ended north of MacDonough Drive to avoid substantial impacts associated with reconstructing the intersection to meet the proposed Orange Route.

Figure 3-3 Orange Route Conceptual Engineering Details



3.4.3 Intersections

The southern terminus of the Orange Route generally overlaps with the existing intersection of MacDonough Drive and Route 22A. At this intersection, impacts include widening and shifting the intersection easterly, widening and realigning Route 22A to accommodate turn lanes, and the elimination of some on-street parking in front of the Bixby Memorial Library. Additional fill would be necessary to maintain existing grades at the intersection, extending west along MacDonough Drive.

The existing MacDonough Drive and Comfort Hill intersection will require realignment of MacDonough Drive to create a new intersection with the new section of the Orange Route as well as an intersection just to the west connecting MacDonough Drive with the realigned Comfort Hill. At each of these

intersections, substantial fill and grading would be necessary to meet state or local roadway design requirements.

The northern terminus of the Orange Route is a new intersection with Route 22A approximately 200-feet north of the Vergennes Police Department. This is the same location as the proposed northern terminus of the Blue and Pink Routes. To accommodate turn lanes at this intersection, a widening of Route 22A north and south of the proposed intersection would be required.

3.4.4 Bicycle and Pedestrian Facilities

Existing sidewalks along MacDonough Drive northbound and Comfort Hill northbound would be maintained along the realigned MacDonough Drive and Comfort Hill. Sidewalk along Battery Hill southbound connects to MacDonough Drive. While Battery Hill would be dead-ended at MacDonough Drive under this alternative, it is feasible that a sidewalk realignment could maintain the existing pedestrian connection with MacDonough Drive.

Given the proximity of the Orange Route to Downtown Vergennes, bicycle accommodations could be accommodated within the 6-foot roadway shoulder. A designated bicycle lane could also be added to the design, which would increase the right-of—way..

3.5 GREEN ROUTE

The Green Route (Figure 3-4) is an approximately 2.3-mile new roadway located primarily south and east of Vergennes within Panton, Waltham, Vergennes, and Ferrisburgh. The southern terminus of the concept would connect to Route 22A approximately one mile south of the Vergennes-Panton municipal boundary and the northern terminus of the concept would connect to U.S. Route 7 at the existing intersection with New Haven Road in Ferrisburgh. The new roadway would intersect with several existing roadways, including Hopkins Road, Maple Street, Green Street, and Church Street, and cross Otter Creek in the vicinity of the Panton-Waltham municipal boundary upstream of the Vergennes Falls.

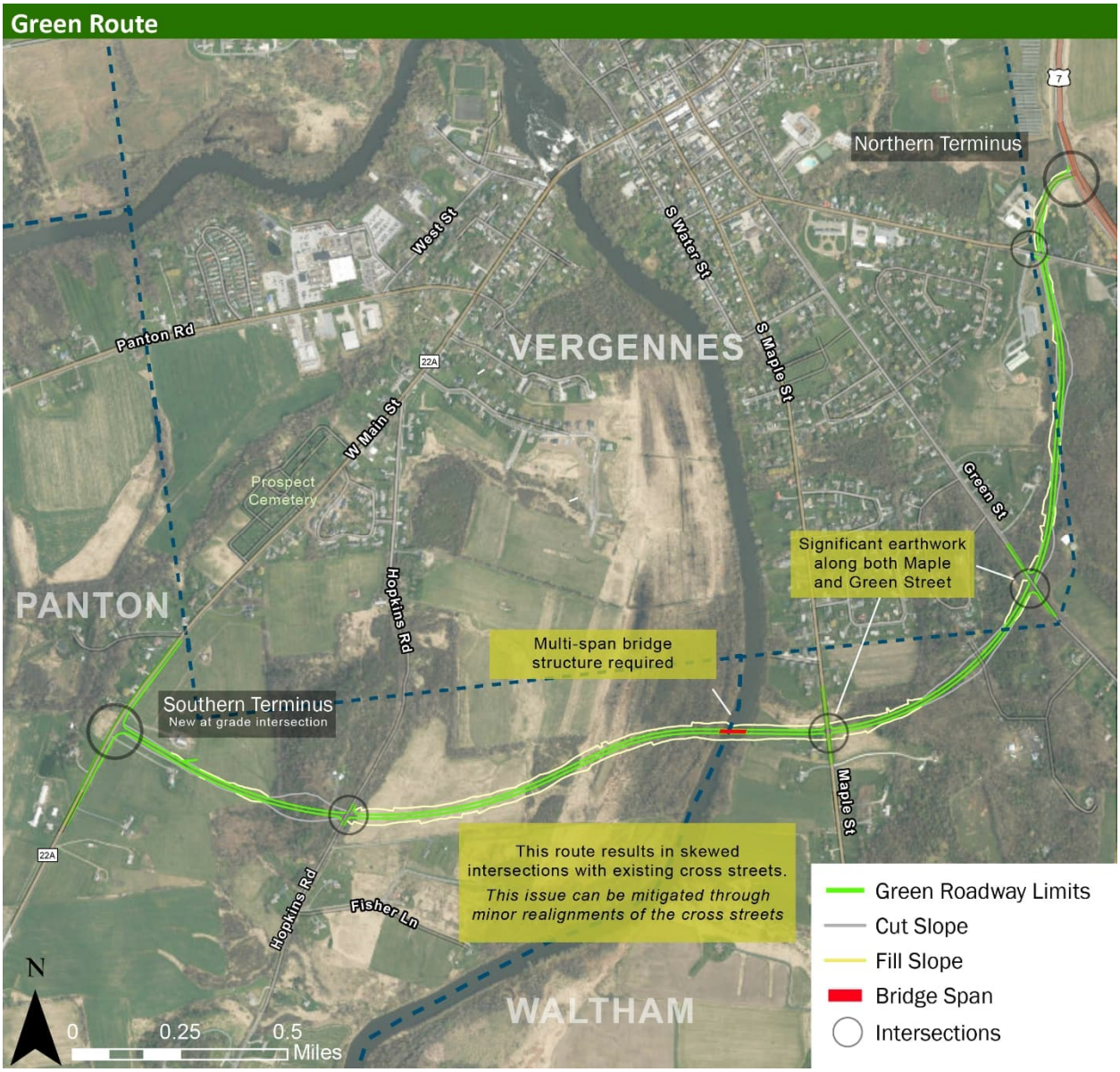
3.5.1 Horizontal Alignment

This southern terminus of the Green Route connects with Route 22A and proceeds in a generally northeast-southwest direction, with its northern terminus located at the existing intersection of U.S. Route 7 and New Haven Road. The southern portion of this route primarily traverses undeveloped parcels and farmland, while the northern portion of the route is proximate to developed residential or commercial parcels.

3.5.2 Vertical Alignment

The existing terrain along this alignment is characterized by high terrain at the proposed southern terminus intersection with Route 22A, in the area just west of Hopkins Road, and in the vicinity of the Green Street intersection. Low terrain is evident in the area to the east of Hopkins Road to Maple Street, which includes the crossing of Otter Creek. With the existing elevation due to a generally rolling terrain, as well as Otter Creek, and given the proposed profile maximum grade limits, there are substantial excavation and fill depths along the Green Route. This also necessitates fairly significant earthwork along both Maple and Green Streets.

Figure 3-4 Green Route Conceptual Engineering Details



3.5.3 Intersections

Four new intersections are created along the Green Route, including one relocated intersection (Church Street) and one maintained in its current configuration (Route 7). A new at-grade intersection at the route's southern terminus with Route 22A would provide access to/from the Green Route. A designated right-turn (northbound) lane onto the Green Route would necessitate a widening of Route 22A. Intersections with Hopkins Road and Maple, Green, and Church Streets would also be at-grade. The alignment of this route results in skewed intersections with existing cross streets. However, this issue can be mitigated through minor realignments of the cross streets. The existing New Haven Road and Church Street intersection would be relocated further east to form the new intersection with the Green Route. The northern terminus of this route is located at the existing intersection of U.S. 7 and New Haven Road. This intersection may require a modification of the existing lane configuration or signalization based on

increased traffic volumes associated with the Green Route. Any modification to this intersection may necessitate advance signage or warning given the grade of U.S. 7 northbound within this segment.

3.5.4 Bicycle and Pedestrian Facilities

While a shared-use path has not yet been designated along this proposed corridor, recreational bicycle circulation within the region would be enhanced through bicycle-compatible shoulders or a dedicated side-path. Currently, no elements of the proposed design would preclude either facility.

3.6 PURPLE ROUTE

The Purple Route would shift northbound truck traffic currently using Route 22A to Route 17 and Route 7, maintaining southbound truck trips on Route 22A through Vergennes. This concept would generally utilize existing roadways with targeted improvements, including widened shoulders and travel lanes, roadway profile changes, and intersection improvements along the existing roadway. The Purple Route would result in an approximately 5-mile detour for northbound truck trips when compared to existing trips along Route 22A (12.7 miles versus 7.4 miles). Proposed improvements are anticipated to primarily occur along Route 17, which comprises approximately 7.3 miles of the total length of the northbound route.

3.6.1 Horizontal Alignment

The existing 7.3-mile segment of Route 17 within the Purple Route contains several substandard curves from a geometric design perspective given the anticipated design speed and volume of truck traffic. Realignment of the roadway to flatten the curves to a larger radius is anticipated. Locations where realignment would be necessary to meet the standard are identified on the Purple Route Plans and listed below:

- Approximately 2700 feet east of Mountain Road (Stations 2068+00 – 2075+00)
- Between Weybridge Road and Quaker Village Road (Stations 2157+00 – 2162+00)
- Approximately 1600 feet east of Quaker Village Road (Stations 2180+00 – 2183+00)
- Approximately 2400 feet east of Field Days Road (Stations 2224+00 – 2230+00)
- Approximately 2200 feet west of Green Street/Pearson Road (Stations 2283+00 – 2289+00)

3.6.2 Vertical Alignment

The existing profile of Route 17 within the Purple Route is characterized by rolling terrain containing numerous substandard sections in terms of profile grade and stopping sight distance. Modifying the profile would involve lessening steep grades to acceptable levels and revising vertical curves to improve sight distances.

While the horizontal improvements for this roadway can be considered “spot” improvements, vertical revisions would extend beyond the deficient area – even into areas that are not necessarily deficient. To identify the limits of reconstruction a preliminary proposed profile has been developed and is included in the attachments. Based on the profile improvements, approximately 3.2 miles would be considered reconstruction with the remaining 4.1 miles less extensive, consisting of widening, roadside grading, and minor profile adjustments. The approximate locations for each are listed below:

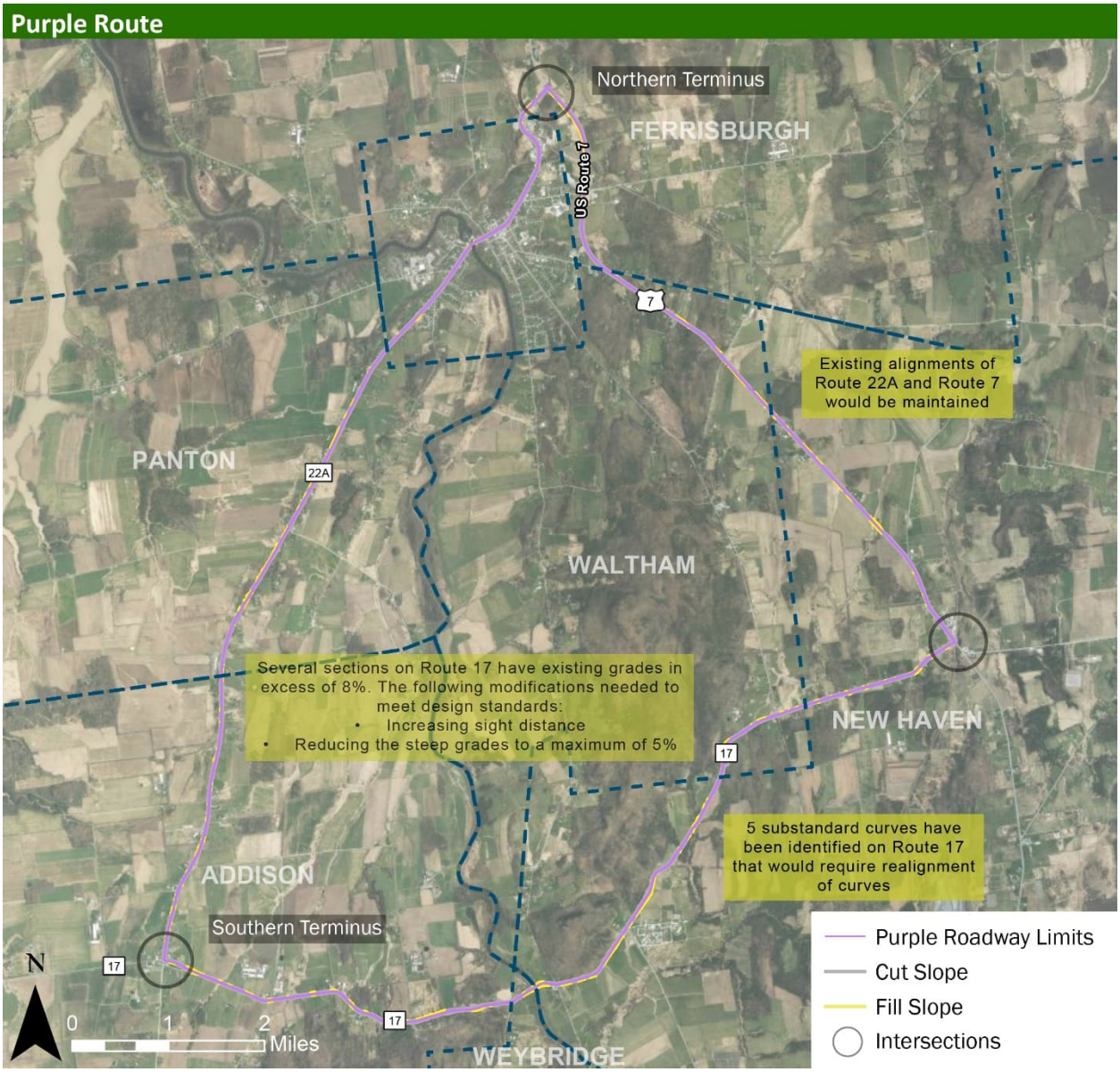
Complete Reconstruction:

- Beginning 300 feet east of Route 22A and ending 1300 feet west of Mountain Road/Middle Road (Stations 2003+00 to 2032+00)
- Beginning 600 feet east of Mountain Road/Middle Road and ending 1500 feet west of Valley View Drive/Otter Creek Road (Stations 2050+00 to 2090+00)
- Beginning 600 feet east of Valley View Drive/Otter Creek Road and ending 1200 feet west of Weybridge Road (Stations 2111+00 to 2133+00)
- Beginning at Weybridge Road and ending at the Otter Creek bridge (Stations 2145+00 to 2155+00)
- Beginning 300 feet east of the Otter Creek bridge and ending 1200 feet east of Quaker Village Road (Stations 2160+00 to 2177+00)
- Beginning at Fair View Lane and ending 1300 feet west of Pearson Road (Stations 2227+00 to 2297+00)
- Beginning at Pearson Road and ending 100 feet east of Nancy Lane (Stations 2313+00 to 2344+00)
- Beginning 600 feet west of Daniels Road and ending at Route 7 (Stations 2360+00 to 2387+00)

Partial reconstruction/Widening:

- Beginning 1300 feet west of Mountain Road/Middle Road and ending 500 feet east of Mountain Road/Middle Road (Stations 2032+00 to 2050+00)
- Beginning 1500 feet west of Valley View Drive/Otter Creek Road and ending 600 feet east of Valley View Dr/Otter Creek Road (Stations 2090+00 – 2111+00)
- Beginning 1200 feet west of Weybridge Road and ending at Weybridge Road (Stations 2133+00 to 2145+00)
- Between Otter Creek bridge and Weybridge Road (Stations 2158+00 to 2160+00)
- Beginning 1200 feet east of Quaker Village Road and ending at Fair View Lane (Stations 2177+00 to 2227+00)
- Beginning 1300 feet west of Pearson Road and ending at Pearson Road (Stations 2297+00 to 2313+00)
- Beginning 100 feet east of Nancy Lane and ending 600 feet west of Daniels Road (Stations 2344+00 to 2360+00)

Figure 3-5 Purple Route Conceptual Engineering Details



3.6.3 Intersections

The Purple Route would follow the existing alignment of Route 7, Route 17, and Route 22A and would not create any new intersections. Existing intersections would be improved to accommodate additional truck traffic. The need for improvements will be identified later in the study once a level-of-service analysis is performed using future truck volumes.

3.6.4 Bicycle and Pedestrian Facilities

While a shared-use path has not yet been designated along this proposed corridor, recreational bicycle circulation within the region would be enhanced through bicycle-compatible shoulders or a dedicated side-path.

4. Agency Coordination and Public Involvement

VTrans and ACRPC are committed to involving federal, state, and local agencies and the public throughout the Vergennes PEL Study process. The Vergennes PEL Study aims to reach consensus among stakeholders for the vision of transportation solutions on Route 22A, building upon past studies and projects in the area. Stakeholder involvement is emphasized throughout the PEL process and feedback has and will continue to be solicited from federal, state, and local agencies and the public at key decision points to foster consensus on recommendations.

4.1 TECHNICAL COMMITTEE

The Technical Committee consists of subject matter experts that review and verify the scope of work, methods, and assumptions used by the consultants to carry out the study as well as any resulting recommendations. The Technical Committee's role is to ensure that the Policy Committee has reliable information on which to base its findings and decisions. Membership includes VTrans planning, highway safety and design, structures, bicycle and pedestrian, and environmental staff; ACRPC and municipal land use planners; FHWA staff; municipal public works and road supervisors; and economic development specialists.

In advance of future environmental reviews and to inform the NEPA process that may follow this study, an Agency Coordination Plan was developed to define the roles and guide coordination activities with state and federal agencies who may be cooperating and participating under NEPA in future environmental reviews. State and federal agencies are invited to the Technical Committee meetings to review and provide input.

A joint Technical Committee and federal and state agency partner meeting was held on June 21, 2023, to review the draft conceptual plans. Following the meeting, questions and comments on the conceptual plans were accepted through July 10. This memo was discussed at the December 5, 2023 Technical Committee and federal and state agency partner meeting where its findings where accepted.

4.2 POLICY COMMITTEE

The Policy Committee is charged with endorsing the findings in the PEL and making recommendations to VTrans on study planning decisions (e.g., purpose and need statement, initial short-list of concepts, and this design memorandum) that would be carried forward into a future environmental review. The Policy Committee functions as a body with wide knowledge that can speak on behalf of many communities impacted by this study and will consider recommendations from the Technical Committee in its decision-making process. It consists of representatives from the seven municipalities potentially affected by the PEL Study (Addison, Ferrisburgh, Panton, New Haven, Vergennes, Waltham, and Weybridge), VTrans, and other stakeholders representing the region, environment, and economy.

A Policy Committee meeting was held on January 22, 2024, to review the draft conceptual plans. Following the meeting, questions and comments on the conceptual plans were accepted through January 31. This memo was discussed at the January 22, 2024 Policy Committee meeting where its findings where accepted.

4.3 ONLINE SURVEY

VTrans, in partnership with ACRPC, launched an online survey August 14 to September 26, 2023 to help the study team better understand the issues that are important to the public. The survey allowed the public to provide comments on the transportation solutions being evaluated including new roadways, improvements to existing roadways, and an option where traffic flow does not change. The public survey was available on the Vergennes PEL Study website and in paper format. The survey was promoted through in-person events, emails to a stakeholder distribution list, social media posts by the Vermont Agency of Transportation, and direct outreach to municipalities and local organizations who shared it with their contacts.

There were 903 responses to the public survey, including 901 responses submitted through the online platform and two responses submitted as paper surveys. Survey respondents were older than the general population on of the study area, with the largest group of respondents over the age of 65 (32%). The survey received the smallest number of responses from those aged 17-24 (1%). About one-third of respondents either lived (34%) or worked (30%) in Vergennes and 12% of respondents lived outside the study area. Based on population data from the 2020 Census, survey respondents overrepresent the resident populations of Vergennes, Panton, and Waltham, and they underrepresent the resident populations of Ferrisburgh, Addison, New Haven, and Weybridge.

Full results from the Online Survey are available on the study website (https://vergennespel.com/).

4.3.1 Key Findings from the Survey

Route Options

The route option with the highest or most favorable average rating among survey respondents was the Blue Route (rated 3.32 out of 5) followed by the Pink Route (3.24). The Orange Route had the lowest average rating (1.87), while the Purple Route, Green Route, and No Build options were rated in the middle (2.29, 2.43, and 2.48 respectively.)

Truck Traffic Preferences

Survey respondents were asked about their land use preferences in three areas that would be affected by a new route. Respondents provided their preference for keeping land use as it is today, adding more housing, and adding more commercial or industrial land use. Overall, respondents preferred to add housing in all locations, and to add commercial or industrial land use around a new route intersection with Route 22A, but these opinions were not unanimous and in some cases they appeared to be slight preferences rather than strong preferences by many people.

Truck Traffic Preferences

Survey respondents were asked about their preferences related to truck traffic through two trade-off questions. The first question asked, if moving trucks also means moving passenger vehicles, would respondents prefer to keep all traffic on Route 22A/Main Street (representing the No Build option) or to shift all traffic to a new roadway (Blue, Pink, Green, or Orange routes). Overall, survey respondents were willing to accept shifting both truck and passenger vehicle traffic away from Route 22A/Main Street to a new roadway or an improved Route 17. The second question focused on truck traffic only and asked if respondents preferred to keep existing truck traffic on Route 22A/Main Street (representing the No Build option) or to shift northbound truck traffic to an improved Route 17 (Purple Route). Respondents had a strong preference for shifting northbound truck traffic to an improved Route 17 (Purple Route) compared to keeping existing truck traffic on Route 22A/Main Street in Vergennes.

Themes from Open-Ended Comments

Respondents had the opportunity to leave open-ended comments on each screen of the survey. There were 2,119 received in total. These comments were coded by sentiment (positive, negative, or neutral), theme (e.g., noise, traffic congestion), route option, and impact area (e.g., a specific street or municipality). The majority of these comments (63%) were negative in sentiment. The routes receiving the highest proportion of positive comments were the Blue Route (41%), Pink Route (40%), while the Orange Route (8%), Green Route (14%), No Build option (21%), and Purple Route (27%) received the lowest proportion of positive comments. These results align with the ratings of route options collected on screen 2 of the survey.

Over 100 comments referred to the impacts of the green route on residents and residential areas. The Purple and Orange routes received a relatively high number of comments related to safety and circulation of trucks, road geometry (alignment, grade, width, lanes), and traffic congestion. Comments about businesses / economic vitality and noise were relatively evenly distributed across the route options.

4.4 LOCAL EVENTS AND OTHER CONVERSATIONS

Members of the study team attended the 75th anniversary of Vermont's largest agricultural fair, Addison County Fair & Field Days—held over five days from Tuesday, August 8, through the following Saturday

and had direct engagements with 120 individuals.

These direct engagements ranged from brief conversations about the purpose of the PEL Study to lengthy discussions about alternative truck routes, the need for those routes, and the general condition of VT 22A.

Those engaged represented all of the PEL Study communities as well as Bridport, Shoreham, Middlebury, Bristol, Salisbury, Leicester, Lincoln, Goshen, Whiting, Shelburne, Charlotte, Burlington, Hinesburg, and Milton. The common thread running through all of these conversations was deep concern about the safety of VT 22A, from its intersection with Route 4 in Fair Haven up to its termination at Route 7 in Ferrisburgh. Residents of Vergennes noted the impact of 24/7 truck traffic on their quality of life. The poor condition of the roadway was also a constant theme.

Of those of those who took a close look at the routes under study and favored the Green Route, noted that would be the least intrusive and least expensive of the routes under study. One individual pointed to the Orange Route as preferable because it does not require construction of a bridge. A few individuals asked about improvements to bike-ped mobility.

Vergennes Day took place on Saturday, August 26, and was a great success for the public outreach efforts of the Study team. Many were from Vergennes, but the event drew from all over northern Addison County and included out-of-state visitors as well. Awareness of the PEL Study and the public survey was high and many of those who stopped by the booth noted they had already filled out the survey, which had only just been released. Unlike Field Days, where most engagements were relatively short, the team had many lengthy discussions with locals.

5. Next Steps

The study team will use the conceptual designs identified in this technical memorandum to develop integrated transportation/land use concepts. To support this effort, land use visioning workshops, anticipated for December 2023 and January 2024, will be conducted. The visioning workshops will help bring the study area communities together to decide on future priorities and coordinate land use and transportation planning goals.

The integrated transportation concepts will then be evaluated and compared, in conjunction with additional public and agency feedback. The evaluation will help the study team and the Technical and Policy Committees identify a reasonable range of alternatives to be advanced to the subsequent NEPA review. The final step of the PEL Study will be to prepare an Implementation Plan. The Implementation Plan will include an overview of the immediate next actions for VTrans to initiate the NEPA process.